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Effect of Video Assisted Breathing Technique on Preoperative Anxiety Among Patients Undergoing Elective Surgeries in a Secondary Hospital in Chümoukedima, Nagaland, India

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ABSTRACT

INTRODUCTION: Surgery is a traumatic treatment and the preoperative period is a stressful event. This study was conducted to determine the effectiveness of Video Assisted Breathing Technique on preoperative anxiety among patients undergoing elective surgery.
METHODS: A quasi-experimental study was conducted among patients undergoing elective surgery at surgical, labour and private wards of a secondary hospital. Using a non-probability purposive sampling technique, 40 participants were recruited who were randomly assigned to experimental and control groups. Video Assisted Breathing Technique and the Amsterdam Preoperative Anxiety and Information Scale (APAIS) were used as the study intervention and data collection instrument. T-test for paired and unpaired samples were used to determine the difference in the anxiety scores. Fisher's exact test was used to find the association of anxiety with the demographic and clinical variables.
RESULTS: Majority of the participants were found to have mild [14(35%)] to moderate [19(48%)] preoperative anxiety. There was a statistically significant difference between the pre-test and post-test anxiety scores in the experimental group ($p<0.05$) while there was no significant difference between the experimental and control groups (p value >0.05). Significant association was found between the anxiety level with previous experience of surgery (p 0.041, f=6.083, df=2) and the number of past surgery (p= 0.048, f=8.191, df=4).
CONCLUSION: Video Assisted Breathing Technique was found to be effective in reducing preoperative anxiety in the experimental group of patients undergoing elective surgeries. It is thus recommended for nurses to utilize evidence-based non-pharmacological interventions for reducing patients' anxiety in the preoperative period.
Keywords: Anxiety, Elective Surgery**,** Pre-Operative Period, Pre-Operative anxiety, Video Assisted Breathing Technique.

INTRODUCTION

Anxiety can be defined as an aversive feeling which arises from the anticipation of a potentially unfavorable, risky, or unpleasant event or outcome. It is characterized by negative emotional reactions and intense physical manifestations. [1] The concept of

preoperative anxiety refers to an unpleasant feeling of worry in a patient undergoing surgical treatment. It is usually related to the perception of the forthcoming operation or anesthesia, pain, hospitalization, and disease itself. [2] Perioperative anxiety is described as a vague, uneasy feeling in which the exact causes are often nonspecific and unknown to the individual but known to cause the body to react with undesirable hemodynamic as a consequence of sympathetic, parasympathetic and endocrine stimulation. [3]

Surgery is a traumatic treatment that is usually associated with bleeding, pain, the risk of morbidity or sometimes death.[3] Research has established that waiting for surgery or invasive procedures is stressful and anxiety aggravating and affects both physiological and psychological parameters.[2] It has also been reported that concerns about the operation results, separation from family, postoperative pain anticipation, loss of independence, and fear of surgery and death aggravates pre-operative anxiety.[4]Factors such as younger age, female gender, higher educational status, unemployed status, marital status, and surgery related factors such as types of anesthesia, not having exposure to previous surgery or anesthesia, not being informed about the type of surgery or anesthesia, adverse events in previous surgery and higher grade of surgery were associated with higher anxiety scores.[5,6,7]

Preoperative anxiety is a matter of concern for many health professionals including anesthesiologists and surgeons, and nurses at the recovery unit, Intensive Care Unit, and ward. It is considered a major morbidity factor during and after the surgical process. [8]

Preoperative anxiety is prevalent in patients undergoing elective surgery. [3] The prevalence of preoperative anxiety varies widely and has been reported to range from 11-80% among adult patients. [3, 6,9,10,11] Due to the high prevalence and adverse effects of preoperative anxiety, treatment is often necessary. Two types of interventions for preoperative anxiety are identified namely pharmacological and non-pharmacological. Pharmacological interventions include sedatives and anti-anxiety drugs. Midazolam, diazepam, ketamine, and fentanyl are the most common anxiolytics. [8] As pharmacological treatments have adverse effects such as breathing problems, drowsiness, interfering with anesthetic drugs, and prolonged recovery, non-pharmacological interventions are becoming more commonly used. [12]

