



# The Effect of Preoperative Education on Preoperative Anxiety in Patients Waiting for Surgery: A literature Review

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## Abstract

**Context:** Among patients undergoing surgery, preoperative anxiety (PA) is one of the most common psychological problems that can negatively impact the patient's physical health and the operation's outcome. Preoperative patient education (PPE) is a way to reduce PA, which has many advantages over pharmaceutical methods. Therefore, this study aimed to evaluate the effectiveness of PPE on PA in patients who are candidates for surgery by reviewing similar previous studies.

**Evidence Acquisition:** The data in this narrative review were collected by searching past studies in reliable international databases, including Web of Science, Science Direct, Scopus, PubMed, and Google Scholar, in the last two decades. In the first stage of the search, 248 articles and scientific reports were received, and then 30 articles were selected as final studies by considering the inclusion and exclusion criteria.

**Results:** In most previous similar studies, PPE significantly reduced PA in patients who are candidates for surgery. However, the findings of a small number of studies also showed that PPE had little positive effect, no effect, or negative effect on PA control. There were different methods to provide information to patients before surgery, and the efficiency and application of each were different based on the demographic characteristics of the patients.

**Conclusions:** Based on the findings, appropriate training methods can reduce the level of PA in patients who are candidates for surgery. However, in some past studies, providing information about the surgical procedure may increase patients' PA. Therefore, nurses or medical staff with more contact with patients are suggested to have sufficient experience and knowledge in providing information and choosing the training method for patients before surgery.

**Keywords:** Surgery, Preoperative Anxiety, Preoperative Education, Patients

## 1. Context

Surgery is a type of traumatic interventional treatment usually associated with pain and bleeding, causing a state of psychological disturbance, namely anxiety (stress and depression), especially when these surgeries are essential interventions to save a person's life from a dangerous disease such as cancer (1, 2). Surgical interventions shock the patient and his family and lead to anxiety and stress. The appearance of anxiety in patients who are candidates for surgery is a prevalent thing because surgery of any kind is considered an anxiety-provoking experience and threatens the integrity of the body and sometimes the whole life of the patient (3, 4).

Humans experience anxiety in life, and it is natural to feel anxious when faced with threatening or stressful situations, but chronic and severe anxiety without a

clear cause is uncommon. Anxiety includes feelings of uncertainty, helplessness, and physiological arousal as a distressing mental state or a feeling of helplessness related to a threatening situation or anticipation of an unknown threat to oneself or others. In addition, anxiety is the most common feeling that all humans experience (5). An individual's life can change in many ways, which can create anxiety and stress, and surgery is one of those factors (6). Previous research has shown that more than 60% of patients who are candidates for surgery and their families are anxious about surgery and anesthesia (4, 7-9).

Preoperative anxiety (PA) is a normal feeling, but even when a person knows that surgery will restore his health or save his life from certain death, many people do not feel comfortable with surgery (10, 11). Nigussie et al. reported that two-thirds of their research samples, which

included 239 surgical candidate patients, had anxiety before surgery (12). Nazari-Vanani and Rahimi-Madiseh showed that surgical candidate patients had high anxiety (13). Anxiety before surgery stimulates the sympathetic, parasympathetic, and endocrine systems, which leads to an increase in heart rate, blood pressure, and heart excitability and, as a result, causes arrhythmia. The extent and growth of the period of anxiety can lead to increased protein breakdown, reduced wound healing and immune response, increased risk of infection, and water and electrolyte imbalance (13).

Pain after surgery is still a clinical challenge for nurses caring for patients, which may be even more significant for patients who manage their pain after discharge from the hospital. Pain after surgery is acute due to tissue damage, inflammation, and healing (14). Most patients report pain after surgery, but the amount of pain depends on the type of surgery, previous experience with pain, age, sex, and expectations of the patient (15). The complexity of the mentioned factors makes it difficult to predict the amount of pain the patient will experience and how much the pain will be bearable. Inadequate evaluation and management of postoperative pain may cause anxiety, insomnia, increased stress, and limited mobility (16). Influential factors in pain control include poor communication between the patient and care providers, unrealistic patient expectations, and lack of proper patient education (17). Consequences of inadequate pain control can lead to negative outcomes such as progression of chronic pain, deep vein thrombosis, atelectasis, and delay in resuming normal daily activities and work activities (18).

