

LITERATURE REVIEW OF PRE-OPERATIVE ANXIETY

Abstract

Preoperative anxiety is a prevalent and a multifaceted psychological phenomenon that affects individuals facing surgery. This literature review provides an extensive analysis of the existing research on preoperative anxiety, synthesizing findings from various studies and shedding light on its prevalence, causes, consequences, assessment, and management strategies. The review explores the physiological, psychological, and sociodemographic factors contributing to preoperative anxiety, as well as its impact on surgical outcomes, patient satisfaction, and healthcare costs. Additionally, it delves into the various assessment tools used to measure preoperative anxiety, discussing their strengths and limitations. The chapter also highlights a range of interventions aimed at alleviating preoperative anxiety, including pharmacological, psychological, and complementary approaches. Understanding preoperative anxiety is crucial for healthcare professionals, as it can inform strategies to enhance patient care and surgical outcomes, ultimately improving the overall quality of healthcare delivery.

Keywords: Physiological, Healthcare, Management.

Authors

Dr. Snehal R Sonani

Assistant Professor
G J Patel Institute of Ayurveda studies and research
New V V Nagar, India

Dr. T. S. Dudhamal

Professor
Institute of teaching and research in Ayurveda
Jamnagar, India

Procedure of surgery can lead to various type of physical as well mental changes which ultimately leads to negative emotional impact in patients who were still in physical stress of disease itself. This negative emotional impact is anxiety which is very common and meant as a normal response in preoperative phase. ^[1, 2]

Even at high levels, preoperative anxiety does not often fulfil the clinical criteria for general anxiety disorders. Importantly, preoperative anxiety may be changeable, and identifying these patients may provide an opportunity to improve psychological comfort, therefore enhancing surgical outcomes. ^[3]

Given the prevalence of previously undetected psychological problems, preoperative psychological examination is now required in some medical settings to provide timely and suitable therapies. ^[4] The use of a basic screening questionnaire may deserve additional research for speedy bedside examinations. A rapid assessment of anxiety symptoms as part of the preoperative examination may allow the identification of high-risk individuals, after which suitable pharmaceutical or psychotherapy therapies may be used. ^[5,6]

I. DEFINITION OF PRE-OPERATIVE ANXIETY:

Pre-operative anxiety is a vague, uneasy feeling, its source is often nonspecific and unknown to the individual. ^[3] sympathetic, parasympathetic, and endocrine stimulation in such conditions can cause abnormal hemodynamic. But this pre-operative anxiety can lead to more complication in intra-operative as well post-operative period by producing aggressive reaction of stress, this phase can be observed for very short period or in chronic form ^[4]. Thus, stressful event occurring during peri-operative phase can triggers specific emotional, cognitive, and physiological responses of a patient that can be defined as a pre-operative anxiety. Komolafe, Csernus & Fülöp (2015, p.80) observed that increased stress during pre-operative period will induce “negative daze- A state of confusion.”

Longer waiting time for surgery in pre-operative room is very known trigger to anxiety. It can even lead to postponement of procedure often or negative impact on procedure. According to Marran (2010, p.9); Anxiety can be understood as an autonomic mental and physiological response to stress or fear which helps a person to fight or flight the danger.

The American Psychological Association defines anxiety as "an emotion characterized by feelings of tension, worried thoughts and physical changes like increased blood pressure." In nutshell, Anxiety is a subjective feeling of nervousness, worry and tension.

II. THEORETICAL LITERATURE OF PRE-OPERATIVE ANXIETY

It was observed in various studies that there are variations in response to anxiety triggering situation in person-to-person. Spielberger described this related difference of reaction to anxiety proneness and ability to cope with them as a “Trait anxiety”. Whereas “State anxiety” depicted by the psychological and physiological transient reactions directly in reaction to adverse situations in a specific moment.

Table 1: Theoretical description of “Anxiety” by various author

Author	Description
Strongman K.T. (1995, p. 8)	Anxiety differs from fear in the aspect that fear is generated by tangible object with known or expected outcome and it can be elapsed while having anxiety. It can't be avoided even though in absence of danger, Moreover the author said that anxiety is feeling generated by unsurety about the future and meeting to very new danger in life that haven't been priorly.
Douilliez and Philippot (2006, p. 8)	Anxiety plays main role in efficient reaction to the threat by detecting it.
Osborn & Sandler (2004, p.46-47)	Anxiety is physiological defence mechanism which gives motivation to candidate to get ready for essential reaction or action. For example, student get motivation for reading before exam due to some extent of anxiety, but on contrary; higher level of anxiety does negative effects on an individual.

