



Nursing interventions to reduce preoperative anxiety.

A Literature Review

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Abstract <p>Preoperative anxiety is a common emotional response of patient undergoing surgical treatment. Preoperative anxiety has various negative effects during whole perioperative period. Preoperative anxiety management is a great challenge for the nurses.</p> <p>The aim of the study was to highlight the nursing interventions to reduce pre-operative anxiety through existing literatures. The purpose was to provide evidence-based knowledge to nurses on how to reduce preoperative anxiety of patient during preoperative period.</p> <p>The study was implemented as a literature review. The articles for the study were retrieved from CINAHL and PubMed. The articles were chosen based on research question. Content analysis was applied in the analysis of the data.</p> <p>Ten articles were chosen to be reviewed. Four main categories were identified: Patient information, psychological support, preoperative nursing visit and music therapy.</p> <p>The study found preoperative patient information, preoperative nursing visit, psychological support and music therapy were effective nursing intervention to reduce the preoperative anxiety.</p>		
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1 Introduction

Anxiety is a temporary emotional state characterised by feeling of tension, nervousness, worrisome, sadness and high autonomic nervous system activities which are often associated with stress and have psychological as well as physical effects. Disease, pain, unknown environment and the surgery are sources of anxiety during hospitalisation. (Ebirim & Tobin 2010, 1.)

Pre-operative anxiety is one of the most common emotional responses that a patient can experience when undergoing a surgical treatment. It is usually caused by worries of the unknown and general concern with the risks of operation. (Santos 2014, 149.) According to World Health Organization (2010), Finland has approximately 11,592 inpatient surgical procedure per 100,000 population. The incidence of preoperative anxiety is reported to range from 60 percent to 80 percent in Western Europe population, but some studies shows wider range from 11 percent to 80 percent among adult patients (Bedaso & Ayalew 2019, 18). Among 239 patients 70 percent experienced some degree of anxiety before the operation (Nigussie, Belachew & Wolancho 2014, 67). During pre-operative period patient's sensation of stress increased which contributed to induce "negative trance", an altered state of consciousness (Komolafe, Csernus & Fülöp 2015, 80).

Preoperative anxiety correlates with a high incidence of post-operative pain, delayed recovery and discharge from hospital. In addition, anxiety may influence adversely the induction of anaesthesia and its recovery as well as decrease patient's satisfaction with their peri-operative experience. (Arslan, Özer & Özyurt 2008, 47.)

Preoperative anxiety is a challenge in the preoperative care of patients. During this period, the health care workers with whom patients spend majority of their time in the hospital are preoperative ward nurses and those nurses have the professional relationship with trust. So, the behaviour and professionalism of the nursing staff and their actions have a direct impact on the patient's feelings of anxiety and fears during stressful period. Proper nursing intervention is necessary to the patient during pre-

operative period, but nurses are not fully aware to what extent a patient can cope the anxiety in connection with nursing interventions. (Komolafe et al. 2015, 81.)

2 Pre-operative anxiety

2.1 Definition of anxiety

Everyone experiences anxiety at some level in different phase in their life. Even a mild deviation from the normal life can induced stress. A reaction that frequently occurs and felt by individuals in response to that stress is anxiety. The American Psychological Association defines anxiety as "an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure." Anxiety is a subjective feeling of nervousness, worry and tension. Some extent of anxiety is a normal defence mechanism that motivate people to get the necessary action. For example, lower level of anxiety during exam period will motive an individual to read. On the other hand, excessive amounts of anxiety can cause negative effects on an individual. (Osborn & Sandler 2004, 46-47.)

Heldegard E. Peplau, an American psychiatric, nursing theorist and a nurse, had presented four level of anxiety according to the severity of the patient's presenting symptoms. The initial level, mild anxiety has normal physiological reaction to stressors that have positive affect on individual as described above. In mild anxiety a patient can show symptoms like; irritability, impatience, complaints of slight discomfort behaviours such as nail biting, finger or foot tapping, or fidgeting are typical symptoms of mild anxiety. (Frazier, Moser, Riegel, McKinley, Blakely & Garvin 2002, 57; Disano 2015, 6.)

The next level of anxiety is Moderate anxiety which is manifested in an individual through feelings of tension, worry and nervousness. This increased level of anxiety decreases the ability to solve problem and comprehend information. The individual's ca-

capacity to understand a situation or a specific concept is more limited than in mild anxiety. In moderate anxiety, the patient may show physical symptoms like; muscle tension, diaphoresis, headache, pounding pulse, dry mouth, voice change, frequent urination, increases automatisms. (Videbeck 2014, 50.) The third level, severe anxiety where an individual has feeling of horror or awe. An individual shows difficulty in thinking and reasoning. The person is unable to learn new skills, solve problems and incapable to figure out what is going and present physical symptoms like; worse headache, nausea, vomiting, diarrhoea, withdrawal, threats and demands, dizziness, confusion, insomnia, trembling, tachycardia, hyperventilation, and chest pain. (Disano 2015, 6; Videbeck 2014, 50.)

