



**A STUDY TO ASSESS THE EFFECTIVENESS OF BUTEYKO BREATHING
TECHNIQUE ON ANXIETY AND DEPRESSION AMONG COPD PATIENTS
ADMITTED IN NARAYAN MEDICAL COLLEGE AND HOSPITAL (NMCH),
JAMUHAR, BIHAR.**

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ABSTRACT

Background And Purpose Of The Study: Chronic Obstructive Pulmonary Disease (COPD) is a progressive respiratory disorder characterized by airflow limitation and persistent breathlessness. In addition to physical symptoms, COPD patients commonly experience psychological problems such as anxiety and depression, which adversely affect their quality of life and treatment outcomes. Nonpharmacological interventions like breathing exercises are increasingly being explored to manage these psychological symptoms. The Buteyko Breathing Technique, a controlled breathing method, is believed to reduce hyperventilation, improve oxygen-carbon dioxide balance, and promote relaxation.

Objectives: 1) To assess the pre-test and post-test level of anxiety & depression among COPD patients.

2) To compare the pre-test and post-test level of anxiety & depression scores among patients with COPD

3) To determine the correlation between anxiety and depression scores among COPD patients.

4) To find the association between anxiety and depression levels with selected demographic variables

Design: Quasi-experimental Research design was selected for this study. Subjects: The participants were 30 COPD patients admitted in NMCH, Bihar. Sampling method: A Non-probability Purposive sampling technique was used to select the sample of the study. Data collection Tool: Structured interview, Anxiety Assessment Scale and Depression Assessment Scale tool was used to collect the data from the sample.

Data Analysis: The obtained data were analyzed by descriptive and inferential statistics and Interpret in the term of objective and hypothesis of the study. The mean post-test scores of anxiety and depression showed a significant reduction compared to pre-test scores ($p < 0.05$), indicating improvement in psychological status. Statistical analysis using paired t-test confirmed the effectiveness of the intervention.



Conclusion: The study concludes that regular practice of Buteyko Breathing Technique is an effective, Simple, and cost-effective non-pharmacological intervention to reduce anxiety and Depression among COPD patients.

KEYWORDS: COPD, Anxiety, Depression, Buteyko Breathing Technique, Non-pharmacological Therapy, Nursing intervention.

INTRODUCTION

Chronic Obstructive Pulmonary Disease is a progressive respiratory disorder characterized by persistent airflow limitation and chronic inflammation of the airways. The airflow obstruction in COPD is not fully reversible and generally worsens over time.² COPD primarily includes chronic bronchitis and Emphysema, which cause narrowing of airways, destruction of alveolar walls, and reduced lung elasticity.² As a result, the patient experiences chronic cough, Sputum production, wheezing, shortness of breath, and decreased exercise Tolerance.² Chronic Obstructive Pulmonary Disease is a progressive respiratory disorder characterized by persistent airflow limitation and chronic inflammation of the airways.^{2,3}

Anxiety and depression are common psychiatric comorbidities among COPD patients. Anxiety refers to an unpleasant emotional state characterized by worry, nervousness, fear, and apprehension. Depression is a mood disorder characterized by persistent sadness, loss of interest, hopelessness, fatigue, and Impaired concentration. These psychological conditions are highly prevalent in COPD patients because COPD is a chronic, progressive, and life-limiting illness. A The patient's continuous struggle with breathlessness, dependence on Medications and oxygen therapy, frequent hospital admissions, and reduced social interactions contribute to emotional distress.⁴

Breathing techniques are widely used in COPD management. Breathing retraining helps improve ventilation, reduce respiratory muscle fatigue, and enhance oxygenation. The Buteyko Breathing Technique is a structured breathing retraining method developed by Dr. Konstantin Pavlovich Buteyko, a Ukrainian physician, in the 1950s. According to Buteyko theory, carbon dioxide is essential for oxygen release from haemoglobin to body tissues (Bohr effect). When carbon dioxide levels are reduced due to hyperventilation, oxygen delivery to tissues becomes impaired, resulting in symptoms such as breathlessness, fatigue, and chest tightness. The Buteyko method aims to normalize breathing patterns by reducing breathing volume, increasing carbon dioxide levels, and promoting nasal breathing.^{6 7}

The Buteyko breathing technique involves exercises such as slow, controlled Breathing, breath-holding (control pause), and relaxation. The technique Encourages breathing through the nose rather than the mouth, as nasal breathing Filters, warms, and humidifies air. Nasal breathing also increases nitric oxide Production, which has bronchodilator effects and improves oxygen



uptake. Buteyko breathing aims to reduce excessive breathing and improve tolerance to Carbon dioxide. The patient is trained to breathe gently, quietly, and slowly to Reduce respiratory rate and volume. This results in improved breathing efficiency And reduced symptoms of dyspnoea.