Efforts to increase patient awareness of pain and analgesic options may increase the likelihood of achieving optimal postoperative pain control (14-18). In addition, the use of pharmaceutical methods to reduce preoperative anxiety may disrupt the surgical process in some cases, so researchers and surgeons have a great desire to use non-pharmacological methods to reduce their anxiety (11, 19, 20). There was no relevant review study on the topic under discussion. Considering the high importance of preoperative anxiety in patients who are candidates for surgery, this review study aimed to evaluate the effect of preoperative education on the above two critical variables in patients who are candidates for surgery.

## 2. Evidence Acquisition

The data of this narrative review were collected by evaluating the results of past studies. Previous studies in the last two decades were collected by searching the relevant MeSH (Medical Subject Headings) Terms in international authoritative databases, including Web of

Science, Science Direct, Scopus, PubMed, and Google Scholar. In the first stage of the search, 248 articles and scientific reports were received, and then 30 articles were selected as final studies by considering the inclusion and exclusion criteria. Exclusion criteria in the selection of final studies included the absence of an article with complete structure, reports published in non-reputable journals, studies with low sample size, and studies outside the scope of the main objective of the present study.

## 3. Results

Any type of surgery is considered an anxiety-inducing experience because it is considered a threat to the integrity of the body and sometimes a threat to life (21). Most patients experience PA (3, 4, 7), which includes 11 to 80% of adults (22). Anxiety is a vague feeling, worry, discomfort, or apprehension (5), which is often due to being in an unfamiliar situation, a sense of danger of death (23), discomfort, fear of pain after surgery, changes in the shape or actions of the body, increased dependence, worrying about the family. Being or potential changes in the way of life are created. The fear of pain after surgery is one of the first factors known to cause anxiety (1-6). Anxiety begins when the patient becomes aware of the need for surgical treatment and reaches its peak during hospitalization (23). The symptoms in patients before surgery vary from person to person. As a result of anxiety, the level of cortisol and adrenaline increases, which is a physiological stress response.

Anxiety has a negative effect on recovery and tissue repair. In addition, spending a lot of mental and physical energy during anxiety can lead to patient fatigue and cause a series of biochemical activities in the body that stimulate the autonomic system and muscle tension and increase the production of corticosteroids (24-26). Anxiety, by stimulating the sympathetic system, leads to an increase in the number of heartbeats, an increase in blood pressure, a decrease in blood supply to the wound, a contraction of arterial vessels, and a decrease in the relative pressure of tissues (27). When anxiety is not controlled or prolonged, it may lead to increased protein breakdown, reduced wound healing, increased risk of infection, altered immune response, and electrolyte and fluid imbalance, as well as changes in sleep patterns (24-26). These factors prolong the hospitalization time and delay the discharge of patients (28). In addition, the presence of anxiety during the pre-surgery period causes stomach ulcers (29) and decreases patients' satisfaction with the treatment and nursing care (22).

Since nurses in clinical centers spend more time with patients after surgery compared to other members of

the treatment team, for this reason, they are in the best position to relieve anxiety better and can easily use non-pharmacological treatments to reduce use anxiety (30). Today, drug therapy methods such as sedatives are commonly used to reduce anxiety during surgery, which often have unwanted side effects such as nausea and immune system suppression (28). Patients who suffer from drug side effects and other harmful effects should have access to a non-drug treatment option (31). Providing non-pharmacological measures by nurses can relieve anxiety, which is usually less dangerous for patients and leads to discontinuation or reduction of drug use (30).

Knowing what will happen during surgery can alleviate some of the anxiety and worry caused by unknown factors. Nursing interventions to relieve anxiety do not conflict with medical standards, and one of these methods is training patients (32, 33). Nurses are morally obligated to educate their patients as part of their professional work, forcing them to provide patients and their families with the necessary information (33). On the other hand, in many cases, the lack of awareness and fear of surgical incision pain is one of the nursing diagnoses before surgery. Therefore, nurses cannot separate patient education from intervention programs (34). Information about pain, like other nursing measures, should be designed in the patient's care plan and evaluated after use. The anxiety caused by the fear of pain after surgery is reduced, and the patient recovers faster with a correct understanding of pain and its control by the patient (35). Leinonen and Leino-Kilpi indicated that nursing intervention before surgery improves the patient's condition in terms of pain and anxiety. In their study's "conclusion" section, more research should be performed on pain treatment, anxiety reduction, patient education, and care costs in the pre-and post-surgery stages (36).