The last and most intense level of anxiety is known as panic characterized through frightening emotions which can cause an individual to lose control where individual may begin to pace, run, shout, scream or withdraw and shows physical symptoms like; severe hyperactivity or immobility, dilated pupils, severe shakiness, experiences of terror, sleeplessness, severe withdrawal, hallucinations or delusions. (Disano 2015, 6; Videbeck 2014, 50.)

2.2 Preoperative Nursing

Historically perioperative nursing used to refer to operating room nursing but as the responsibilities of the perioperative nurses extended beyond operating room to both preoperative and postoperative, the definition has been changed to refer to responsibilities in all three phases: pre, intra and postoperative phases which has been supported by the Association of Operating Room Nurses (AORN) which formally changed its name to Association of perioperative Registered Nurses. (AORN. (Goodman & Spry 2017, 1-8.) Thus, perioperative nursing is a nursing science that focus with patient's care who are having operative or other invasive procedures.

Surgical experience has been divided into three phase's namely preoperative phase, intraoperative phase and postoperative phase. Among them preoperative phase is

one. This phase begins when the patient or relatives acting on the patient's behalf is informed of the need for procedure and make decision for surgical treatment. Pre-operative phase ends when the patient is transferred to the operating room bed. During preoperative phase nurses must focus on patient support, teaching and preparing the patient psychologically and physiologically for procedure. (Goodman & Spry 2017, 1-8.)

Preoperative nurse's emphasis is to identify high-risk patients and identify and resolve complex medical, aesthetic and social preoperative problems which helps to minimize last-minute cancellation of the procedure. Nurses also help to reduce patient anxiety and meet the learning needs of the patients which may improve the surgical patient's hospital experience. (Turunen, Miettinen, Setälä and Vehviläinen-Julkunen 2017, 915-30.)

2.3 Causes of pre-operative anxiety

Many factors are associated in the development of preoperative anxiety. A study shows that inadequate information from different sources, like television, Internet, newspaper or relatives could lead to misinterpretation and misunderstanding of medical information which in turn increases anxiety level among patients. Patients going under general anaesthetic for a surgery express high level of fear of death and post-operative pain and nausea. (Erkilic, Kesimci, Soykut, Doger, Gumus, & Kanbak 2017, 292-293.)

A study in University of Port-Harcourt Teaching Hospital shows that most of the patients were afraid of harmful mistakes being made during the surgical procedure and not receiving enough attention during the surgical operation. The possibility of having the surgical operation postponed was the most common preoperative worry in patient. (Ebirim & Tobin 2010, 3.)

A research done in Northwest Ethiopia showed that major causes of preoperative anxiety were fear of surgical complication, concerns about family, anxiety of postoperative pain. Other factors like change in environment, fear of physical disability, financial loss, waiting for surgery nil per oral, blood transfusion, stuck with needles and awareness during surgery, past experiences with the surgery were responsible for increase preoperative anxiety. (Mulugeta, Ayana, Sintayehu, Dessie & Zewdu 2018, 155.)

The research done in South Western Ethiopia showed variables like marital status, education level, income, occupation, pain experience, knowledge of type of anaesthesia, time of operation, preoperative anxiety related information provision was associated with preoperative anxiety. Current health status, self- perception, history of smoking were also the risk factors for preoperative anxiety. (Nigussie et al 2014, 72.)

2.4 State-Trait Anxiety Inventory (STAI)

Measuring the preoperative anxiety is the primary and significant task in reducing anxiety. State-Trait Anxiety Inventory, developed by psychologist Charles Spielberger, consist of 40 questionnaires based on a self-reporting basis and consist of 4 points-based scale. It can be measured directly or indirectly, for example, by measuring plasma cortisol and urinary catecholamines directly or by measuring blood pressure and pulse. (Matthias & Samarasekera 2012, 3.)

At present, anxiety is measured by many validated questionnaires like: State Trait Anxiety Inventory (STAI), Visual Analogue Scale (VAS), Hospital Anxiety and Depression Scale (HADS), Multiple Affect Adjective Check List (MAACL) and Amsterdam Preoperative Anxiety Information Scale (APAIS). Of the many validated questionnaire's that are used to measure anxiety, Amsterdam Preoperative Anxiety Information (APAI) Scale is a widely accepted screening tool with usage in Germany, the Netherlands, Mexico, Turkey, Korea and Japan. (Matthias & Samarasekera 2012, 3.)

APAIS was developed in 1996 and consist of six questions as shown in Table 1 and an economical instrument. Each question has a five-point Likert scale ranging from 1 to 5. Where 1 means not at all and 5 means extremely. (Berth, Hendrik & Petrowski, Katja & Balck, Friedrich 2007.)