Complementary integrative medical therapies including music, massage, guided imagery, and deep breathing have been proposed to minimize stress and pain in surgical patients. [13] These therapies are thought to be effective by evoking the relaxation response through stimulation of the parasympathetic nervous system and engagement of the patient in the healing process. Relaxation and deep breathing, particularly, have been shown to reduce pain, anxiety, and "tension-anxiety" in hospitalized patients. [13,14] A comprehensive review on the non-pharmacological methods such as cognitive-behavioral therapy, music therapy, pre-operative preparation video, aromatherapy, hypnosis, guided imagery relaxation therapy, and massage, focusing on more recent evidence provided by clinical studies was done. The reviewed clinical evidence on the mentioned methods showed the efficacy of non-pharmacological interventions for the treatment of preoperative anxiety among patients of different ages and types of disease and surgery. [12]

Mulki et al [15] conducted a quasi-experimental study to determine the effectiveness of deep breath relaxation techniques and music therapy on reducing anxiety level among preoperative patients. 42 preoperative patients selected by non-probability consecutive sampling technique were divided into two groups. 21 respondents in the intervention group were given deep breath relaxation technique and music therapy, while 21 respondents in the control group were given only music

therapy. The result shows that the mean difference in the level of anxiety in the intervention group was 16.41 while the mean difference in the anxiety levels of the control was 6.38. This indicated that deep breath relaxation techniques and music therapy effectively lowered anxiety level in preoperative patients. Pardede et al [16] also reported a significant effect of deep breathing relaxation techniques with lavender aromatherapy on preoperative patient anxiety.

Yilmaz et al [17] also conducted an experimental study with a control group research model to study the effect of progressive breathing relaxation training on preoperative anxiety and surgical stress response using the State Anxiety Scale (SAI) on a sample of 78 randomly selected participants. Surgical stress response was determined by measuring vital signs, blood glucose, and cortisol levels. The experimental group of 39 received progressive breathing relaxation training before surgery and the control group of 39 received only the usual preparation. The result showed that the difference between the vital signs of the two groups was not significant ($p > 0.05$), State Anxiety Score of the experimental group decreased in the postoperative first day and blood glucose and plasma cortisol levels were low on the 4th postoperative day. The difference between the plasma cortisol levels of the groups on the 4th postoperative day was significant ($p < 0.05$). This study provided evidence to support the use of breathing relaxation technique due to its positive effect in reducing even the surgical stress response and anxiety.

Based on the evidence that anxiety is prevalent among pre-operative patients, that non-pharmacological interventions are also found to be effective in decreasing the preoperative anxiety levels and the researchers' observations in the hospital setting where the only documented intervention for relieving preoperative anxiety in patients posted for elective surgeries was the prescription of a pharmacological agent on the night before surgery, a non-pharmacological intervention of Video Assisted Breathing Technique was proposed to reduce anxiety among patients undergoing elective surgeries.

Aim: To evaluate the effectiveness of a Video Assisted Breathing Technique implemented into the preoperative setting of surgery to reduce patient's anxiety.

Research Hypotheses

H_1: There will be a significant difference in the preoperative anxiety scores of the experimental group before and after the Video Assisted Breathing Technique at a level of significance $p<0.05$.

H2: There will be a significant difference in the preoperative anxiety scores between the experimental and control groups at a level of significance $p <0.05$.

H3: There will be significant association between the preoperative anxiety levels with the demographic and clinical variables at a level of significance $p<0.05$.