Patients frequently need to be informed about factors related to anxiety, such as pain and symptoms after surgery (37). In this regard, various research has been conducted to evaluate the effectiveness of different educational methods for PA management (Table 1). Lin and Wang also showed research that patient education about pain after surgery reduces PA (35). Belleau et al. examined the effect of an educational intervention on the anxiety of women waiting for mastectomy in Canada and showed that the anxiety level of the patients in the test group was significantly lower than the control group after the intervention ( $P < 0.001$ ) (38). In addition, the results of Morrell on the effect of preoperative structured training on the anxiety level of cataract surgery candidates revealed that Preoperative patient education (PPE) significantly reduced the anxiety level of cataract surgery patients ( $P < 0.01$ ) (39). Another similar study by Zakerimoghadam

et al. aimed to evaluate the effect of PPE on reducing PA. The findings of the study above showed that the anxiety level before the intervention between the test group and the control group did not have a significant difference, but the anxiety level in the test group was significantly lower than the control group after the intervention ( $P < 0.001$ ) (40). Malmir et al. assessed the role of Benson's relaxation in reducing state anxiety in open-heart surgery patient candidates and showed that Benson's relaxation training significantly reduced the anxiety level of open-heart surgery candidates ( $P < 0.05$ ) (41).

Some researchers evaluated the effectiveness of different training methods to reduce PA. Nikbakht Nasrabadi et al. (42) and Torabi et al. (43) indicated that Benson's relaxation training causes a significant decrease in PA. Saleh-Moghaddam et al. (44), Ruffinengo et al. (45), and Mousavi et al. (46) reported that showing an educational video has a significant effect on reducing PA. Tou et al. (47) demonstrated that providing two-dimensional animation to patients caused a significant decrease in the PA level of the intervention group. Providing information to patients before surgery in the form of verbal, written, animation, and voice is another method that has caused a significant reduction in PA levels (48, 49). Sayadi et al. (50) concluded that 95% of patients in the intervention group had low levels of anxiety after the intervention (multimedia education). In addition, some other studies have emphasized that face-to-face education significantly reduced PA in candidates for various surgeries (51-53).

In addition, there is research showing that providing information to patients before surgery reduces their anxiety, but some studies have reported that PPE may sensitize patients and cause them to feel more anxiety and pain (56).

Contrary to other studies, Deyirmenjian et al. reported that pre-operative training for open heart surgery candidates is a source of anxiety to the extent, and the level of anxiety in the test group was significantly higher than the control group (54). In addition, Asilioglu and Celik, who evaluated the effect of PPE on the PA of patients undergoing open heart surgery, its findings showed no significant difference regarding anxiety levels between the two test and control groups (55). The results of Baran's study were the opposite and showed that PPE was effective in reducing their anxiety and led to an increase in their anxiety. This inconsistency can be due to factors such as the lack of training with the patient's level of culture and knowledge.

**Table 1.** The Summary of Previous Studies Related to the Application of Preoperative Patient Education (PPE) for Preoperative Anxiety Management

