

Effect of Alternate Nostril Breathing Exercise on Preoperative Patients' Anxiety, Blood Pressure and Heart Beats.

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Abstract

Background: Surgery is a therapeutic intervention that may have a threats to the integrity of human's body and soul. It can cause physiological and psychological responses for patients. The psychological response that may affect preoperative patients is anxiety which characterized by increased pulse and breathing frequency, uncontrolled hand movements, moist palms, restlessness, asking the same questions repeatedly, difficulty sleeping and frequent urination. **The aim** of the study was to evaluate the effect of alternate nostril breathing exercise on preoperative patients' anxiety, blood pressure and heart beats. **Research design:** Quasi- Experimental research design was utilized to achieve the aim of the study. **Setting:** This study was conducted in general surgery units for both males and females at Benha University Hospital. **Sample:** A purposive sample of (100) adult preoperative patients was involved in the study in the above-mentioned place during six months was selected in this study. Of both sexes (males and females), their ages ranged from 20 to less than 70 years and ready to participate in the study. **Tools of data collection:** Three tools were used, **I:** Structured interviewing questionnaire which consisted of three parts to assess **A)** Patients' personal data. **B)** Patients' health history. **C)** Patients' knowledge about preoperative stage and alternate nostril breathing exercise **II:** Beck Anxiety Inventory Scale and **III** patient's parameters (blood pressure and pulse measurement) **Results:** showed that there was statistically significant reduction in median of overall anxiety scores among study group (16.0%) after practicing Alternate Nostril Breathing exercise compared to control group (22.0%) as ($P < 0.01$) and showed that there was statistically improvement in measurements of blood pressure and pulse among study group after practicing Alternate Nostril Breathing exercise as ($P < 0.002$). **Conclusion:** practicing of Alternate Nostril Breathing exercise has a positive effect on decrease level of anxiety and regulate blood pressure and pulse among preoperative patients. **Recommendation:** The study recommends that; health care instructions for patients undergoing surgical operations to teach them importance of Alternate Nostril Breathing exercise, and how to practice it.

Key words: preoperative anxiety, blood pressure, pulse, Alternate Nostril Breathing

Introduction

Surgery is a therapeutic intervention that may have a threats to the integrity of human's body and soul. It can cause physiological and psychological responses for patients. The psychological response that may affect preoperative patients is anxiety which characterized by increased pulse and breathing frequency, uncontrolled hand movements, moist palms, restlessness, asking the same questions repeatedly, difficulty sleeping and frequent urination (**Idris, ۲۰۲۲**).

Most of surgical patients experience anxiety due to fearing of bleeding, pain and the risk of morbidity and mortality which may result in feelings of tension, nervousness, fear and high autonomic activity with varying degree of intensity, and cause patients undergoing intended surgical operation to refuse any intervention or procedures (**Tarigan, ۲۰۲۲**).

As a result of the anxiety the heart contracts more strongly and the volume of blood will be redistributed causing vasoconstriction or narrowing of blood vessels in the skin, stomach and kidneys. Increased blood volume will increase cardiac output and blood flow to the

respiratory muscles resulting in tension and tense, tachypnea in addition to increased blood pressure so that if surgery is still performed it will cause difficulties in stopping bleeding and even after surgery will interfere with the healing process (**Pardede et al., ۲۰۲۰**).

The degree to which each patient manifests anxiety related to future experiences depends on many factors. Such as age, gender, type and extent of the proposed surgery, previous surgical experience, and personal susceptibility to stressful situations. Patients with high levels of anxiety require higher doses of anesthetic induction agents and recover poorly. If unrecognized, prolonged anxiety creates stress which may subsequently harm the patient and delay recovery (**Wondmieneh, ۲۰۲۰**).

Practicing of Alternate Nostril Breathing by sitting in a comfortable position, lift right hand up toward nose, closing the right nostril with thumb finger, exhale completely through the left nostril. Then inhale deeply through the left nostril, close the left nostril with ring and little finger, release the right nostril, exhale slowly and completely through the right nostril. Inhale deeply through the right nostril then close the right nostril and exhale through the left nostril, this is ۱ round of alternate nostril breathing. Practice of ۲۰

minutes (°minutes of £ phases and with 3· seconds rest between each phase). The phase formed of ° round / min. Immediately after the procedure the parameters recorded again within ° min (**Udaykumar et al., 2021**).

Alternate Nostril Breathing has been shown to alter autonomic activity. Alternate Nostril Breathing training harvests a decrease in basal sympathetic tone. Slow and deep breathing has a calming effect on the mind and helps an individual to de-stress and may also exert profound physiological effects on pulmonary, cardiovascular, and functions of the brain (**Tripathy & Sahu, 2019**). The nurse told the patients refrain from ingestion of caffeine 2 hours prior to study. The procedure explained to the patients and then the patients relax for 1· minutes in a temperature-controlled environment before the procedure (**Singh et al., 2020**).