Table 2: Theoretical description of “Trait and state anxiety” by various author

Author	Description about “trait and state” anxiety
Marran (2010, p.12)	The terminology “trait anxiety” can be understood as a trait of personality, which describes approach of individual related to a tendency to present state anxiety.
Bakr, Ali, and Khudhr (2014, p. 2)	The trait anxiety is an individual permanent personality which cannot be influenced by a stressful situation or can't be affected by any triggering factors like surgery. Level of State anxiety varies based on individual understanding about the situation to be high or low dangerous. So, higher level of State anxiety in a higher threatening event and low in the safe or less threatening situation.
Tovilović <i>et al</i> (2009, p.492)	The state anxiety is as an unpleasant emotional response while having threatening or dangerous events.

III. INCIDENCE & PREVALENCE OF PRE-OPERATIVE ANXIETY

Table 3: Incidence and prevalence of pre-operative anxiety in various studies

References	Percentage of Incidence and prevalence
World Health Organization (2010)	Incidence: Ranged from 60 - 80 % in Western Europe population
Bedaso & Ayalew (2019, p.18)	Wider range which is from 11 to 80 % among adult patients.
Nigussie, Belachew & Wolancho (2014, p.67)	level of anxiety in 70 % patients before the operation from 239 patient

Highest prevalence i.e. 32% was observed in the study which was done on the patients awaited for the general surgery^[5] and 50% in patients awaiting for coronary artery bypass graft surgery (CABG).^[6] Same or somewhat higher prevalence was observed in Asian country.^[7] Briefly, Anxiety level and its incidence rate can be varying in different populations.^[8] A systematic review and meta-analysis of various worldwide studies reported a pooled prevalence of 48% for preoperative anxiety among patients undergoing surgery^[9]. Relative factors like setting of surgery, gender, motives for surgery and country can alter the incidence or prevalence of anxiety.^[10] The type of surgery found to be important factor for the prevalence of preoperative anxiety, in that reference, European study found 27% to 80 % prevalence among patients undergoing for surgery. Hellstadius et al. reported 34% patients with pre-operative anxiety in oesophageal cancer patients; among that 15% had mild, 14% had moderate, and 5% had severe level of pre-operative anxiety^[11].

Prado-Olivares et al. had reported that preoperative anxiety is more common in patients undergoing for cardiac surgery, patients got more worried as the risk is more in such complex procedure. This is evidenced by study findings which showed anxiety in 80% of patients, from that 40% of patients had higher level of anxiety before cardiac surgery.^[12] Studies in different country showed different percentage of incidence of pre-operative anxiety. In United state-20.2%, In Netherland- 22.7%^[13] and 45.24% in Chinese patients^[14]. Psychological imbalance in pre-operative phase found higher in Asians.^[15] These Variation may be due to socioeconomic characteristics, culture, and environmental factors that contribute to the different expression of personality traits.

IV. EMPIRICAL LITERATURE ON LEVELS OF PREOPERATIVE ANXIETY

Heldegard E. Peplau (an American psychiatric, nursing theorist and a nurse) had demonstrated **four** level of anxiety based on severity of presenting symptoms.

Table 4: Four levels of anxiety by Heldegard E. Peplau

Sr. No.	Level of anxiety	Description	Other references
1.	Mild Level	Normal physiological reaction to triggering factor which impose positive effect and presents complaints of minor discomfort in	Frazier, Moser, Riegel, McKinley, Blakely & Garvin (2002, 57); Disano (2015, p.6.)