Author(s) and Year	Sample Size	Type of Surgery	Key Findings
Lin and Wang (2005) (35)	Test (30) and control (30)	Abdominal surgery	Findings showed that PPE reduces PA in postoperative pain.
Belleau et al. (2001) (38)	Test (30) and control (30)	Mastectomy	The findings indicated that after the intervention, the anxiety level of patients in the test group was significantly lower than the control group.
Morrell (2001) (39)	Not reported.	Cataract surgery	The findings revealed that PPE had a significant effect in reducing the anxiety level of patients undergoing cataract surgery ( $P < 0.01$ ).
Zakerimoghadam et al. (2009) (40)	Test (44) and control (45)	Abdominal surgery	The findings illustrated that PA before the intervention did not have a significant difference between the test group and the control group, but after the intervention, the anxiety level in the test group was significantly lower than the control group ( $P < 0.001$ ).
Malmir et al. (2015) (41)	Test (45) and control (45)	Open cardiac surgery	The findings demonstrated that Benson's relaxation training significantly reduced the anxiety level of open-heart surgery candidates ( $P < 0.05$ ).
Nikbakht Nasrabadi et al. (2005) (42)	Test (70) [by pretest and posttest design]	Abdominal surgery	The results showed that Benson's relaxation training ( $P < 0.02$ ) and praying ( $P < 0.006$ ) reduced preoperative anxiety. There was no significant difference between the two methods in influencing PA.
Torabi et al. (2013) (43)	Test 1 (30), test 2 (30) and control (30)	Kidney transplantation	Comparing the average PA before the intervention showed no significant difference in the three study groups, including pressure massage, Benson's relaxation, and the control group. The level of PA after the intervention in the two test groups was significantly reduced compared to the control group.
Saleh-Moghaddam (2016) (44)	Test (30) and control (30)	Open heart surgery without a PUMP	The results presented that showing the educational video to patients will significantly reduce their apparent anxiety before surgery.
Ruffinengo et al. (2009) (45)	Test (45) [by pretest and posttest design]	Elective coronarography	The findings stated that the educational film has a significant effect on the satisfaction and anxiety levels of patients undergoing coronary angiography.
Mousavi et al. (2020) (46)	Test 1 (34) and test 2 (34) [by pretest and posttest design]	Bone marrow transplantation	Comparing the effects of face-to-face training (method 1) and training through video presentation (method 2) on patients' anxiety levels showed no significant difference was observed between the effects of the two mentioned methods. In addition, the use of each of the mentioned methods can have a significant impact on reducing the anxiety level of patients.
Tou et al. (2013) (47)	Inaccessibility	Bowel surgery	Providing two-dimensional animation to patients caused a significant decrease in the anxiety level of the intervention group.
Astley et al. (2008) (48)	Test 1 (33), test 2 (33) and test 3 (33)	Coronary angiography	A comparison of the impact of providing verbal (method 1), written (method 2), and animated (method 3) information on the anxiety level of patients showed that no significant difference was observed between the three methods. In addition, the use of any of the mentioned methods can reduce the anxiety level of patients.
Sadeghi et al. (2011) (49)	Test 1 (35), test 2 (35) and control (35)	Various surgery	A comparison of the effects of verbal training (method 1) and audio training (method 2) on patients' anxiety levels showed no significant difference between the effects of the two mentioned methods. In addition, the use of each of the mentioned methods can have a significant effect on reducing the anxiety level of patients.
Sayadi et al. (2018) (50)	Test (44) and control (44)	Cerebral angiography	After the intervention (multimedia education), 95% of the patients in the intervention group and 86.4% of the patients in the control group had low levels of anxiety. After the intervention, the difference in anxiety levels between the two groups was insignificant ( $P > 0.05$ ).
Wongkietkachorn et al. (2018) (51)	Test (225) and control (225)	Various surgery	Face-to-face training significantly reduces P-A decline.
Alanazi (2014) (52)	1752	Various surgery	A review study included fourteen intervention trials (twelve randomized controlled trials and two pre/post-test trials). Eight of fourteen trials showed that preoperative educational intervention significantly reduced PA ( $P < 0.05$ ).
Salahshourian Fard et al. (2018) (53)	Test (40) [by pretest and posttest design]	Brain tumor under stereotaxic biopsy	The study's findings indicated that face-to-face training before surgery caused a significant decrease in PA ( $P = 0.001$ ).
Deyirmenjian et al. (2006) (54)	Test (57) and control (53)	Open cardiac surgery	The findings illustrated that PPE is a source of anxiety for patients who are candidates for open-heart surgery to the extent that the level of anxiety in the test group was significantly higher than the control group.
Asilogliu and Celik (2004) (55)	Test (50) and control (50)	Open cardiac surgery	The findings showed that there was no significant difference in the level of anxiety between the test and control groups.

#### 4. Conclusions

Based on the findings, appropriate training methods can reduce the level of PA in patients who are candidates for surgery. However, some past studies have reported that providing information about the surgical procedure may increase patients' PA. Therefore, nurses or medical staff who have more contact with patients are suggested to have enough experience and knowledge to provide information to patients before surgery. In addition, nurses should choose an appropriate educational method considering the demographic characteristics of patients, which can have a high impact on reducing PA, and pass relevant training courses to gain sufficient experience and knowledge.

#### Footnotes

**Authors' Contribution:** S.S: Presenting the idea, designing the study, writing, and revision the manuscript.

**Conflict of Interests:** Author confirms that there are no competing interests.

**Data Availability:** The dataset presented in the study is available on request from the corresponding author during submission or after publication.

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