Significance of the study

Surgery is often the only therapy that can alleviate disabilities and reduce the risk of death from common conditions. Every year, many millions of people undergo surgical treatment, and surgical interventions account for an estimated 13% of the world's total disability-adjusted life years (**World Health Organization, 2023**). The prevalence of preoperative anxiety among patients undergoing various surgeries around 60% to 90% (**Dhungana et al., 2019**). Hypertension is the commonest avoidable medical reason for postponing surgery (**Tait & Howell, 2021**).

The number of patients undergoing general surgeries in the general surgery unit at Benha University Hospital in the year (2022) was about 1·45 patients (**Benha University Hospital Statistical Office, 2022**). Alternate Nostril Breathing has been shown to alter autonomic activity. Pranayama training produces a decrease in basal sympathetic tone, increases parasympathetic activity, has a calming effect on the mind and helps an individual to de-stress. This calming effect may also exert profound physiological effects on pulmonary, cardiovascular, and mental functions of the brain (**Shah & Kothari, 2019**). So, this study will explore the effect of Alternate Nostril Breathing a exercise on blood pressure and level of anxiety among the preoperative patients.

Aim of the study:

The study aimed to evaluate the effect of alternate nostril breathing exercise on preoperative patients' anxiety, blood pressure and heart beats.

Research hypothesis:

H¹- The level of anxiety among preoperative patients could be significantly reduced after implementing the exercise than before.

H²- The measurements of blood pressure and pulse rate could be reduced after implementing the exercise than before.

Subject and Methods

Research design:

Quasi- Experimental research design was utilized to achieve the aim of the study.

Study setting:

The study was conducted in general surgery units for both males and females at Benha University Hospital. General surgery unit for females located in the 3rd floor of surgical building and general surgery unit for males located in the 2nd floor of surgical building.

Sample:

A purposive sample of (100) adult preoperative patients. Was involved in the study divided into two equal groups:

Group (A): Control group who received routine nursing care only.

Group (B): Study group who received breathing exercise instructions and routine nursing care.

Tools for data collection

Tool I: Structured interviewing

questionnaire:

This tool was designed by the researcher and translated into Arabic language after reviewing recent relevant literatures and scientific references. It was adapted from **Bedaso & Ayalew, 2019**. It involved the following three parts as the following:

Part 1: Patients' personal data:

It consists of the following data:

(age, gender, occupation, educational level, residence, marital status of the patients).

Part 2: Patients' health history:

It was used to assess past and current medical history as (date and type of surgery, past surgical history).

Part 3: Patients' knowledge about preoperative stage and alternate nostril breathing exercise:

It was used to assess patient level of knowledge regarding preoperative stage as (purpose of the surgery, types of surgeries, stages of surgical procedures, meaning of preoperative stage, causes of preoperative anxiety, symptoms of preoperative anxiety and the best ways to treat anxiety). Alternate nostril breathing exercise such as (definition of exercise, benefits, tips that must be followed before practicing an exercise and how many times the exercise should be practicing per day).

Tool II: Beck Anxiety Inventory Scale:

This scale was adopted from (Quintao, et al., 2013), to evaluate patients' level of anxiety. It is a Likert scale ranging from 0-3, (0 = not at all, 1 = mildly, but it didn't bother me much, 2 = moderately – it wasn't pleasant at times and 3 = Severely – it bothered me a lot). The total score was calculated by finding the sum of the 21 items and its scores were divided into the following:

Score of 0-21 = low anxiety

Score of 22-30 = moderate anxiety

Score of 31 and above = severe anxiety

It was used two times by the researcher (before the intervention and after the intervention).

Tool III: physiological parameters (blood pressure and pulse measurement)

Blood pressure and pulse were measured two times by researcher (before the intervention and after the intervention). By the non-invasive methods of measuring blood pressure using sphygmomanometer and radial pulse was palpated at wrist of patient hand.

Tools Validity

The tools were reviewed by a panel of five experts four professors from medical surgical nursing field and one professor from the college of physical therapy field at nursing Benha University to test the relevance, clarity of tools' content, comprehension, understanding and necessary modification was done accordingly.

Reliability of tools

Reliability of knowledge questionnaire was determined using Cronbach's alpha coefficient which was 0.843 . anxiety scale (standard tool) This only proves that this tool is an instrument with good reliability.

Ethical consideration

This study was conducted after primary approval obtained from ethical committee faculty of nursing, Benha University. Then, the researcher clarified the aim and nature of the study to patients included in the study and had assuring maintaining anonymity and confidentiality of data. Patients' informed that participation was voluntary in the study and had the right to withdraw from the study at any time without any consequences. Then, verbal consent was obtained from each participants enrolled into the study. All information was gathered used for the purpose of the study.