APAIS Questionnaires	
1	I am worried about the anaesthetic
2	The anaesthetic is on my mind continually
3	I would like to know as much as possible about the anaesthetic
4	The procedure is on my mind continually
5	I am worried about the procedure
6	I would like to know as much as possible about the procedure

Table 1 Amsterdam Preoperative Anxiety Information Scale Questionnaires

The questionnaires cover both studying and monitoring the aspect of preoperative anxiety. Four questions represented the fear of anaesthesia and fear of the surgical procedure while rest of the two items represented the need for further information. The score from 1, 2, 4 and 5 show the level of anxiety while the score from question 3 and 6 identify the need for further information. (Berth, Hendrik & Petrowski, Katja & Balck, Friedrich 2007.)

While adding the score from question 1, 2, 4 and 5 (questions to determine anxiety score), if the score is more than or equal to 11 experiences anxiety. Similarly, for the answer of questions 3 and 6, if the patient scores between 2 and 4, it can be determined as having little or no information requirements, patients scoring between 5 and 7 is determined as having basic or average information requirements. Patient scoring between 8 to 10 are considered as having information requirements. Patients scoring

5 or more should be given information that is enough and legally necessary while patient below score 5 should be given information that is required by the law. Main constraint of this scale is that the tool is not able to determine between fear of surgery and fear of anaesthesia. (Turzáková 2014, 32-35.)

2.5 Effect of preoperative anxiety

Surgeries are usually regarded as major life changes for a patient and life changes usually provoke anxiety. Hospitalization activates anxiety regardless of the disease since people visit hospital usually when they have a health problem. So, for a patient preparing for surgery, it is natural to notice increased anxiety level. The distressing experience causes tension, uneasiness and high level of autonomic activity that have the possibility to harm the recovery process. (Bedaso & Ayalew 2019, 18-19.)

The level of preoperative anxiety may adversely affect different aspects of anesthesiologic approach, surgical recovery and outcome. The activated metabolic and hormonal systems due to anxiety also activate the sympathoadrenal route and result in increased secretions, increased gastric acidity, increased motility of the gastrointestinal system and increased levels of catecholamines. These may cause adverse effects during the anaesthesia and surgery. (Cevik 2018, 145.)

The type of anaesthesia also determines the level of anxiety at the preoperative phase because patient usually make their mind based on how long and where the anaesthesia is administered (Bayrak, Sagiroglu & Copuroglu 2019, 868). Researchers have been able to establish a relationship between a high level of anxiety and higher frequency of nausea and vomiting. Previous studies report that if the cause of preoperative anxiety is fear of pain then it's more difficulty to control postoperative pain. A positive correlation was found between preoperative anxiety and postoperative pain scores in patients. (Ali, Altun, Oguz, Ilhan, Demircan & Koltka 2013, 225-226.)

Preoperative anxiety has more disadvantage in postoperative phase. Complication such as increased pain, nausea and vomiting, increased fatigue, increased discomfort,

high blood pressure and pulse which need additional bed rest, sleep disturbances, tiredness or energy deficits, increases fear of mobility and doing day to day activities with may reduce quality of life. It also effects rates of return to the work and doses of medication. Thus, high level of preoperative anxiety is directly associated with postoperative complications and recovery. (Kagan & Bar-Tal 2008, 581-583.)

During intraoperative period previous research shows that high level of preoperative anxiety increases the need of anaesthetic and increases the recovery time. The total effect being that patient ended up spending more time in recovery and at hospital. (Ali et al. 2013, 225-226.)

2.6 Role of nurses during the preoperative phase.

The main aim of perioperative nursing care is to maintain the quality of life in order to ensure safe environment to the patient before, during and after operation. Patients who are physically and psychologically prepared for surgery gravitate to have better surgical outcomes. (Mulugeta, Ayana, Sintayehu, Dessie & Zewdu 2018, 155.)

Preoperative care involves various components that must be done to all the patient undergoing the surgery treatment in the clinical setting. Generally, includes a detailed history, physical examination and different tests and investigation such as preoperative assessment. (Turunen, Miettinen, Setälä & Vehviläinen-Julkunen 2017, 915.)

Poor history taking and physical examination may guide irrelevant diagnostic testing and surgery treatment. The history should focus on the surgical procedure indication, surgical and known medical history, major trauma, current medication, allergies and undesirable medicines side- effect. Medical history assessment should contain heart diseases (ischemic heart disease, congestive cardiac failure), respiratory diseases, diabetes mellitus and liver or renal functions because anaesthetic drugs have adverse effect on cardiovascular and respiratory system. Patient lifestyle (smoking and alcohol intake, substance abuse) should not be overlooked as they are associated to anaesthetic drug and intubation. A research had found that the latex allergy accounts about

19% of all anaphylactic reaction during surgery so latex allergy history should be taken during history taking. (Akhtar, Macfarlane & Waseem 2013, 318-320.)

A full general examination should be performed to identify any abnormalities. More emphasis needs to be given during the examination of cardiorespiratory system, gastrointestinal system, musculoskeletal system. The airway examination, vital to foresee difficulty for intubation, is also performed by the anaesthetist during Preoperative anaesthetic consultation. (Turunen, Miettinen, Setälä & Vehviläinen-Julkunen 2017, 915.)