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PROBLEM STATEMENT

A study to assess the effect of Buteyko Breathing Technique on anxiety and Depression among COPD patients admitted to Narayan Medical College and Hospital (NMCH), Jamuhar.”

OBJECTIVES OF THE STUDY

- To assess the pre-test and post-test level of anxiety & depression among COPD patients.
- To compare the pre-test and post-test level of anxiety & depression scores among patients with COPD
- To determine the correlation between anxiety and depression scores among COPD patients.
- To find the association between anxiety and depression levels with Selected demographic variables.

OPERATIONAL DEFINITION

Effectiveness: In this study it refers to the reduction in anxiety and depression scores after administration of Buteyko Breathing Technique among COPD patients.

Buteyko Breathing Technique: In this study it refers to a breathing retraining method involving nasal breathing, reduced breathing, breath-holding exercises (control pause), and relaxation to normalize breathing patterns.

Anxiety: In this study it refers a psychological state of fear, worry, and nervousness measured using the GAD-7 (Generalized Anxiety Disorder-7) scale among COPD patients.

Depression: In this study it refers to as a disorder which is characterized by sadness, hopelessness, low energy, and reduced interest measured using the PHQ-9 (Patient Health Questionnaire-9) scale among COPD patients.

COPD Patients: Individuals diagnosed with chronic obstructive pulmonary Disease and admitted to Narayan Medical College and Hospital (NMCH), Jamuhar for treatment.

ASSUMPTIONS

The study assumes that:

- COPD patients experience anxiety and depression due to chronic breathlessness and hospitalization.



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- Buteyko Breathing Technique can improve breathing control and reduce respiratory discomfort.
- Controlled breathing exercises promote relaxation and help in reducing anxiety.

HYPOTHESIS

(H¹): There is a significant reduction in anxiety level among COPD patients after Buteyko Breathing Technique.

(H²): There is a significant reduction in depression level among COPD patients after Buteyko Breathing Technique.

(H³): There is a significant correlation between anxiety and depression scores among COPD patients.

(H⁴): There is a significant association between post-test level of anxiety and depression among COPD patients with selected demographic variables.

DELIMITATIONS

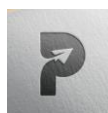
- The study is limited to COPD patients admitted to selected hospitals only.
- The sample size is limited; therefore, the findings cannot be generalized to all COPD patients.
- The duration of the study is short; hence, long-term effects of Buteyko Breathing Technique cannot be assessed.
- Anxiety and depression levels are subjective in nature and may vary from individual to individual.
- Other ongoing treatments, environmental factors, and support systems may influence psychological outcomes.

CONCEPTUAL FRAMEWORK

The conceptual framework of this study is based on the Modified General System Theory proposed by Ludwig von Bertalanffy. General System Theory explains that an individual is an open system that continuously interacts with the Environment, which is found suitable for evaluating the effectiveness of Buteyko breathing technique on anxiety and depression among COPD Patients.

Research Approach: A Qualitative research approach was used.

Research design: Quasi-experimental research design was used.



The Schematic Presentation Of Research Design

Group	Pre-Test	Intervention	Post – Test
COPD Patients	O1	X	O2

KEYWORDS:

O1 = Pre-test assessment of anxiety and depression.

X = Administration of Buteyko Breathing Technique.

O2 = Post-test assessment of anxiety and depression.

Variables :

Dependent variables : In this study, it refers to Anxiety and Depression.

Independent Variables: In this study, it refers to Buteyko Breathing Technique

Socio Demographic Variables: In this study demographic variables are Age, Gender, Educational status, Occupation, Marital status, Duration of COPD, Smoking history, Alcohol consumption , History of hospitalization , Co-morbid illness ,Type of treatment received Oxygen therapy use .

Settings of the study: The present study will be conducted at Narayan Medical College and Hospital (NMCH), Jamuhar where COPD patients are admitted for treatment.

Population: The study population consist of :

Target population: In this study target population consists of all COPD Patients admitted in NMCH.

Accessible population: In this study, the accessible populations are COPD patients admitted in Narayan Medical College and Hospital, available at the time of data collection who meet Inclusive criteria.

Sample: In the present study , sample is 30 COPD patients admitted at Narayan Medical College and Hospital, Jamuhar who fulfils the inclusion criteria.

Sampling technique: In this study, Non-Probability Purposive sampling technique was used.