Pilot study

It was conducted on 10 % of studied sample (10 patients) in order to test the clarity and applicability of the study tools, also to estimate the time required for each tool to be filled by the researcher as well as to identify any possible obstacles that may hinder data collection. Based on the results of the pilot study the necessary modifications were done for more applicable tools to collect data. The patients selected for the pilot study were excluded from the study subjects.

Fieldwork:

Once the permission was obtained, the researcher was interviewed with the patients to obtain consent and explain the purpose of the study, the data was collected during the preoperative phase and was carried out through six months, from the beginning of September, ٢٠٢٣ to the end of March, ٢٠٢٤ the study was conducted according to three phases:

١- Assessment phase:

Once the aim of the study was explained to the participant of patients in simple words, each participant was individually interviewed using the structured interviewing questionnaire concerning **patients' personal data** as (age , gender, occupation, educational level, residence, marital status of the patients), **patients' health history** as (date, type of surgery and past surgical history) and **patients' knowledge about preoperative stage and alternate nostril breathing exercise** as (purpose of the surgery, types of surgeries, stages of surgical procedures, meaning of preoperative stage, causes of preoperative anxiety, symptoms of preoperative anxiety and the best ways to treat anxiety). Alternate nostril breathing exercise such as (definition of exercise, benefits, tips that must be followed before practicing an exercise and how many times the exercise should be practicing per day (**Tool I**) then

patient's anxiety level was assessed with **Beck Anxiety Inventory Scale (BAI) (Tool II)**. And the blood pressure and pulse were measured (**tool III**).

٢-planning and implementation phase:

Once the initial assessment finished, an exercises program was planned and designed based on individual patients' condition needs.

- Patients who matched sampling criteria and who accepted to participate in the study divided randomly into two equal groups. Group (A): Control group who received routine nursing care only. Group (B): Study group who received routine nursing care and breathing exercise instructions.
- In control group, the researcher assessed patient's anxiety by using tool (II), and the researcher assessed patient's blood pressure and pulse by using tool (III).
- Control group received a routine hospital care by the nurse of the surgical unit
- Then the researcher reassessed level of anxiety of control group by using tool (II) and the researcher reassessed blood pressure and pulse of control group by using tool (III) after receiving of a routine hospital care.

- In study group, the researcher assessed patient's anxiety by using tool (II), and the researcher assessed patient's blood pressure and pulse by using tool (III) before practicing alternate nostril breathing exercise.
 - The researcher explained and demonstrated the exercise to the study group by using a simple booklet in Arabic language.
 - In study group, educational and practical training session were implemented for all patients, in the educational session the researcher used simple and understandable sentences. Instructions continued until learning was completed.
- ✓ The steps of alternate nostril breathing exercise that were be taught to study group:
- Sitting in a comfortable position
 - Close the right nostril with right thumb
 - Exhale completely through the left nostril.
 - Inhale deeply through the left nostril
 - Do this to the count of four seconds.
 - Close the left nostril with ring and little finger
 - Release the right nostril, exhale slowly and completely through the right nostril

- This completes a half round.
- Inhale deeply through the right nostril
- close the right nostril
- Release the left nostril, exhale through the left nostril
- This is 1 round of alternate nostril breathing.
- Practice of 20 minutes (10 minutes of 4 phases and with 30 seconds rest between each phase). The phase formed of 10 round per minute. Immediately after the procedure the parameters recorded again within 10 min (**Udaykumar et al., 2021**). You will feel immense benefits with as little as five minutes of practice, but practicing daily for up to twenty minutes offers even deeper benefits (**Kanorewala & Suryawanshi, 2022**).
- Then the researcher reassessed level of anxiety of study group by using tool (II), and the researcher reassessed blood pressure and pulse of study group by using tool (III) within 10 min after practicing alternate nostril breathing exercise for 20 minutes.

2-Evaluation phase (post exercise):

It aimed to evaluate the effect of Alternate Nostril Breathing (Nadi shodhana pranayama) on patient's anxiety level, blood

pressure and pulse. The researcher evaluated the patient's anxiety level, measuring blood pressure and pulse after performing exercise for 30 minute.

Statistical analysis

Data analysis was performed using the SPSS software (version 20). Chi-square tests were used to compare nominal variables in the two groups and compare between different periods. For comparing the mean scores in two groups were used to the independent t-tests . Pearson method was used to test correlation between numerical variables. Linear regression was used for multivariate analyses on systolic pressure as dependent factor A p-value < 0.05 was considered significant, and < 0.001 was considered highly significant.