The preoperative assessment also included a laboratory testing, radiological examination. All patient with surgery treatment undergoes a range of routine pre-operative laboratory test like complete blood count, electrolytes, prothrombin time, activated partial thromboplastin time, urinalysis. Some of tests are directed by the patient's clinical needs. For example; electrocardiogram (ECG) for the patient with history of cardiac disease, or is over 60 years of age, chest X-ray for the patient with history of respiratory diseases. The goals of routine pre-operative tests are to identify known and unknown medical conditions and to forecast the post-operative complications for patient safety. (Akhtar, Macfarlane & Waseem 2013, 319.)

Preoperative nurses also work as coordinator. After preoperative assessment they must share all the information with the multidisciplinary team, patient and patient's relatives. As the educator preoperative nurses must provide all essential information and instruction regarding pre, peri and post-operative procedures. Preoperative instruction included information about hospital environment and routines, smoking cessation, resting habits, nutrition, preventing infection, nil per oral (NPO) guidelines, waiting time and other preoperative issues such as preoperative examination and its reports. Post-operative instruction includes postoperative care, pain management and recovery. While providing information it is important to use different methods by evaluating the patient's level of understanding. For example, play preparation is suitable method with children and their family while video animation can be suitable for adults

with a better understanding of their own body. (Turunen, Miettinen, Setälä & Vehviläinen-Julkunen 2017, 925-930.)

Most significant role of preoperative nurses is to give psychological and emotional support to the patient as well as their family by giving opportunity to discuss about experiences, fear and anxieties. Preoperative nurses provide patient and family-centred care and encourage the patient and the family to take an active role during all phases of surgery. (Turunen, Miettinen, Setälä & Vehviläinen-Julkunen 2017, 925-930.)

Different method has been introduced to reduce preoperative anxiety. Pharmacological intervention and non-pharmacological intervention that involve information, communication, stress reduction counselling, music therapy, aromatherapy, using essential oils and relaxation techniques. (Nigussie, Belachew & Wolancho 2014, 67.) In addition, supportive counselling, biofeedback and group support, extensive patient education may be purposeful intervention for anxiety during preoperative period (Parris, Matt, Jamison, & Maxson 1988,61).

3 Aims, Purpose and Research Questions

The aim is to highlight the nursing interventions to reduce pre-operative anxiety through existing literature. The purpose is to provide evidence-based knowledge to nurses on how to reduce preoperative anxiety of patient during preoperative period.

Research question

What are the various nursing interventions to reduce pre-operative anxiety?

4 Methodology

4.1 Literature review

Literature review is selection, examination and evaluation of available document and research of a certain problems or phenomenon. Researcher use intellectual ability to

recognize relevant information and to synthesize and evaluate it by being focused on a research question which provides valuable data of given problem. Literature review gives more confidence in the evidence obtained. It provides reader with an efficient synthesis of finding on given problem. (Ruw 2010, 65.)

Literature review aims to describe, summarize and synthesize findings of the certain problems. It proceeds from planning review phase, conducting review phase to documenting phase. Where planning phase induce, defining research question, purpose and inclusion exclusion criteria of the study. Review conducting phase consists with identifying relevant research, assessing study quality, extracting required data, summarizing and synthesizing data according plan. Documenting the valid report is the last phase of literature review. (Ruw 2010, 65.)

With literature review, researchers and practitioners can save the significant amount of time and resources by relying on other experts work when they are facilitated with pre-filtered evidence. Establishment of pre-filtered evidence is done by an expert in a field who reviews the evidences of methodologically strongest data in the given field. Access to such pre-filled evidence is necessary to delimit bias by compiling results of many original studies. Literature review thus acts as an important tool to utilize researches done by different experts but is neutral to how the study was designed. Literature reviews help to identify the gaps on the knowledge on certain topics. Such identified knowledge gap can be further studied setting a good case for future research. (Schloosser 2006.)

Literature review method was applied in this study. Researcher had followed the principle and guideline of literature review method.

4.2 Literature search

Location and method to perform the research is decided after identifying the research question. Identification of research question is an important step in research which helps to guide the research into the correct direction. Reviewer, during the process of

gathering list of available scientific articles, determines if an article is included or excluded based on if certain search term is included in the article. Online resources such as Research Gate, PubMed, University's library catalogue usually has an advanced search web-based interfaces to make this process efficient and effective. Similarly, an expert can be contacted to get expert's feedback on the topic, such feedback can guide the researcher to gather more resources in addition to available online databases. This approach of literature search is called ancestry search which has both advantages and disadvantages, but a major disadvantage is that articles may be the dated. The process is iterative e.g. trying different search terms and combination to find more relevant articles. (Rew 2010, 66.)