MATERIALS & METHODS

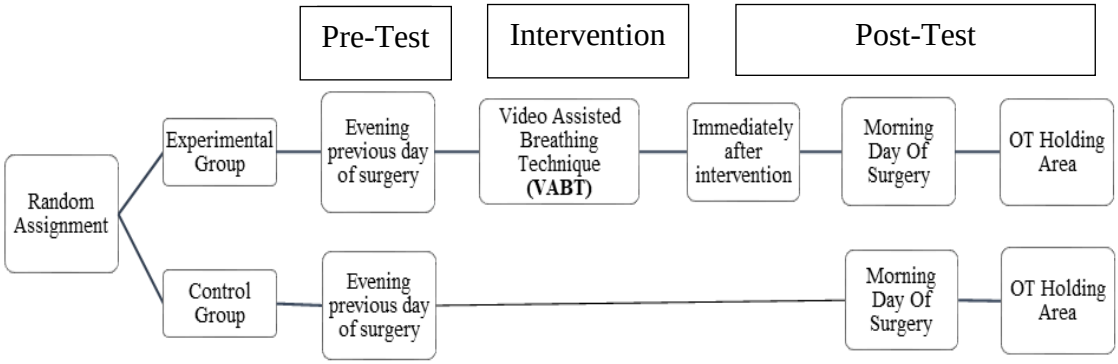
A quasi-experimental study was conducted among patients undergoing elective surgery at surgical, labour and private wards of a secondary hospital. Using a non-probability purposive sampling technique, 40 participants were recruited for the study who were randomly assigned to experimental and control groups. Patients who were more than 18 years of age, admitted at least 1 day before the scheduled elective, uncomplicated abdominal, gynecologic and urologic surgeries were included in the study. Patients who had a diagnosed Psychiatric disease, had taken alcohol or opioids within the last 1 month prior to the surgery, were taking anti-depressants, anti-anxiety or sedative medications or were suffering from malignant conditions were excluded from the study.

Video Assisted Breathing Technique of the Four Square or Box Breathing Technique and the Amsterdam Preoperative Anxiety

and Information Scale (APAIS), a standardized, validated, freely available scale specifically attuned to the preoperative situation, [18] were used as the study intervention and data collection instrument. Construct validity of the APAIS determined in a previous study by factor analysis resulted in two factors: anxiety and information requirement. The correlation between the two factors was 0.31 (hypothesized that the correlation between the two factors will be <0.30). Concurrent validity obtained by correlating the anxiety items on the APAIS with the gold standard for measuring anxiety that is, the State Trait Anxiety Inventory (STAI) was reported to have a moderately positive correlation (0.74). Cronbach's alpha was found to be 0.86 for the anxiety scale and 0.68 for the need for information scale. [9] Test-retest reliability of the English version for anxiety was reported to be 0.91 and 0.62 for the need for information scale**.** [19]

The interventional video and APIAS were translated and back translated into 3 local languages- Nagamese, Assamese and Hindi. Feasibility of the study was tested by conducting a pilot study prior to the main study. The study was conducted after getting approval from the Nursing Research Committee and the Institutional Research and Ethics Committees. Written informed consent was obtained from every participant who were assured of the confidentiality of the information provided by them. Anonymity of the study participants was maintained by using code numbers. Data was collected on the evening before the scheduled day of surgery, the morning on the day of surgery and at the holding area of the Operation Theatre before being shifted into the OT for both the groups. For the experimental group, data was also collected immediately after administering the intervention on the evening before the scheduled day of surgery (Figure 1).

Figure 1. Schematic representation of the Research Design



STATISTICAL ANALYSIS

The demographic and clinical variables were analyzed using frequency and percentages, T- test for paired samples was used to test the mean difference in the pre and post-test anxiety scores for the experimental group, while t-test for unpaired samples was used to determine the difference in the anxiety scores between the experimental and control groups. Fisher's Exact Test was used to test the association between the study findings with the demographic and clinical variables.

RESULT

Section 1. Demographic and clinical variables

Table No. 1.1: Frequency Distribution of the Study Participants Based On demographic variables. (n=40)