Results:

Table (1): This table displays the personal data of the studied patients (control and study groups), where there was no statistically significant difference between the two groups. Clarifying that (0% & 4%, respectively) had $40 < 0$ years old with a mean age of (39.68 ± 0.84 & 39.44 ± 0.90) years, while (44% & 60 %) of them were females, (8% & 42%) were married. In addition, (66% & 60%) of the studied patients had an intermediate qualification. Moreover, (06% & 60 %, respectively) of them were not working. Moreover (86% & 80%, respectively) were residing in rural area.

Table (2): This table describes the medical history among the studied patients (control and study groups), where there was no statistically significant difference between the two groups. pointing out that 40% and 66%, respectively, had undergone previous surgeries. In addition, 86% and 92% were hospitalized One day before surgery, especially major surgeries among 66% and 06%, respectively, 100% of both groups didn't perform any breathing exercises while being in the hospital previously, also (8% & 4%, respectively) reported training in breathing exercises to practice before and after the operation. Moreover, 94% and 92%, respectively, performed required lab test, also 88% and 84%. Performed required radiological examination.

Table (3): reveals the comparison of patients' parameters between control and study groups, pointing out that there was no significant statistical difference between both groups pre exercises, while there was a significant statistical differences immediately post and post 30 min of exercises implementation.

Figure (1): This figure illustrates that, there was no significant changes among control and intervention groups regarding their nature of pain (p value = $0.327^{n.s}$), where (46.7% & 03.3%, respectively) reported a burning sensation.

Figure (2): This figure illustrates the comparison of total knowledge levels among control and study groups pre and immediate post of exercise implementation with no significant statistical difference pre exercise implementation, where (92.0% & 94.0%, respectively) had poor level of total

knowledge while there was a high statistical difference during immediate post exercise

period, where (12.0% & 12.0%, respectively) had good knowledge levels.

Table (1): Distribution of studied patients according to their personal data. Control group (n=30) & study group (n=30).

Patients' personal data	Variables	Control group n=30		Study group n=30		test	
		No.	%	No.	%	X ²	P value
Age (year)	20- < 30	0	10.0	10	20.0	2.2376	0.007 n.s
	30- < 40	13	26.0	14	28.0		
	40- < 50	20	50.0	20	40.0		
	50- 60	7	14.0	7	14.0		
	Mean ± SD	39.68 ± 0.84		39.44 ± 0.90		t= -1.230	0.180 n.s
Gender	Male	13	26.0	20	40.0	2.2176	0.137 n.s
	Female	27	74.0	30	70.0		
Marital status	Single	2	4.0	7	14.0	3.000	0.217 n.s
	Married	40	80.0	37	72.0		
	Widowed	8	16.0	7	14.0		
Educational level	Illiterate	2	4.0	10	20.0	6.008	0.089 n.s
	Read and write	11	22.0	7	14.0		
	Intermediate qualification	23	66.0	30	70.0		
	University qualification	4	8.0	3	6.0		
Working status	Working	22	44.0	20	40.0	2.074	0.109 n.s
	Not working	28	56.0	30	70.0		
Residence	Urban	7	14.0	10	20.0	0.638	0.424 n.s
	Rural	43	86.0	40	80.0		

Table (2): Distribution of studied patients regarding medical health history Control group (n=30) & study group (n=30).

Medical health history	Variables	Control group N=30		Study group N=30		X ² test	P value
		No.	%	No.	%		
Past history							
Had undergone any previous surgeries	Yes	20	40.0	13	26.0	2.2176	0.137 n.s
	No	30	70.0	37	74.0		
Period since undergoing surgery	> 7 months	20	100.0	13	100.0	N.A	N.A
Current History							
Time of hospitalization before surgery	One day before surgery	43	86.0	47	92.0	0.919	0.338 n.s
	Two days before surgery	7	14.0	4	8.0		

Classification of surgery	Minor	19	38.0	22	44.0	N.A	N.A
	Major	31	72.0	28	66.0		
Performed some breathing exercises while being in the hospital previously	Yes	0	0.0	0	0.0	N.A	N.A
	No	0	100.0	0	100.0		
Trained in breathing exercises to practice before and after the operation	Yes	4	8.0	2	4.0	0.709	0.400 n.s
	No	47	92.0	48	96.0		
If, Performed required lab test	Yes	47	94.0	47	94.0	0.104	0.790 n.s
	No	3	6.0	4	8.0		
The performed Lab tests	Routine blood tests	47	94.0	47	94.0	0.104	0.790 n.s
If, Performed required radiological examination	Yes	44	88.0	42	84.0	0.332	0.074 n.s
	No	7	14.0	8	16.0		
The performed radiological examination	Chest, abdominal and pelvic X ray as well as ECG	44	88.0	42	84.0	0.332	0.074 n.s

(N.A) Not applicable

(n.s) Not significant ($p > 0.05$)

ECG Electrocardiogram

Table (3): Comparison of patients' anxiety score between studied patients throughout exercise implementation phases. Control group (n=30) & study groups (n=30).