		behaviours such as nail biting, finger - foot tapping, fidgeting, irritability, and impatience	
2.	Moderate level	Manifested as a feeling of tension, worry and nervousness. This level can decrease the ability to solve problem and comprehend information. Mind process for ability to understand a situation will become a more limited than in mild level. Presenting symptoms are muscle tension, diaphoresis, headache, pounding pulse, dry mouth, voice change, frequent urination, increases automatisms.	Videbeck (2014, p.50.)
3.	Severe level	An individual feel of horror or awe along with difficulty in thinking and reasoning. Additional capacity to adopt new learning, problem solution got diminished by severe psychosomatic symptoms i.e., worse headache, nausea, vomiting, diarrhoea, withdrawal, threats and demands, dizziness, confusion, insomnia, trembling, tachycardia, hyperventilation, and chest pain.	Disano (2015, 6); Videbeck (2014, 50.)
4.	Most intense level of anxiety	It is a panic attack characterized by frightening emotions in which individual loses their mental stability and one starts misbehaviour i.e., run, shout, scream or severe hyperactivity or immobility, dilated pupils, severe shakiness, experiences of terror, sleeplessness, severe withdrawal, hallucinations, or delusions.	Disano (2015, 6); Videbeck (2014, 50.)

Some author had categorized preoperative anxiety in either high/low levels and clinically significant /not significant. Here, clinically significant and high level, whereas not clinically significant and low levels are used interchangeably. Bakr, Ali and Khudhr (2014, p.3) had classified the levels of preoperative anxiety under four categories: No, Mild, Moderate, or severe preoperative anxiety.

1. Grading of Various Scale for Level of Anxiety

Table 5: Grading of anxiety scales

Sr. No.	Anxiety scale	Grading	Reference
1.	Hospital Anxiety and Depression Scale (HADS):	Sum score ≥ 11 : High preoperative anxiety level Sum score < 11 : low preoperative anxiety level	Santos, Martins and Oliveira (2014, p.7); Williams <i>et al.</i> (2014, p.1).
2.	State version of State Trait Anxiety Inventory (S-STAI)	Sum score > 44 score: significant or High anxiety level Sum score ≤ 44 score: Low or not significant anxiety level	Jafar and Khan (2009,p 359); Nigussie, Belachew and Wolancho (2014, p.5)
3.	Pre-operative Intrusive Thoughts Inventory ('The PITI' or 'PITI-20')	Sum score ≥ 15 : Clinically significant preoperative anxiety Sum score < 15 : Not clinically significant preoperative anxiety level	Crockett, Gumley and Longmate (2007, p. 688)

V. TRIGGERING FACTORS OF PRE-OPERATIVE ANXIETY

There are various triggering factors which plays role in alteration of level of pre-operative anxiety i.e., various demographic condition, status of education, uncertainty of the exact day of surgery, mental instability which unable to deal with situation, financial loss, fear of surgery- death- postoperative pain. ^[16, 17, 18]

Also, lack of adequate and timely information to patients during the pre-anaesthetic consultation increases patient anxiety. One supportive clinical study which found that patients getting satisfying information during the visit with the anaesthesiologist showed lower rates of anxiety compared to those who didn't receive it. ^[19]

Actual observation says that preoperative anxiety starts from initiation of treatment planning which gradually increases and goes to its peak while entering the operating room. ^[20] So, anxiety starts from the day of admission, as patients must deal with the stress of hospitalization as well negative thoughts regards to impending surgery simultaneously.

VI. FACTORS ASSOCIATED WITH PREOPERATIVE ANXIETY

Pre-operative anxiety associated factors are enlisted as various demographic impact, previous surgical experience, type of anaesthesia - surgical procedures, severity of medical condition, and information about surgery.

1. Age

- Jafar and Khan (2009, p.360) found that preoperative anxiety found decreased with an increase in age ($p < 0.001$), so age is real predicting factor of preoperative anxiety. Same was observed by Bakr, Ali, and Khudhr (2014, p. 6) that more level of anxiety in young patients compared to old age patients ($P < 0.01$) and reported that this is due to less experience of such triggering situation in young population.
- Contrary to those studies, Fathi *et al.* (2014, p. 92) found higher level of anxiety in older age group compared to younger age group ($p < 0.001$). Similar observed by Basak *et al.* (2015, p. 19) and Kim *et al.* (2010, p.330) with age specification that more anxiety in age group more than 35 years old and aged ≥ 45 respectively. One another study who says that patients aged below 50 years had a higher incidence and degree of preoperative anxiety than those aged more than 50. ^[21,22] However, some studies had showed higher level in older age group which may be due to multiple comorbidities. ^[23]

Some of the research has also proven that age is not a risk factor for preoperative anxiety. ^[24] But Nigussie *et al.* (2014, p. 5) declared that there is no influence of age factor on level of anxiety. Thus, it is negatively correlated with level and occurrence of preoperative anxiety.