DEMOGRAPHIC VARIABLES	Experimental group		Control group		Total	
	Frequency	%	Frequency	%	Frequency	%
Age						
18 -39 years	11	55%	9	45%	20	50%
40 -59 years	7	35%	8	40%	15	37.5%
60 years and above	2	10%	3	15%	5	12.5%
Gender						
Male	7	35%	5	25%	12	30%
Female	13	65%	15	75%	28	70%
Marital Status						
Married	17	85%	17	85%	34	85%
Unmarried	3	15%	3	15%	6	15%
Monthly Family Income						
<=10000	4	20%	9	45%	13	32.5%
10001-49999	10	50%	8	40%	18	45%
>=50000	6	30%	3	15%	9	22.5%
Educational status						
Illiterate	4	20%	4	20%	8	20%
Under Graduate	13	65%	15	75%	28	70%
Graduate and above	3	15%	1	5%	4	10%
Religion						
Christian	16	80%	16	80%	32	80%
Hindu	4	20%	4	20%	8	20%

The above table No. 1.1. shows that majority of the participants in both experimental and control groups were in the age group of 18-39 years (20,50%), were females (28,70%), married (34,85%), had monthly income ranging from Rs. 10001 to 49999 (18, 45%), Undergraduates (18,70%) and Christians (32,80%).

Table No. 1.2: - Frequency Distribution of the study participants based on the clinical variables (n=40)

CLINICAL VARIABLES	Experimental group		Control group		Total	
	FREQUENCY	%	FREQUENCY	%	FREQUENCY	%
Diagnosis						
Gastrointestinal	9	45%	6	30%	15	37.5%
Genitourinary	7	35%	10	50%	17	42.5%
Gynaecology	4	20%	4	20%	8	20%
Type of surgery						
General surgery	4	20%	4	20%	8	20%
Laparoscopic	10	50%	7	35%	18	45%
Urologic surgery	6	30%	9	45%	14	35%
Type of anaesthesia						
General Anaesthesia	15	75%	15	75%	30	75%
Spinal Anaesthesia	4	20%	5	25%	9	22.5%
Others	1	5%	0	0%	1	2.5%
Co morbidities						
Yes	3	15%	1	5%	4	10%
No	17	85%	19	95%	36	90%
Previous experience of surgery						
Yes	8	40%	5	25%	13	32.5%
No	12	60%	15	75%	27	67.5%
Time since last surgery						
5 years and less Than 5 years	2	25%	2	40%	4	30%
More than 5 years	6	75%	3	60%	9	70%
Previous information about breathing exercise						
Yes	0	0%	0	0%	0	0%
No	20	100%	20	100%	40	100%
Anxiolytic						
Yes	11	55%	14	70%	25	62.5%
No	9	45%	6	30%	15	37.5%

The above table no. 1.2. shows that majority of the participants in both experimental and control groups had genitourinary problems (17, 42.5%), were undergoing laparoscopic surgeries (18,45%) under general anesthesia (30, 75%), had no comorbidities (36,90%), no previous experience of past surgeries (27, 67.5%) nor had they received any prior information about breathing exercises (100%). Majority of the participants were prescribed anxiolytics in the preoperative period (25, 62.5%).

Section 2: Patterns of Pre-Operative Anxiety levels

Fig. 2.1.Pre-operative anxiety levels

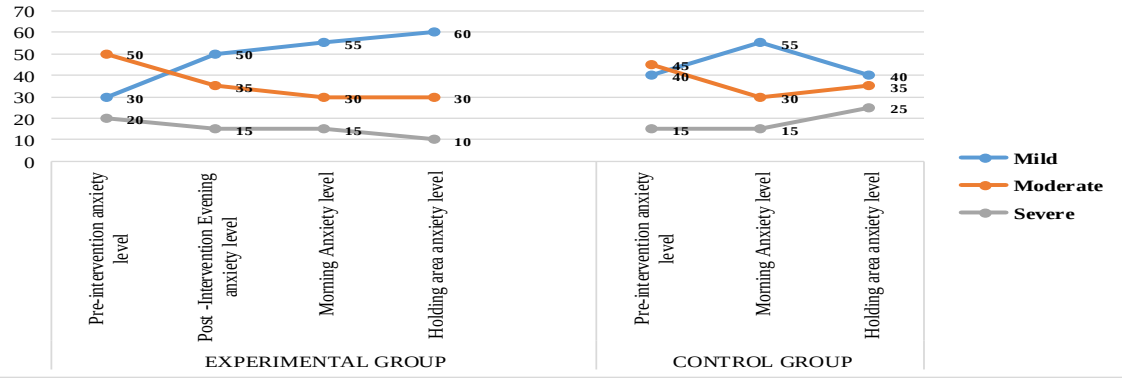


Fig. 2.1. shows the pattern of anxiety levels in the experimental and control group measured at pre-intervention, immediate post intervention, morning on the day of surgery and holding area of the OT immediately before the surgery. In the experimental group, the number of patients reporting severe to moderate levels of anxiety demonstrated a decreasing trend while the number of those reporting low levels of anxiety increased after the intervention.