Anxiety	Control group (n=30)			Study group (n=30)			T test P value (1)	T test P value (2)	T test P value (3)
	Pre exercises	Immediately post exercises	Post 10 min of exercises	Pre exercises	Immediately post exercises	Post 10 min of exercises			
	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$	$\bar{X} \pm SD$			
Feeling numb and let down	0.94 ± 0.86	0.94 ± 0.86	0.80 ± 0.80	0.88 ± 0.84	0.06 ± 0.70	0.47 ± 0.50	-1.101 0.277 n.s	-1.127 0.261 n.s	-1.010 0.313*
Feeling hot	2.94 ± 0.23	2.94 ± 0.23	2.74 ± 0.73	2.98 ± 0.14	2.72 ± 0.40	0.47 ± 0.50	1.011 0.312 n.s	-1.011 0.313*	-1.118 <0.01**
Foot imbalance	2.37 ± 1.00	2.37 ± 1.00	2.18 ± 1.07	2.40 ± 0.94	1.87 ± 0.97	0.72 ± 0.40	0.100 0.928 n.s	-0.011 0.913*	-0.111 <0.01**
Inability to relax	2.90 ± 0.30	3.00 ± 0.00	2.80 ± 0.70	2.92 ± 0.27	2.00 ± 0.70	0.80 ± 0.40	0.121 0.913 n.s	-0.111 <0.01**	-1.110 <0.01**
Fear of bad events	2.86 ± 0.30	2.86 ± 0.30	2.78 ± 0.70	2.82 ± 0.38	2.42 ± 0.70	0.92 ± 0.27	-1.021 0.090 n.s	-1.111 <0.01**	-1.078 <0.01**
Feeling dizzy/vertigo	2.24 ± 0.78	2.24 ± 0.78	2.08 ± 0.70	2.28 ± 0.77	1.94 ± 0.73	0.74 ± 0.44	0.112 0.919 n.s	-1.101 0.268*	-1.100 <0.01**
Feeling an increased heartbeat	2.94 ± 0.23	2.94 ± 0.23	2.74 ± 0.73	2.88 ± 0.32	2.04 ± 0.70	0.80 ± 0.40	-1.021 0.319 n.s	-1.111 <0.01**	-1.111 <0.01**
Feeling unbalanced	1.74 ± 0.77	1.74 ± 0.77	1.77 ± 0.79	1.80 ± 0.72	1.44 ± 0.77	0.77 ± 0.43	0.108 0.791 n.s	-1.101 0.271*	-0.112 <0.01**
Feeling of fear or panic	2.77 ± 0.71	2.77 ± 0.71	2.48 ± 0.86	2.70 ± 0.77	1.92 ± 0.89	0.94 ± 0.23	0.187 0.860 n.s	-2.022 <0.01**	-1.101 <0.01**
Feeling nervous	1.08 ± 0.74	1.08 ± 0.74	1.00 ± 0.71	1.02 ± 0.71	1.12 ± 0.00	0.02 ± 0.50	-0.278 0.784 n.s	-1.112 <0.01**	-0.110 <0.01**
Feeling suffocated	1.22 ± 0.41	1.22 ± 0.41	1.20 ± 0.40	1.20 ± 0.40	1.00 ± 0.49	0.42 ± 0.49	-1.121 0.261 n.s	-1.121 0.261*	-0.112 <0.01**
Shaking or trembling of the hands	1.27 ± 0.96	1.47 ± 0.90	1.18 ± 0.91	1.37 ± 0.94	0.84 ± 0.84	0.40 ± 0.49	0.012 0.911 n.s	-1.121 0.261*	-0.182 <0.01**

Trembling or shaky	1.47±0.83	1.47±0.38	1.40±0.80	1.48±0.81	0.97±0.78	0.47±0.00	0.904 n.s	0.003*	<0.001**
Fear of losing control	2.74±0.73	2.74±0.73	2.48±0.78	2.70±0.08	2.17±0.87	0.94±0.23	0.722 n.s	0.002*	<0.001**
difficulty breathing	0.88±0.02	0.88±0.02	0.87±0.49	0.87±0.49	0.08±0.07	0.28±0.40	0.844 n.s	0.007*	<0.001**
Fear of death	0.94±0.93	1.32±1.01	0.92±0.89	0.97±0.94	0.78±0.81	0.42±0.49	0.916 n.s	0.001**	0.001**
Feeling extremely afraid	2.77±0.71	2.77±0.71	2.48±0.87	2.70±0.77	2.10±0.90	0.88±0.32	0.770 n.s	0.001**	<0.001**
Nausea and abdominal pain	1.70±1.11	1.70±1.11	1.70±1.07	1.77±1.04	1.14±1.03	0.72±0.49	0.781 n.s	0.010*	<0.001**
Fainting	0.70±0.23	1.72±0.99	0.90±1.28	0.70±0.32	0.40±0.19	0.07±0.23	1.000 n.s	<0.001**	<0.001**
Blushing	2.80±0.40	2.80±0.40	2.72±0.77	2.82±0.38	1.48±1.19	0.18±0.28	0.801 n.s	<0.001**	<0.001**
Hot/cold sweats	2.80±0.40	2.80±0.40	2.72±0.77	2.77±0.43	1.38±1.24	0.07±0.23	0.733 n.s	<0.001**	<0.001**
Total	41.08±7.13	37.28±0.83	39.92±8.46	41.84±0.77	32.74±1.02	11.84±2.48	0.826 n.s	0.000*	<0.001**