2. Gender

- Maheshwari and Ismail (2015, p.196) depicted that women with higher level of preoperative anxiety prefer general anaesthesia for caesarean section ($P < 0.005$).
- 72.7% incidence of preoperative anxiety before elective caesarean section, May be due to physical discomfort or worry of foetus. ^[25]
- Matthias and Samarasekera (2011, p. 4) conducted a study in shri lanka suggested that more level of pre-operative anxiety in females than the males, similar observation was found by Fathi *et al.* (2014, p. 92) in Iran .Masood *et al.* (2009, p. 39) and Basak *et al.* (2015, p. 19) had given probable explanation that these findings are due to more family bonding and ability to easy expression of feeling in the female.
- So, Gender was found to be a positively influencing factor with higher level of pre-operative anxiety in female. ^[26, 27, 28, 29]
- Contrary to this finding, Nigussie, Belachew and Wolancho (Specialised & teaching hospital, Jimma university, Ethiopia, 2014, p. 5) justified that sex did not influence on the occurrence of preoperative anxiety.

3. Marital Status/Economical status/Education

- Fathi *et al.* (2014, p. 94) observed higher incidence of anxiety in widowed or divorced female than single or married, But Komolafe and Csernus (2015, p. 97) found no association between marital status and pre-operative anxiety. ($p \leq 0.375$)
- Added to that, lower pre-operative anxiety was observed by Fathi *et al.* (2014, p. 94) in patients with higher education, good income rate and better social support, supportive findings by Basak *et al.* (2015, p. 19) that higher level of anxiety in patients with low income and lower education rate.
- Opposite finding by Nigussie, Belachew, and Wolancho (2014, p. 5) who declared negative correlation between education level and preoperative anxiety.

4. History of Previous Surgery

- Bakr, Ali, and Khudhr (2014, p. 5); Jafar and Khan (2009, p. 361) and Homzová and Zeleníková (2015, p. 324) had justified that previous surgery affects the level of pre-operative anxiety. It showed that patients underwent for at least one prior surgery are having low level of anxiety probably due to be having awareness of whole surgical process along with positive outcome of previous surgery.
- Incompatible observation by Nigussie, Belachew, and Wolancho (2014, p. 5) and Hong (2001, p. 4) concluded that nature and quality of previous surgery is more important factor influencing the anxiety than just having previous surgery.
- Shoaie *et al.* (2016, p. 707) observed that the longer waiting period before procedure can lead to higher level of anxiety ($P=0.003$). Additionally, Matthias and Samarasekera (2011, p. 5) declared that waiting for the operation is ranked as a first anxiety causing factor.
- Information regarding procedure will helps to lower the anxiety level. This statement is supported by Lee *et al.* (2016, p. 698) who observed that detailed information and surgeon's explanation of the surgery had reduced preoperative anxiety by 72.3 %, also Aust *et al.* (2016, p. 4) reported 63.7% patients aided by detailed information for pre-operative anxiety.

5. Types of Anaesthesia: Some studies reported that types of anaesthetic technique are associated factors with preoperative anxiety.

- Patients subjected to spinal anaesthesia had lower incidence rate and severity of preoperative anxiety than general anaesthesia^[30, 31]. Supportive findings by Bosc *et al.* (2015) that higher level of anxiety for general anaesthesia than local anaesthesia ($P=0.002$) in patients undergoing for oculoplastic and strabismus surgery. Same findings were observed by Jawaid *et al.* (2007, p. 147); Mitchell (2013, p. 41); Maheshwari and Ismail (2015, p. 197) in various studies.
- Maheshwari et al. found higher prevalence in general anaesthesia (97.18%) compared to regional anaesthesia (51.81%) for elective caesarean section^[32].

Conclusive note can be made that there are many associated factors as well many triggering factors i.e., emergency conditions, education, family background, and past surgical experience^[33, 34, 35, 36] for pre-operative anxiety according to various studies which varies person-to-person.