The levels of anxiety showed a variable trend in the control group with a larger number reporting mild anxiety on the morning of the day of surgery (55%) which however reduced to the same number as the evening before in the holding area (40%). There was a slight increase in the number of patient reporting severe anxiety from 15 % on the evening before the day of surgery to 25% in the holding area.

Section 3: Test of Difference in mean anxiety scores

Table no. 3.1. Paired t-test comparing the means of the pre-test (evening before intervention) to post-test in the experimental group (immediately, morning and at OT holding area)

Time of measurement	Mean	S. D	Mean of the difference	S.D of the difference	Standard error of the mean	T calculated	Degree of freedom	P value*	Significance*
Pre-test	15.20	5.944	2.350	4.464	0.998	2.354	19	0.029	Significant
Post-test 1: Immediately after intervention	12.85	5.770							
Pre-test	15.20	5.944	2.650	5.081	1.136	2.332	19	0.031	Significant
Post-test 2: Morning on day of surgery	12.55	6.057							
Pre-test	15.20	5.944	3.800	5.085	1.137	3.342	19	0.003	Highly significant
Post-test 3: At OT holding area	11.40	5.335							

p<0.05 is considered significant
P<0.01 is considered highly significant

The above table shows that there is a statistically significant difference in the mean anxiety scores measured before and immediately after the intervention (*p* 0.029, t=2.354, df=19) and on the morning of the day of surgery after the intervention in the experimental group (p 0.031, t=2.332, df=19). A highly significant difference in the mean anxiety scores measured before the intervention and in the holding area just before being transferred to the operation theatre, after the intervention, was also found in the experimental group (p<0.003, t=3.342, df=19). However, no statistically significant differences in the level of anxieties were found between the experimental and control groups.

Section 4: Test of Association between the pre-operative anxiety levels and the research variables (demographic and clinical variables)

Association between pre –operative anxiety levels and the demographic and clinical variables using the Fisher's Exact Test revealed no significant association between the level of anxiety with age, gender, marital status, monthly income, educational status, religion, diagnosis, types of surgery, types of anesthesia, time since last surgery and prescription of pre-operative anxiolytic. However, a significant association was found between the level of anxiety with the previous experience of surgery (p 0.041, *f*=6.083, df=2) and the number of past surgery (p= 0.048, f=8.191, df=4).

DISCUSSION

In our study, out of 40 participants, majority had mild 14(35%) to moderate 19(48%) anxiety and 7 (18%) had severe anxiety before the video assisted intervention. Post intervention, 22 (55%) had mild, 12 (30%) moderate and 6(15%) had severe anxiety in the morning on the day of the surgery while 20 (50%) had mild, 13 (33%) moderate and 7 (18%) severe anxiety in the OT holding area before the surgery. The study findings reveal that majority of the patients undergoing surgery had mild to moderate anxiety levels and that the anxiety levels were variable. This is consistent with what is reported in literature that, patients undergoing surgery experienced low to moderate levels of anxiety [5,6] and that there are also varying levels of anxiety among preoperative patients. [6,10] However, studies done by Acharya et al [6] Dhungana et al, [10] and Sankar L [11] reported that majority of the preoperative patients had moderate to severe anxiety ranging from 51.81%, 57.3 % to as high as 65% of the study participants reporting severe anxieties in the preoperative period. Descriptive exploratory studies may thus be warranted in order to determine the factors that may have contributed to the lower levels of anxiety reported by the participants in the present study population and the coping mechanisms utilized by them.