Not significant ($p > 0.05$)

(*) Statistically Significant at ≤ 0.05

** Highly significant ($p \leq 0.001$)

(1) P1: p value for comparing pre exercises anxiety scores between control and study groups

(2) P2: p value for comparing immediately post exercises anxiety scores between control and study groups

(3) p value for comparing post 20 min of exercises anxiety scores between control and study groups

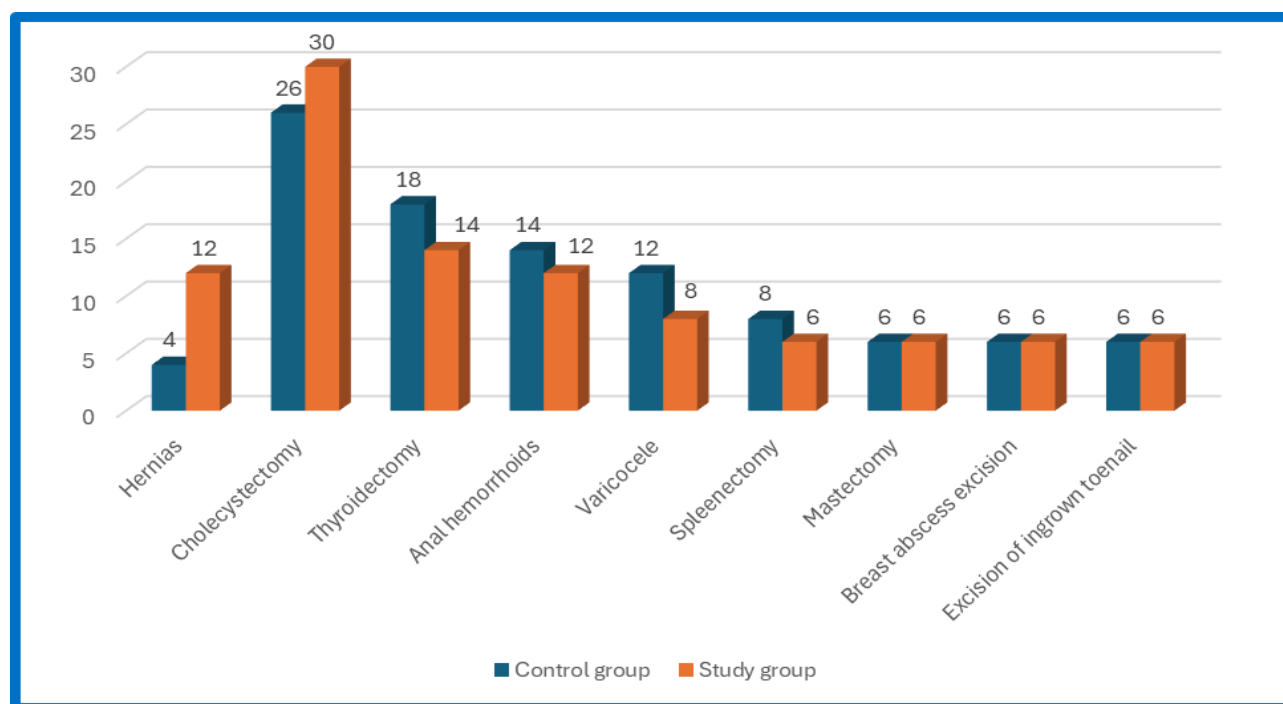


Figure (1): Distribution of types of surgical intervention among studied groups (control group=00, and study group n=00)