Sampling Criteria:

Inclusion criteria

- Patients who are diagnosed with COPD and admitted to Narayan Medical College and Hospital (NMCH), Jamuhar.



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- Patients who are aged above 40 years.
- Patients who are willing to participate in the study.
- Patients who are available during the period of data collection.
- Patients who have mild to moderate levels of anxiety and depression.
- Patients who are able to perform breathing exercises.

Exclusion criteria

- Patients who are critically ill or admitted to the ICU.
- Patients who have severe respiratory distress requiring emergency care.
- Patients who have diagnosed psychiatric illness and are under treatment.
- Patients who have cognitive impairment or are unable to follow instructions.
- Patients who are not willing to participate in the study

Instrument Of Data Collection: The tool consists of three sections

Section A: It consist of demographic profile like age , gender, education, Occupation , Marital status, Duration of COPD , Smoking History, Alcohol History, Previous Hospitalization, Co Morbid Illness. Type of treatment, Use of Oxygen Therapy.

Section B: It Consists of Anxiety Assessment Scale. A standardized anxiety scale was used to assess the anxiety level among COPD Patients.

Example: Modified Anxiety Rating Scale / Hamilton Anxiety Scale / GAD-7

The scale may include multiple demonstrated statements with scoring

SCORING PROCEDURE

Anxiety Scale

- 0–07 → No anxiety
- 08–15 → Mild anxiety
- 16–22 → Moderate anxiety
- 23–30 → Severe anxiety

Section C: It Consists of Depression Assessment Scale. A standardized depression scale was used to assess depression level among COPD patients.

Example: Modified Depression Scale / Beck Depression Inventory / PHQ-9

SCORING PROCEDURE

Depression Scale

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- 0–07 → No depression
- 08–15 → Mild depression
- 16–22 → Moderate depression
- 23–30 → Severe depression

Content validity:

The content validity of the tool was obtained from experts in the following fields:

- Medical Surgical Nursing
- Respiratory Medicine / Pulmonology
- Psychiatry / Mental Health Nursing
- Nursing Research and Statistics

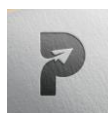
Reliability: Reliability was established using Test–Retest method or split-half method. The reliability coefficient was computed using Karl Pearson correlation formula. A tool is considered reliable if the reliability coefficient is more than 0.7.

Pilot Study : A pilot study was conducted on 5-10 COPD patients in a hospital setting. The Tool will be administered, and Buteyko breathing technique was demonstrated.

METHOD OF DATA COLLECTION

- Formal permission was obtained from the hospital authority and concerned department for conducting the study.
- COPD patients were selected based on inclusion and exclusion criteria using purposive sampling technique.
- The investigator was explaining the purpose of the study to the participants and informed consent was obtained.
- Pre-test was conducted by assessing:
 - Anxiety level using anxiety scale
 - Depression level using depression scale
- The investigator was demonstrated and guide patients to perform Buteyko Breathing technique.
- After completion of intervention, post-test was conducted using the same anxiety and depression scales.
- The collected data was organized, tabulated and analyzed using statistical methods.

Plan For Data Analysis:



The data was analyzed by using both descriptive and inferential Statistics based on the objectives and hypothesis of the study.

Ethical Consideration: Written permission from the authorities of the hospital and informed consent from the subjects were obtained before conducting the study. No ethical issues confronted while conducting the study.

RESULT:-

Table 4.1: Frequency and Percentage Distribution of Socio-Demographic Variables (N=30)

Variables	Frequency	Percentage
Age		
40-50 years	8	26.7%
51-60 years	12	40%
>60 years	10	33.3%
Gender		
Male	18	60%
Female	12	40%
Education		
No Formal Education	10	33.3%
Primary	8	26.7%
Secondary	7	23.3%
Graduate	5	16.7%
Occupation		
Homemaker	9	30%
Farmer	8	26.7%
Labour	7	23.3%
Business/other	6	20%
Marital Status		
Married	22	73.3%
Unmarried	8	26.7%
Smoking History		
Yes	20	66.7%
No	10	33.3%
Alcohol History		
Yes	12	40%



No	18	60%
Duration of COPD		
1-5 years	12	40%
6-10 years	10	33.3%
>10 years	8	26.7%
Previous Hospitalization		
Yes	17	56.7%
No	13	43.3%
Co Morbid Illness		
Present	16	53.3%
Absent	14	46.7%
Type of treatment		
Medication	18	60%
Medication+Oxygen	12	40%
Use of Oxygen Therapy		
Yes	14	46.7%
No	16	53.3%

Table 4.2: Pre-test Level of Anxiety among patient with COPD (N=30)

Level	Frequency	Percentage
Mild	6	20%
Moderate	16	53.3%
Severe	8	26.7%

Interpretation: Majority of COPD patients had moderate anxiety (53.3%)

Table 4.3: Pre-test Level of Depression among COPD patients (N=30)

Level	Frequency	Percentage
Mild	7	23.3%
Moderate	15	50%
Severe	8	26.7%

Interpretation: Majority of COPD patients had moderate depression (50%) before intervention.