As mentioned above, Preliminary literature search was conducted in June 2019. After readjustments based on thesis supervisor's comment, final literature review was conducted on 20 October 2019. Final literature search was done using CINAHL (Ebsco) and PubMed databases. CINAHL (Cumulative Index to Nursing and Allied Health Literature) was used since it contains journals related to nursing and PubMed was chosen because it was recommended by information specialist at University of Jyväskylä Library. Besides, they are both recognized as highly valuable databases for health information research (Rew 2010, 66.) To maintain consistency and minimize bias, a protocol and criteria was established in advance then actual search.

In the CINAHL database first search term as a Mesh (Medical Subject Heading) pre-operative anxiety or preoperative fear or preoperative concern. The second one (connected with the Boolean operator AND) was a free search term nursing intervention or nursing care or nursing support and best practices. The Same two search term was used in PubMed database. Combinations of the key word were used in two databases with limiters full text available, published between 2010-2019, English language, peer-

reviewed. The full inclusion and exclusion criteria are summarized in Table 2. Description of the target population, phenomenon of interest, context and study types of the research is shown in Table 3.

Inclusion criteria;	Exclusion criteria;
Full text available for students	Not primary research
Peer-reviewed	Not relevant to the research topic
Published between 2010-2019	Not answering the research question
Study in English	
Primary research	
Answers the research question	
Scientific publication, doctoral and master's thesis	

Table 2 Inclusion and exclusion criteria

P	Target population	Patient having surgery
I	Phenomenon of interest	Reduce preoperative anxiety
C	Context	Nursing intervention
O	Study types	Research

Table 3. PICO Table

When the inclusion criteria, exclusion criteria, and search terms are identified the next logical step to determine the search engines most likely to contain the articles that will answer the research questions and start finding the article with the electronic search. Such results collection become the basis for selecting the sample articles to study and

review. The abstract and title of the article contain the search terms implying that the article might be of interest to answer the research question. But not all the articles in the collection can be of value. (Rew 2010, 66-67)



Figure 1. Article selection process

The articles selection process, which resulted in ten full text articles to be reviewed as mentioned in the figure 1. The researcher chooses ten articles (N=10) for this review. Among those articles, six (n=6) of them are Randomised controlled trials (RCTs), two (n=2) are Randomized quasi experimental trail, one (n=1) is survey and the rest are Non- randomized prospective controlled. All the research included are quantitative research where six of them had used State-trait anxiety inventory (STAI), two had used hospital anxiety and depression scale (HADS), one had used Amsterdam preoperative

anxiety information scale (APAIS) and one had used survey question to measure the level of anxiety. Five of the researches were conducted in Iran, one in Italy, one in Germany, one in China and two in The United States. The research included in the finding of this study were published from 2010 to 2019.

All included studies were appraised in three stages; assessment of relevance, data extraction and scoring for methodological rigor using the critical appraisal developed by Hawker, Payne, Kerr, Hardey & Powel in 2002. In the last stage, 9 factors of the reviewed research had been analysed and given the points for each factor from 1(very poor) to 4(good). Factors that had been analysed were abstract and title, Introduction and aims, Method and data, Sampling, Data analysis, Ethics and bias, Results, Transferability or generalizability, Implications and usefulness. After totaling the score from each factor. Each research was categories as very poor (0-10 points), poor (10-20 points), fair (20- 30) and good (30-40). (Hawker, Payne, Kerr, Hardey & Powell 2002, 1290-1293; Alanazi 2014, 388). The average score of all appraised studies was 38.1 where the lowest score was 27 and highest was 35 as mention in appendix 1.

4.3 Data analyses

In this study content analysis method was used as it is a well-developed and widely used method in social science (Dixon-Woods, Agarwal, Jones, Young, Sutton & Noyes 2008, 94). Content analysis is a research method and means of describing and quantifying phenomena which can be used to analysing documents. Content analysis method can be used with quantitative as well as qualitative data. Similarly, in an inductive or deductive way. (Elo & Kyngäs 2008, 107-108.)

Data extraction was done after going through all the chosen studies by being base on the research question of the study. The statement that gives the answer to the research question was marked and only needed data was extracted from studies. Those all studies met the inclusion criteria of the thesis. (Rew 2010, 68).

The data was divided into categories and subcategories according to research question. In the last phase of the analysis the subcategories with similarities in their contents was connected into main categories. (Dixon-Woods, Agarwal, Jones, Young, Sutton & Noyes 2008, 94.)

4.4 Ethical considerations and reliability

During the literature reviews the researcher had no direct contact with the participants as researcher review collected secondary data from original articles. Ethical approval was not necessary. (Vergnes, Marchal-Sixo, Nabet, Maret & Hamel 2011, 772.) The reviewer had searched the original articles from a trustworthy database which was provided by JAMK University of applied sciences that are free for students and databases used were CINHALL and PubMed. So, the reviewer had trust on the researcher that the research was conducted in ethical manner. The reviewer had followed the instructions of the Finnish National Board on Research Integrity and made sure no research fraud was done. Falsification was avoided by not modifying the result, information and the conclusion of original articles. Avoidance of plagiarism had done by referencing all the assessed data and at the end all the review was checked for plagiarism by using Urkund system.