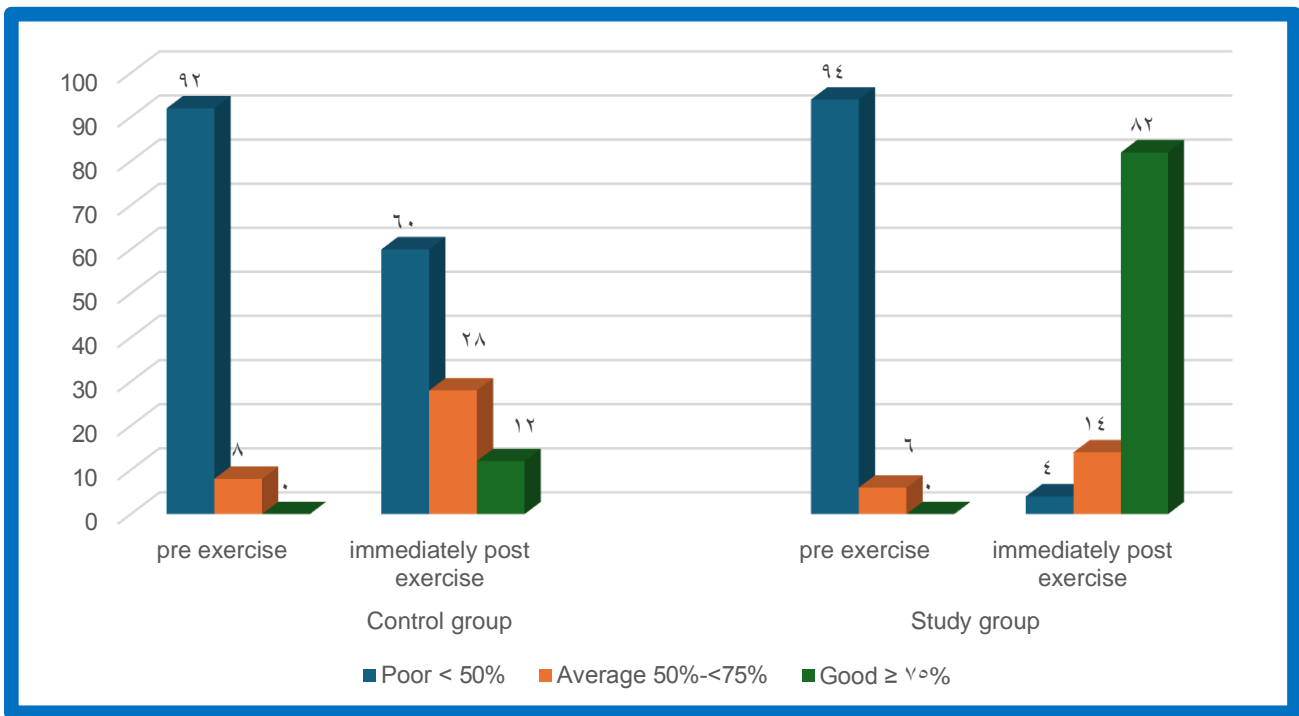


Figure (2): Comparison of total knowledge levels among studied groups pre and immediate post of exercise implementation (control group= $n=30$, and study group $n=30$)

Discussion:

preoperative anxiety usually starts 2 days before the operation and increase until the day of the procedure. This unpleasant situation affects a patient's comfort and well-being, leading to physiological and psychological changes such as tachycardia and hypertension and ultimately endangering the patient's health (Baytar, & Bollcungte, 2021)

The practice of pranayama has positive effects on measures of clinical stress and anxiety. It also influences many physiological variables and produces a positive impact on the cardiorespiratory system, where slow-paced breathing leads to decreased systolic and diastolic blood pressure (Novaes, et al., 2020). Therefore; This study highlights the

effect of Alternate Nostril Breathing exercise on blood pressure and anxiety among preoperative Patients.

Part 1: Demographic characteristics of the studied patients

The results of the present study revealed that more than one third of preoperative patients in study group between forty to less than fifty years old, and about half of control group aged between thirty and less than forty. This is in the line with the study by (Caumo et al., 2015) on risk factor for preoperative anxiety in adults, which reported that age between thirty and forty-five years was associated with higher preoperative anxiety. This result is inconsistent with the study conducted by (Nigussie, Belachew, & Wolancho, 2019),

which reported that the presence of preoperative anxiety among patients aged fifty to fifty-nine years.