Table 4.4: Post-test Level of Anxiety (N=30)

Level	Frequency	Percentage
Mild	18	60%
Moderate	10	33.3%
Severe	2	6.7%

Interpretation: After intervention, majority of patients showed mild anxiety (60%)

Table 4.5: Post-test Level of Depression (N=30)

Level	Frequency	Percentage
Mild	20	66.7%
Moderate	8	26.7%
Severe	2	6.7%

Interpretation: After intervention, majority of patients showed mild depression (66.7%), indicating Improvement.

Table 4.6: Comparison of Pre-test & Post-test Anxiety Scores

Test	Mean	SD	Mean Difference	t- value	p- value
Pre-Test	13.6	3.2	6.2	10.84	<0.001
Post-Test	7.4	2.6			

Interpretation: The mean pre-test anxiety score (13.6) was higher than the mean post-test score (7.4). The mean difference was 6.2. The calculated t-value (10.84) was statistically significant at $p < 0.001$ level.

This indicates that Buteyko Breathing Technique was effective in reducing anxiety among COPD patients.

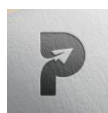
Hence the hypothesis (H^1) is accepted.

Table 4.7: Comparison of Pre-test & Post-test Depression Scores

Test	Mean	SD	Mean Difference	t- value	p-value
Pre-Test	14.2	3.8			
Post-Test	8.1	2.9	6.1	9.76	<0.001

Interpretation: The mean pre-test depression score (14.2) was higher than the mean post-test score (8.1). The mean difference was 6.1. The calculated t-value (9.76) was statistically significant At $p < 0.001$ level.

This indicates that Buteyko Breathing Technique was effective in reducing depression Among COPD patients.



Hence, the hypothesis (H^2) is accepted.

Table 4.8: Correlation between Pre-test Anxiety and Depression Scores among COPD Patients. (N=30)

Variables	Mean	SD	r - value	p- value
Anxiety Scores	13.6	3.2	0.68	<0.001
Depression Scores	14.2	3.8		

Interpretation: The above table shows a positive correlation between pre-test anxiety and depression scores among COPD patients ($r = 0.68$, $p < 0.001$). This indicates that patients with higher anxiety scores tended to have higher depression scores.

Hence, the hypothesis (H^3) is accepted.

Table 4.9: Correlation between Post-test Anxiety and Depression Scores among COPD Patients. (N=30)

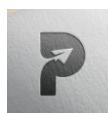
Variables	Mean	SD	r - value	p - value
Anxiety Scores	7.4	2.6	0.61	<0.001
Depression Scores	8.1	2.9		

Interpretation: The above table shows a statistically significant positive correlation between post-test anxiety and depression scores among COPD patients ($r = 0.61$, $p < 0.001$). This indicates that anxiety and depression remained positively associated after the intervention.

Hence, the hypothesis (H^3) is accepted.

Table 4.10: Association of post- test level of Anxiety with the Demographic Variables patient with COPD.

S.No.	Variable	Category	χ^2 Value	P value	Significance
1.	Age	$\leq 40/41-60/ \geq 61$	2.1	0.34	NS
2.	Gender	Male/Female	1.2	0.27	NS
3.	Marital Status	Married/ Unmarried	0.8	0.45	NS
4.	Education	Illiterate/Primary/Secondary/ Higher	2.9	0.23	NS
5.	Occupation	Employed/ Unemployed	1.5	0.30	NS
6.	Smoking Status	Smoker/ Non-smoker	4.5	0.03	Significant
7.	Duration of	<5yrs / ≥ 5 yrs	4.0	0.04	Significant



	COPD				
8.	Alcohol Intake	Yes/No	1.1	0.29	NS
9.	Family History	Yes/No	0.7	0.50	Ns

Interpretation: The above table shows that smoking status and duration of COPD had a statistically Significant association with post-test anxiety levels among COPD patients ($p < 0.05$). Other demographic variables showed no significant association.

Hence, the hypothesis (H^4) is partially accepted as selected demographic variables showed significant association with post-test anxiety and depression levels among COPD patients.

Table 4.11: Association of post-test level of Depression with their Demographic Variables patients with COPD.