In this study, to maintain consistency and minimize bias, a protocol and criteria was established in advance prior to actual search. The unambiguous and a full description of the method and documentation of review contributed to the study's reliability.

(Rew 2010, 68.)

5 Result

All the researches (N=10) included are of the type experimental research design study and quantitative research. From the data analysis, different nursing intervention to reduce the preoperative anxiety were found. Those intervention are grouped into four

main categories: preoperative educational, psychological support, preoperative nursing visit and music therapy to reduce preoperative anxiety. The main categories and their subcategories are shown in Table 4.

Research question	Main categories	Subcategories
What are the various nursing interventions to reduce preoperative anxiety?	Preoperative information	<ul style="list-style-type: none"> • Verbal information • Audio-visual information • Written information.
	Psychological support	<ul style="list-style-type: none"> • Emotional support • Discussion
	Preoperative nursing visit	–
	Music therapy	–

Table 4 Main Categories and subcategories for data analysis and synthesis

5.1 Preoperative education

Preoperative education provided to patients to prepare them both mentally and physically is amongst the most effective method to reduce preoperative anxiety. Preoperative education constitutes of any verbal, written and audio-visual material to help understand the surgical process. (Bisbey 2017,325; Guo East & Arthur 2012,132; Abdi,Ghazavi & Abrishamkar 2019, 334-335.) Audio visual aid aimed to increases awareness of the treatment and reduce the unknown related anxiety. Some studies on effect of preoperative multimedia information with verbal information on perioperative anxiety, found significant different ($P < 0.005$) on the level of anxiety between the patient with video base information and basic information. (Abdi,Ghazavi & Abrishamkar 2019, 334-335; Zarei, Valiee, Nauri, Khosravi & fathi 2018, 8-14.)

Preoperative verbal information, written information, demonstration of certain care and open conversation deemed to be useful nursing intervention to reduce patient preoperative as well as postoperative anxiety and increased confidence in postoperative self-care (Bisbey 2017,325-326; Zarei, Valiee, Nauri, Khosravi & fathi 2018, 8-14). The study demonstrated that preoperative education with leaflets information and verbal advice with reassurance reduces preoperative anxiety significantly ($P < 0.005$) then in the patient with usual basic information and care. (Guo East & Arthur 2012.)

5.2 Preoperative nursing visit

Preoperative nursing visit appear as an essential intervention as it provides physiological support and emotional support to the patient which is useful to reduce preoperative anxiety. Preoperative nursing visit includes evaluating patient's condition, documenting observation, listening to patient's concerns and responding the patient's concerns. It provides an opportunity to collect data that is useful for enhancing patient management during surgery and to help patient educate on the need of their cooperation during surgery with the surgery team and medical care. Such visits give more opportunity to interact with patients that make patients feel more secure. (Sadati, Pazouki, Mehdizadeh, Shoar, Tamannaie & Chaichian 2013, 995; Zarei, Valiee, Nauri, Khosravi & fathi 2018, 8-14.)

Studies have indicated that the patient group who were visited by nurses to inform them about the operation and help them calm, the level of anxiety score was significantly reduced compared to the control group ($p < 0.05$) Similarly, vital sign stabilization duration, postoperative pain, nausea and vomiting and first mobility after operation was significantly lower compared to the control group. (Sadati et al. 2013, 995-996; Zarei et al. 2018, 13-14.) According to Zarei et al. (2018, 14), use of multimedia for appropriate information during preoperative nursing visit helps to decrease preoperative anxiety and stabilize vital signs.

5.3 Music therapy

Music therapy is a non-invasive therapeutic intervention to reduce anxiety and stress as well as physiological parameters such as respiration rate, pulse rate and blood pressure. It is among the cheapest while effective method to reduce preoperative anxiety while this method is also less time consuming. (Mohammadi, Mirbagher Ajorpaz, Torabi, Mirsane, & Moradi 2014, 157-158; Binns-Turner, Wilson, Pryor, Boyd & Prickett 2011,26.; Amiri, Sadeghi & Negahban 2017,4.) Music therapy also plays a positive role on neurological effect which enhance patient's well-being and make feel relaxed and promote anxiety reduction (Amiri et al. 2017, 3).

Music therapy appear to have a significant role in reducing preoperative anxiety. Some studies on the effect of music listening on anxiety, indicates that anxiety score in a control group was increased while decreased in experimental group who had music therapy. Researcher identified a significant different in the state of anxiety before and after musical intervention period on the patient undergoing surgery. (Mohammadi et al. 2014,158; Binns-Turner 2011, 24-25; Amiri et al. 2017, 4.)