However, there is complexity in their interconnection with pre-operative anxiety and it still needs to be proven. By analysing all the recent study, scenario can be made that higher anxiety level may be observed in younger age group, female patients, major or fatal surgery, requirement of general anaesthesia and lower family support and lower communication regarding procedures.

VII. PSYCHO-SOMATIC RESPONSE TO PRE-OPERATIVE ANXIETY

Pre-operative anxiety is a physiological reaction to threatening situations of operative procedure, no matter what the extent is.^[37,38] Often, reaction is stable, it fluctuates with the time. Generally, starts prior to the surgery and persists till the late postoperative period.

Mental thoughts regarding operative procedures are different in different candidate, which is triggering for pre-operative anxiety level, some though operative procedure as a relief from pain or diseases, some consider it as a risk of life. Their mindsets are preoccupied by discomfort and worries of successful surgery along with other factors like career and family problems, postoperative care, long hospitalization.

Preoperative anxiety due to real or imaginary threats in very excess form can lead activation of the stress axis- the hypothalamic-pituitary-adrenocortical (HPA) system, which ultimately induces multiple physiological responses towards it, firstly in the cardiovascular system^[39, 40]. These results in tachycardia, arrhythmias, hypertension, and higher levels of pain, which can last till postoperative period.^[41] Thus, the impact of pre-operative anxiety is multidimensional and dramatic with serious physical and mental consequences^[42].

1. Impact on Operative Period: There might be a need of higher level of anaesthesia intraoperatively due to resistance of anaesthetic drugs due to pre-operative anxiety, these leads more vulnerability to unfavoured events or may be led to prolonged sate of anaesthesia.^[43 44]

Some study had also observed that patients with higher level of pre-operative anxiety needs higher dosage of propofol for general anaesthesia which give light to moderate sedation.^[45] Same findings were done by Kil *et al.* (2012, pp. 121-122). In addition, one study by Ali, Altun and Hakan (2014, p. 225) claimed that higher anxiety patients had more agitation (p=0.029) and shivering (P=0.044) as side effects of anesthetic agents compared to low anxiety patients. So, here conclusion can be made that assessment of preoperative anxiety levels can be helpful to adjust the dosage of anaesthetic agent.

Furthermore, many studies had observed that more anxious patients are more prone to morbidity of cardiovascular lesions, and it had direct influence on the myocardial perfusion, autonomic nervous system (ANS) regulation, platelet aggregation, higher activities of hypothalamo-pituitary-adrenal axis and tends to more inflammatory processes^[46 47 48].

2. Impact on Post-Operative Phase: There is a simple linear relation between preoperative anxiety and postoperative complications; so, there are lower incidence of postoperative complications in lower level of pre-operative anxiety than moderate to severe level of pre-operative anxiety. Although it is not conclusion, because sometimes it was observed that mild level of anxiety does the adoption to threatening stimuli and thus it improves postoperative outcomes^[49, 50]. However, it has been observed by various researcher that higher level of anxiety negatively affects patients' outcomes.^[51 52 53 54 55 56]

There is a good association of preoperative anxiety level on postoperative pain, patient's discomfort, satisfaction of surgery recovery, and psychosocial outcomes.^[57 58] Impact of preoperative anxiety on perioperative outcomes can be roughly divided into **four** aspects:

- Impact on patients' feelings
- Need of medical intervention

- Complications
 - Postoperative recovery.
- 3. Post- Operative Pain:** Sometime pain itself responsible for aggregation of incidence or severity of preoperative anxiety. Since long time, it has been recognised as a predictor of postoperative pain. ^[59, 60] Some studies had justified that state anxiety is positively correlated with postoperative pain. ^[61, 62, 63] Probably, due to lower threshold of pain ^[64], over judgement of intensity of pain ^[65], and activation of the entorhinal cortex of the hippocampal. ^[66]
 - 4. Patients' Satisfaction:** Observation in a study conducted on total knee arthroplasty patients declared that 6 times more risk of dissatisfaction in patients with higher level of anxiety along with higher hospitalisation due to delayed recovery than satisfied patients (Ali *et al.* 2016, p. 3). Ali, Altun and Hakan (2014, p. 225) also observed long hospitalisation ($r = 0.370$, $p = 0.001$) in higher level of anxiety.
 - 5. Risk of Infection/Nausea/Vomiting:** Pokharel (2011, p. 373); Homzová and Zeleníková (2015, p. 324); and Ayla *et al.* (2016, p. 1) found pre-operative anxiety correlated with post-operative complications like nausea-vomiting and risk of infection. Van Den Bosch *et al.* also supported to this finding. ^[67] Additionally, it was also observed that physiological changes due to stress can impair wound healing. ^[68] Studies have also established that preoperative anxiety can does impairment of immune response as well. ^[69] Some studies found that severe anxiety patients take more time for recovery from illness and may be it impact on their quality of life as well. ^[70]
 - 6. Cardiac events/Mortality:** Untreated anxiety in cardiac patients can lead to unavoidable consequences of fatal cardiac events ^[71] like congestive heart failure, acute myocardial infarction, or pulmonary oedema. one can use state-Trait Anxiety Inventory (STAI) score to predict hemodynamic responses during anaesthesia induction to prevent cardiac events in non-cardiac patients. ^[72] Moreover, Higher anxiety level is independent predictor for the risk of mortality and morbidity in patients of aged >70 years who are going for cardiac operative procedure. ^[73] A systematic review and meta-analysis done on 236,595 patients (16 studies) has also supported above findings. ^[74]
 - 7. Hospital Stays:** There is a strong association between longer hospital stay in higher level of anxiety patients which is discussed earlier in various impact, sometime higher anxiety can also lead to repeated hospitalisation due to dissatisfaction. ^[75, 76, 77].

Thus, higher preoperative anxiety does various negative impact in patient's overall outcome. ^[78]

VIII. MEASURES OF PRE-OPERATIVE ANXIETY

Practically it is very difficult to measure preoperative anxiety in elective surgery due to time restriction during and before procedure. But still there are number of objective and subjective scoring methods and questionnaires are available for its measurement. Some of important and clinically used methods are described below.

- 1. Objective Methods:** Objective methods include measures of sympathico-adrenal activity resulting due to pre-operative anxiety. indirectly assessed by blood pressure, pulse rate or skin conductance. whereas directly it can be assessed by plasma cortisol, urinary and plasma catecholamine level. ^[79,80,81,82,83] Study by Martinez *et al.* and Fell *et al.* also used urine catecholamines and plasma catecholamines respectively to measure level of anxiety. One study had claimed that adrenaline value can also be a parameter for anxiety assessment in which 20 ng/min of adrenaline in the urine is indicative value for pre-operative anxiety. ^[84]

Nisbet *et al.* observed changes in skin electrical potential throughout operative event and claimed that its record can be one measure of anxiety which varies with anxiety level and sedation. ^[85]

So, objective measurement of anxiety may be done by measurement of plasma or urine catecholamine and indirectly can be done by measure by change in vital parameters throughout the procedure. ^[86]

- 2. Subjective Methods:** It includes Spielberger's State Trait Anxiety Inventory (STAI), ^[87] Amsterdam Preoperative Anxiety Information Scale (APAIS) ^[88], Hospital Anxiety and Depression Scale (HADS) ^[89], Multiple Affect Adjective Check List (MAACL), Visual Analogue Scale for Anxiety (VAS-A), Hamilton anxiety rating scale (HAR) ^[90].

IX. STRATEGIES TO MITIGATE PREOPERATIVE ANXIETY AND IMPROVE POSTOPERATIVE OUTCOMES

Management of preoperative anxiety can be done by medical as well by nonmedical interventions. ^[91] Generally, medical therapy is used by anaesthesiologist like benzodiazepines due to lack of time, whereas nonmedical therapy includes various collaboration methods done by either anaesthesiologists and surgeons or nurses. There are much research carried out on nonmedical therapy for pre-operative anxiety; among those, music and patient's education regarding procedure are found effective interventions. ^[92, 93] Inadequate information regarding procedure can lead to dis-satisfaction to the patient's concerns and they starts being more anxious. ^[94]

- 1. Communication Session:** Ideal communication session in preoperative period is neither just giving information of surgical procedure and its risk factor, nor giving detailed knowledge in medical terms. Communication session is a simple talk to the patients for his/her convincement which differs person to person, here only focus is given to the patient's real need or doubts. ^[95] Communication session needs calmness, and better communication skill of staff, sometimes it become more efficient when patients found similar culture, language, or religious background as of them. ^[96]