S.No.	Variable	Category	χ^2 Value	p value	Significance
1.	Age	$\leq 40/41-60/\geq 61$	1.8	0.40	NS
2.	Gender	Male/Female	0.9	0.50	NS
3.	Marital Status	Married/ Unmarried	1.2	0.35	NS
4.	Education	Illiterate/Primary/Secondary/ Higher	2.0	0.28	NS
5.	Occupation	Employed/ Unemployed	1.6	0.25	NS
6.	Smoking Status	Smoker/ Non-smoker	2.8	0.09	NS
7.	Duration of COPD	$< 5\text{yrs} / \geq 5\text{ yrs}$	4.2	0.04	Significant
8.	Alcohol Intake	Yes/No	1.0	0.31	NS
9.	Family History	Yes/No	0.6	0.52	NS

Interpretation: The above table shows that duration of COPD had a statistically significant association with post-test depression levels among COPD patients ($p < 0.05$). Other demographic variables showed no significant association.

Hence, the hypothesis (H^3) is partially accepted as selected demographic variables showed significant association with post-test anxiety and depression levels among COPD patients.

Major findings of the study:

The findings of the study were discussed are as follows :-

Findings of the Sociodemographic Variables



The Sociodemographic variables shows that majority of patients belonged to the age group of 51–60 years (40%). Most participants were male (60%) and had a history of smoking (66.7%). A considerable proportion of Patients were homemakers (30%) and married (73.3%). Regarding clinical variables, Most patients had COPD duration of 1–5 years (40%), more than half had previous Hospitalization (56.7%), and 53.3% had co-morbid illness. Majority were on medication (60%), while 46.7% required oxygen therapy.

1. Discussion of Pre-test Anxiety and Depression among patient with COPD.

The first objective was to assess the pre-test level of anxiety and depression.

Findings showed:

- Majority of COPD patients had moderate to severe anxiety
- Depression levels were also moderate to high

These findings are supported by previous research which states that COPD patients commonly experience anxiety and depression due to chronic illness burden.

2. Discussion of Post-test Anxiety and Depression among patients with COPD.

After administration of Buteyko breathing technique:

- Anxiety levels significantly reduced
- Depression levels also decreased

Most patients shifted from:

- Moderate/severe → Mild levels

This indicates that breathing control and relaxation techniques were effective.

3. Effectiveness of Buteyko Breathing Technique among patients with COPD.

The main objective was to determine effectiveness.

Comparison of pre-test and post-test showed:

- Significant reduction in mean anxiety score
- Significant reduction in mean depression score
- Statistical test (paired t-test) showed significant difference ($p < 0.05$)

This proves that Buteyko Breathing Technique is effective in reducing anxiety and depression Among COPD patients.



4. Correlation between Anxiety and Depression among COPD Patients.

The findings revealed a statistically significant positive correlation between pre-test anxiety and depression scores ($r = 0.68$, $p < 0.001$). Similarly, a significant positive Correlation was observed between post-test anxiety and depression scores ($r = 0.61$, $p < 0.001$).

These findings indicate that patients with higher anxiety levels were more likely Experience higher levels of depression. The results suggest that anxiety and depression Coexist among COPD patients and are closely related psychological problems.

The findings emphasize the need for comprehensive psychological assessment and management of both anxiety and depression among COPD patients.

Hence, the hypothesis (H_3) was accepted.

5. Association with Demographic Variables among patients with COPD

Association analysis showed:

Most demographic variables (age, gender, duration of illness) had no significant Association

However, variables like:

Smoking history

Severity of COPD

May influence anxiety and depression

IMPLICATIONS OF THE STUDY

Nursing Education

- Include Buteyko breathing in curriculum
- Teach non-pharmacological interventions
- Promote holistic care approach

Nursing Practice

- Nurses can teach breathing exercises
- Can reduce anxiety without medication
- Improve patient comfort and recovery

Nursing Administration



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- Develop hospital protocols
- Conduct training programs
- Promote cost-effective care

Nursing Research

- Scope for further studies
- Compare with other breathing techniques
- Study long-term effects

LIMITATIONS

- Small sample size (N = 30)
- Conducted in single hospital (NMCH)
- Short duration of intervention
- No long-term follow-up
- Other factors (medication, environment) not fully controlled

RECOMMENDATIONS FOR FUTURE STUDY

- Use larger sample size
- Conduct multi-centre studies
- Include control group design
- Long-term follow-up studies
- Compare different breathing techniques
- Buteyko Breathing Technique should be included in routine COPD management
- Training programs should be conducted for nurses
- Awareness programs for patients and families.

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