5.4 Psychological intervention

Psychological support has a positive impact on the individual to reduce anxiety. Pre-operative visit by a recovery nurse or theatre nurse and others health personal provide emotional and psychological support and an opportunity to express feelings during preoperative phase reduces the level of anxiety. (Tristaino, Lantieri, Tornago, Gramazio, Carriere & Camera 2016, 141; Zarei et al. 2018, 12; Sadati et al. 2013, 995.) Pre-operative information about the diagnosis, treatment and surgery enhance patient's understanding ability and provides emotional support. Multimedia information such as audio-video is more appropriate for psychological and emotional support. (Aust, Rüscher, Schuster, Sturm, Brehm & Nestoriuc 2016, 250; Zarei et al. 2018, 12) Calming conversation with medical personal helps patients to cope with preoperative anxiety.

Patient with emotional support of family and friend had a lower level of anxiety and feels easier to cope with preoperative anxiety. (Aust et al. 2016, 250.)

6 Discussion

6.1 Discussion of key results

The aim of this literature review was to highlight the various nursing intervention to reduce pre-operative anxiety through existing literature. The data from ten studies were organized and process by content analysis.

This review showed that preoperative anxiety decreased in the group of patients with preoperative education. Similarly, In the studies conducted by Oshodi (2007, 708); Delano (2017,63); Alanazi (2014, 388) indicated that preoperative anxiety was reduced by preoperative education.

According to this study, the level of preoperative anxiety significantly decreases with preoperative education using audio-visual information, written information and verbal information. Similarly, a study showed that patient receiving verbal education with leaflets were significantly less anxious during the preoperative phase than patients who did not. (Giraudet-Le Quintrec, Coste, Vastel, Pacault, Jeanne & Lamas 2003, 116-117). Likewise, the video-base information during preoperative period remarkably decreases the anxiety level of patient (Cakmak, Kose, Zinzircioglu, Karaman, Tekgul & Pektas 2018, 276-278). The study conducted by Huber, Ihrig, Yass, Bruckner & Peters (2013) found no significant different ($P=0.009$) in the anxiety level between the patient who received the usual preoperative care and patient with multimedia-supported pre-operative education. Which is the contract to this study finding.

According to a previous study, there were comparatively similar self-rating anxiety score between the intervention and the control group before nursing visit. After the preoperative nursing visit, anxiety score of the intervention group was significantly

lower than control group. (Du, Wang & Yan 2017, 2497.) The result is kin to this study (Sadati et al. 2013, 996).

This study revealed that there is a significant association between music therapy and level of anxiety ($p=0.01$) (Mohammadi et al. 2014, 157; Binns-Turner et al. 2011, 24). Which is similar with the finding of previous studies (Lee et al. 2011, 5; wang et al. 2002, 1491; Bradt et al. 2013, 17; Arslan et al. 2007, 51).

This study shows the direct effect of emotional support from the medical personal, family and friend on the patient anxiety level. Discussion with the health personal helps patient to cope with preoperative anxiety. Which is congruent to the previous studied. (Sansone, Bellini, Ghersi, Zingarelli, Flocco, & Casabona 2011; Renouf, Leary, & Wiseman 2014,1210-1211).

6.2 Limitations and strengths

The reviews results were from the reliable data base CINAHL and PubMed that mostly contains journals related to medical fields. The quality of the articles was assessed before data extraction. The articles that were finally appraised are from different countries, thus the results avoid of ethnical and geographical bias. The predefine protocol of the thesis helped to avoid bias and made it more trustworthy. However, the review results were limited to only two databases which are available to all JAMK University of Applied Sciences students. This decision was made as there was no funding source nor award for conducting the study. English language articles were the only ones included in this review, leaving out a multitude of articles which would have been published in some other languages.

6.3 Conclusions and recommendations for further studies

This thesis reviewed and highlighted various nursing intervention to reduce preoperative anxiety. Various nursing intervention such as preoperative information, preoper-

ative nursing visits, music therapy and psychological support appeared to have a significant association on reducing the preoperative anxiety. The finding of a study provides evidence base nursing intervention to reduce preoperative anxiety.

Future research is needed to determine the effectiveness of nursing intervention to reduce preoperative anxiety in the different group of population. As there are still uncertainties about the most effective nursing intervention to reduces preoperative anxiety.

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Appendices

Appendix 1. Summary of the selected articles.

SN	Author(s) year country	Title	Aim(s) and Purpose	Study types, population and sample size	Experiment(E) and control (C) group and intervention	Evaluation instrument	Key results	Critical appraisal (Hawker et.al 2002)
1	Abdi, Ghazavi and Abrishamkar (2019) Iran	The effect of electronical flim on the anx- iety of patient candidate for lumbar disc surgery.	To examine the effect of the film on patient's perioperative anxiety.	Randomized controlled trial N=30 patients un- dergoing for lumber disc surgery	E: Video in- formation C: Basic ed- ucation	State-Trait anxiety in- ventory (STAI)	Patients in the film group were less anxious before op- eration than those in the control group	35(Good)
2	Bisbey (2017) USA	The power of education: pre- operative class reduce anxiety and improves confidence	To examine the improvement of patient confi- dence and anx- iety	survey N=209 Patient un- dergoing prostatec- tomy	Preopera- tive class	Survey Question	Preopera- tive class significantly reduced anxiety	28(fair)