Regarding gender, the present study showed that females were more prevalent in the studied subjects. This result is consistent with the study conducted by (Wondmieneh, 2020) on preoperative anxiety among adult elective surgery patient in North Wollo Zone,

Northeast Ethiopia, we found that female patients experienced a higher frequency of preoperative anxiety than male patients. Also, in agreement with the study conducted by Abd El Gwad El kalashy & Masry, (2018) in Egypt, which reported that most of mulin subieces in both groups were females. This discrepancy may be due to womens sitive to feared events and differences in hormone fluctuations. In addition, feme easily express their anxiety than men, and separation from the family affects wome more

Couseeming marital status, the present study revealed that approximately the quarters of studied groups were married. Similarly, a study conducted by Abd GoalElkalasky & Masry, (2018) in Egypt, which reported that Ninety percent of the study g and Eighty-six percent of the control group were married. Also, in agreement with the stady by Ramesh, Nayak, Pai, George, George, & Devi, (2017), which reported that the majority of patients undergoing coronary artery bypass graft

surgery were married. From investigatur's point of view, that normal range of marriage's age is between twenty-sixty

About educational level, about two-third of the studied groups had hinic intermediate education, and the educational characteristics of these subjects were consistent with the study conducted by Abdullatif et al., (2019) in Egypt, which reported that helf of studied group could write and read. Also, in agreement with Mulugeta, Ayana, Sintayehu, Dessie, & Zewdu, (2018) study, which reported that a larger proportion of anxious surgical patients had lower education level. Contrary to this, the results of study that conducted in Nigeria by Akinsulore, et al., (2010) revealed that the level of preoperative anxiety appeared to increase with increasing level of education. This may due to cultural or social differences in learning from one community to another

Regarding occupation, the present study showed that shout half of died group were working. This result is consistent with the study conducted by Abd E GwadElkalashy & Masry, (2018) in Egypt, which reported that about half of stady and control groups were working. Also, with the study conducted by Ramesh et al., (2017) an Pre-operative anxiety in patients undergoing surgery, which reported that More than half of patients undergoing coronary artery bypass graft were workers The study results showed that most

of studied patients hadn't any medical history. This is the line with the study conducted by Raslan, Salem, M. Alsitlaal, Mahmoud, & Almanzlawi, (2021) in Egypt on Preoperative Anxiety Level and Fear of Covid 19 among Adult Patients undergoing Elective Surgery, which reported that about two-third of studied group hadn't chronic diseases. Also, in agreement with was an experimental study on effect of pranayama on anxiety and selected physiological parameters in patients undergoing radiation therapy was conducted by Bhowate, & Valsalan, (2020), which elicited that maximum samples in both the control and experimental group had no comorbidities such as hypertension diabetes and thyroid disorder. This is inconsistent with a study by Lei, et al (2020) that showed about third of patients suffered from hypertension and diabetes. From the investigator's point of view that exclusion criteria of studied patients included patients take anti-hypertensive drugs.

Concerning type of surgery, the present study showed that about quarter of studied groups admitted for performing a hernia operation. Similarly, a study by Seib, et al (2018) which report that about half of patients had hernia repair. This finding may be due to inguinal hernias more occur in males due to lifting or pushing heavy objects

irregular physical activity and aging, while umbilical hernias more occur in female to obesity and pregnancy.

Part III: Anxiety among the studied patient before and after Nadi Shodhana exercise

pranayama The results made illustrated that there wasn't significant difference between study group and control group related to anxiety levels before practicing Nadi Shodhana pranayama exercise. This is in the line with a study conducted by Bhowate, & Valsalan, (2020), which reported that in pre-intervention, very few samples of experimental group had mild and severe anxiety, maximum with moderate. In pre-intervention, very few samples of control group had mild, a few had severe anxiety and maximum with moderate.

The study revealed a significant reduction in anxiety levels among study group after practicing Nadi Shodhana pranayama exercise. This result is roughly consistent with the study conducted by Chandrababu, Kurup, Ravishankar, & Ramesh, (2019) on effect of pranayama on anxiety and pain among patients undergoing cardiac surgery, which reported that there was a more significant decrease in anxiety among patients in the experimental group. Hence, the pranayama intervention significantly benefits the patients on undergoing cardiac surgery. This may be due to breathing exercises can help to relax, because they make our bodies feel like they do when we are already relaxed. Deep breathing is one of the best ways to lower stress in the body. This is because when we

breathe deeply, it sends a message to our brain to calm down and relax. The brain then sends this message to our body

Conclusion

This study indicates that Nadi Shodhana pranayama exercise is a simple non-pharmacological and cost-effective method. From the findings of the present study, there was a significant reduction in level of anxiety and regulation of blood pressure among the study group patients after practicing of Nadi Shodhana pranayama exercise as compared to control group patients who received only routine hospital care. So, it is concluded that Nadi Shodhana pranayama exercise has a positive effect on decrease level of anxiety and regulate blood pressure among preoperative patients

Recommendations

In the light of the results and conclusion drawn from the present study, the Following recommendations are proposed:

For patients:

Health care instructions for patients undergoing surgical operations to teach them importance of Nadi Shodhana pranayama exercise, and how to practice it. Providing patients undergoing surgical operations with illustrated, colored and simplified booklet about importance of practicing of Nadi Shodhana pranayama exercise.

Further research: -

The same study could be replicated on a large sample size of patients in a different clinical setting, and with a different diagnosis.

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