A statistically significant difference was found between the pre and post intervention anxiety scores in the experimental group immediately after the intervention (2.350 ± 4.464, p<0.05), the morning on the day of surgery (2.650±5.081, p<0.05) and in the OT holding area just before the surgery (3.8±5.085, p<0.001). This finding is consistent with the results of the study conducted by Pardede et al [16] where they reported a significant effect of deep breathing relaxation techniques with lavender aromatherapy on the anxiety of pre-operative patients at Martha Friska Brayan General Hospital Medan. Our study findings also support the available evidence that Video Assisted Breathing Exercises/Techniques are effective in reducing preoperative anxiety levels among adult patients undergoing surgery**.** [6,20.21] It was however found that 100 % of the study participants had not received any form of instructions about breathing techniques for reduction of pre-operative anxiety though majority had received pre-operative anxiolytics (62.5%). It is thus recommended for nurses and other health personnel to provide information about the surgery, anesthesia and also explore and apply diverse evidence- based non-

pharmacological measures to reduce anxiety in the preoperative period.

There was however, no statistically significant difference found between the experimental and control groups in terms of reduction in anxiety score measured at different time points after the intervention. This may be due to the administration of anxiolytics in the preoperative period wherein a larger majority of the participants in the control group (14, 70%) had received pre-operative anxiolytics as compared to the experimental group (11, 55%). It may be thus helpful to study and draw comparison among those receiving pre-operative anxiolytics and those who did not receive pre-operative anxiolytics as well as the various non pharmacological approaches in order to determine which method best suit the contextual cultural background of the population and is more efficacious in the alleviation of pre-operative anxiety.

While other studies have reported that younger age [6,7] female gender,[6,7] unemployed status,[5,6] higher level of education,[5,6] higher grade of surgery,[6] surgeries performed under general or spinal anesthesia, [7] no previous exposure to anesthesia, [7] not being informed about the type of surgery or anesthesia, adverse events in previous surgery and higher grade of surgery as being associated with higher anxiety scores, [6,7] the current study findings did not reveal any association between preoperative anxiety levels with the demographic and clinical variables, such as age (p=0.850), gender (p=0.700), marital status (p=0.450), monthly family income (p 0.400), educational status (p = 0.525) , religion (p = 1.000), diagnosis (p=0.127), types of surgery (p=0.068), types of anesthesia (p= 0.609), and time since last surgery (p=0.050). This lack of finding of any significant association in the present study may be due to the small sample size and other possible sociocultural factor like social support [22] which were not considered in the present study. However, not having previous experience of surgery (p= 0.041) and lesser number of past surgeries (p= 0.048), were found to be associated with the pre-operative anxiety levels, supporting findings reported in previous studies. [5,7]

CONCLUSION

The study findings add to existing knowledge that majority of the preoperative patients have variable levels of anxiety. The study findings also add to available evidence that non-pharmacological interventions such as Video assisted breathing technique are effective in reducing anxiety among patients undergoing elective surgery. It is thus recommended that nurses adopt, teach and promote the utilization of non-pharmacological interventions by patients in the preoperative period to reduce the experience of preoperative anxiety.

Implications for practice:

In the present study, majority of the pre-operative patients reported experiencing varying levels of anxiety. The participants in the experimental group also benefited from Video Assisted Breathing Technique taught in the pre-operative period to relieve pre-operative anxiety. Nurses may thus promote the utilization of evidence-based non-pharmacological interventions such as breathing exercises in clinical practice to reduce anxiety among pre-operative patients.

Limitations:

The major limitation of this study was the small sample size which is 40 (20 in the experimental arm and 20 in the control arm) which limits the generalizability of the findings and so it is recommended to incorporate a larger sample size in future studies so that the results will be more scientifically robust.

Recommendations

Future studies aimed at comparing the efficacy of the non-pharmacological interventions for reducing pre-operative anxiety can be undertaken with larger sample size for wider generalization.

Exploratory or ethnocentric studies may also be helpful in understanding the factors which may be contributing to the lower levels of pre-operative anxiety reported in this population.

Declaration by Authors

Ethical Approval: Approved

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