3.	Guo East & Arthur (2012) China	A preoperative education intervention to reduce anxiety and improve recovery among Chinese cardiac patients: a randomized controlled trial.	To evaluate whether a preoperative education could reduce anxiety and improve recovery	Randomised controlled trial N=135 Patients going cardiac surgery	E: education and information leaflet C: the usual care	The Hospital Anxiety and Depression Scale (HADS)	decrease in anxiety level among the experimental group then control group	33(Good)
4	Mohammadi, Mirbagher Ajorpaz, Torabi, Mirsane, & Moradi (2014) Iran	Effects of Music Listening on Preoperative State Anxiety and Physiological Parameters in Patients Undergoing General Surgery: A Randomized Quasi-Experimental Trial	To evaluate the effect of music on preoperative state anxiety and physiological parameter.	Randomized quasi-experimental trial N= 60 Patient undergoing general surgery	E: non vocal classical music C. no music	State-Trait Anxiety Inventory (STAI)	Listening to music during the preoperative period reduce preoperative anxiety.	32(Good)
5	Binns-Turner, Wilson, Pryor,	Perioperative Music and Its	To examine the effect of a perioperative music	A quasi-experimental design.	E: Music intervention	State-Trait Anxiety Inventory	Findings indicated that women in	33(Good)

	Boyd & Pricket (2011) USA	Effects on Anxiety, Hemodynamics, and Pain in Women Undergoing Mastectomy	intervention on anxiety Heart rate mean arterial pressure and pain.	N=30	C: No music intervention Patient undergoing mastectomy	(STAI)	the intervention group had a greater decrease in MAP and anxiety with less pain from the preoperative period to the time of discharge from the recovery room compared with women in the control group	
6	Sadati, Pazouki, Mehdizadeh, Shoar, Tamannaie & Chaichian (2013)	Effect of preoperative nursing visit on preoperative anxiety and postoperative complication.	To investigate the effect of preoperative nursing visits on anxiety and postoperative complication.	Randomized clinical trial N=100 Patient undergoing laparoscopic	E: two preoperative interviews C: routine nursing care	State-Trait Anxiety Inventory (STAI)	Preoperative nursing visits decreased the level of preoperative anxiety and	30(Good)

	Iran	cations in candidates for laparoscopic cholecystectomy: a randomized clinical trial.		cholecystectomy			postoperative complication.	
7	Aust, Rüsçh, Schuster, Sturm, Brehm & Nestoriuc (2016) Germany	Coping strategies in anxious surgical patients	To obtain descriptive data about coping in the environment of a modern preanaesthetic clinic	N= 1205 Patient with high pre-operative anxiety	All adult patients scheduled to undergo any kind of anaesthesia and surgeries	Amsterdam Preoperative Anxiety and Information Scale (APAIS) and the visual analogue scale (VAS)	Conversation with medical staff proved to be the most popular coping strategy.	30(Good)
8	Tristaino, Lantieri, Tornago, Gramazio, Carriere & Camera (2016) Italy	Effectiveness of psychological support in patients undergoing primary total hip or knee arthroplasty: a controlled cohort study	To determining the effectiveness of psychological support in patients undergoing primary total hip or knee arthroplasty	Non-randomized prospective controlled cohort N=200 patients undergoing primary total hip or	E: psychological support from a professional C: routine care	Hospital Anxiety and Depression Scale (HADS)	lower incidence of anxiety and depression and better mental well-being in the group of patients who received the	27(Fair)

				knee arthroplasty			psychological support	
9	Zarei, Valiee, Nauri, Khosravi & fathi (2018) Iran	The effect of multimedia-based nursing visit on pre-operative anxiety and vital signs in patients undergoing lumbar disc herniation surgery: A randomised clinical trial	To determine the effectiveness of a multimedia-based nursing visit on preoperative anxiety and vital signs in patients undergoing spinal disc herniation surgery.	A randomised clinical trial N=60 patients undergoing spinal disc herniation surgery.	E: Preoperative nurse visit with multimedia information C: Basic care.	State-Trait Anxiety Inventory (STAI)	statistically significant difference between the two groups in terms of the preoperative anxiety, systolic and diastolic blood pressure, pulse and respiratory rate	35 (Good)
10	Amiri, Sadeghi & Negahban (2017) Iran	The effect of natural sounds on the anxiety of patients undergoing coronary artery bypass graft surgery.	To investigate the effect of natural sounds on the anxiety of patients undergoing coronary artery bypass graft surgery (CABG)	A randomised clinical trial N=90 patients undergoing coronary artery bypass	E: Natural sound music C: Basic care	State-Trait Anxiety Inventory (STAI)	anxiety level of the intervention group has been found to be significantly lower than that of the control	35(Good)

				graft sur- gery (CABG)			group half an hour af- ter the in- tervention as well as in the waiting room in the preopera- tive period	
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