Efficient pre-operative counselling by communication play role in decrease of moderate to severe level of anxiety and helpful to create homely atmosphere. ^[97, 98] There are many opportunities i.e., anaesthesiologist's visit, the surgeon's counselling, and the nurse's attention to develop proper communication to the patients, which can be helpful to take patients in confidence, dispel all the doubts and helpful in management of anxiety levels. Maghsoodi, Zarea , Haghizadeh (2014, p. 1) and Nikumb *et al.* (2012, p. 19)

found strong relation between therapeutic communication and reduction of the severity of anxiety, it can also speed up the recovery of the patients when it is conducted in purposeful manner.

Here, Davis-Evans (2013, p. 359) stated that better communication to the patients can be achieved by individual's humor which will help in better relationships, friendly atmosphere, positive aspect towards pain and surgical procedure.

- 2. Music therapy:** Music is clinically proven therapy for reduction of anxiety which is a very simple and easily accessible. ^[99 100] there are some supportive studies which give clinical data (Self measured relief in anxiety in cataract surgery) regarding effectiveness of music therapy in pre-operative anxiety. ^[101] It was also reported that sympathetic nervous action can be reduced and individual feel relaxed emotionally as well physically just by listening to music. ^[102] It was observed that patients mind can be distracted by auditory stimuli from additional annoying noises in clinical setting by playing calm and soothing music. ^[103] In addition, It was observed that exposure to music can significantly reduce consumption of analgesic-sedative drugs ^[104], relieve postoperative pain ^[105] and improve patient satisfaction ^[106], and ultimately reduction in anxiety level. Here, the genres and types of music also should be considered like classical Western music was found clinically more effective than Turkish and soft rock music to manage pre-operative anxiety. ^[107] Choice of music may differ in different generation, but in case of pre-operative anxiety opinion of psychologist is must regarding selection of type and tracks of music. As, in recent are all the people are used to listen music by their own phone, still ideal strategies regarding music therapy will become worthy for further research.

Kushnir, Friedman, and Ehrenfeld (2012, p. 121) found that playing favourite music just before a caesarean section is very effective in reduction of anxiety. They gave reasoning that music may direct the patient's attention towards more soothing and relaxing atmosphere which will help in mental relaxation and give a way to negative thought. Here, negative emotions can stimuli the action of fight or flight and makes blind decision, whereas the positive mind set can think in positive way and can broaden the scope of attention, cognition, and action.

Johnson, Raymond and Goss (2012, p. 154) found positive effect of music therapy for pre-operative anxiety and also claimed this therapy as an easily available and can be conducted at very low cost. Wakim, Smith and Guinn (2010, p. 231) found effectiveness of music therapy on vital parameters and it lowered the level of anxiety, but in this study patients were asked to listen the music of their own choice.

- 3. Preoperative Education:** Pre-operative education majorly addresses the patient's doubts and dealing with their negative feelings. Priorly patients were asked to express their feeling in private atmosphere and then their problems were addressed with very calm and supportive manner without judgement of their attitude.

Guo, East and Arthur (2012, p. 58) suggested effectiveness of preoperative education in reduction of the levels of anxiety; Similarly, Pereira, Figueiredo-braga and Carvalho (2016, p. 733) proved that empathetic approach towards the patients will help in reduction and management of pre-operative anxiety with good recovery and satisfaction.

Some supportive study i.e. Kalogianni *et al.* (2016, p. 447) observed reduction in anxiety with minimal postoperative complications due to proper pre-operative education by medical staff and Maheshwari and Ismail (2015, p. 197) claimed lower level of anxiety in patients having details education from anesthetists than having education from other paramedics. Some study found good control on anxiety by providing recorded audiotape of detail of procedure before cardiac surgery.^[108] However, Instable results were also found in a review of randomized controlled trials in cardiac surgical patients.^[109]

- 4. Family Support and Medication:** Guo, East, and Arthur (2012) declared that good supportive family- friends and paramedics along with anxiolytic or antidepressant medicines will be helpful in anxiety, but risk and potential side effects of drugs can't neglect here.

Other strategies like essential oils, television, and using other relaxation techniques have been also found effective to manage anxiety and can be used as an alternative therapy as well, but very few clinical proven data is available for such therapies.^[110, 111]

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