



Study to Evaluate the Impact of Planned Breathing Exercises (Pbe) on the Relief of Symptoms of Copd

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ABSTRACT

Introduction : Health is a common theme in most cultures. Preventive and promotive aspects of health are given more importance than the curative aspects. Breathing is one the most vital functions of the body. Respiratory muscle training, which improves muscle strength and endurance, resulting in improved activity tolerance. This training prevents respiratory failure in patients with chronic obstructive pulmonary disease. **Objectives :** To identify the symptoms of selected patients with COPD in Group I and Group II before the Planned Breathing Exercise (PBE) as measured by structured interview schedule. To develop and administer PBE in experimental group patients with COPD. To evaluate the effectiveness of PBE on relief of COPD among the patients with symptoms of COPD. **Material and methods :** The research method adopted for the present study was quasi-experimental approach using a pre-test, post-test control group design. The study was conducted in the Dhiraj Hospital in Vadodara city and 40 hospitalized COPD patients were selected as sample. The sample of the study was selected using non probability convenient sampling technique. Here, the instruments used was a structured interview schedule to assess the symptoms of COPD patient. PBE was the intervention to be given to the experimental group. The data was analyzed by using descriptive and inferential statistics. Paired t-test was used for evaluate effectiveness of PBE. **Results :** the mean post test symptoms score (24.05) of group I was lower than the mean pre test symptoms score (71.5). The computed 't' value $t(19) = 15.37$ $p < 0.05$ showed that there was significant difference between the two mean symptoms scores. The calculated 't' value $t(19) = 15.37$ $p < 0.05$ is greater than the tabled value $t(19) = 2.09$ at 0.05 level). Hence null hypothesis was rejected and the research hypothesis was accepted. **Conclusion :** Hence, the Planned Breathing Exercise was effective in relieving the symptoms of COPD.

KEYWORDS

INTRODUCTION

Health is a common theme in most cultures. Every nation gives importance to the health of its people and more after Alma Ata declaration (1978), Health for all by 2000 AD (HFA 2000 AD). "Prevention is better than cure" is a well-known concept. Hence preventive and promotive aspects of health are given more importance than the curative aspects. Breathing is one the most vital functions of the body. It influences the activities of each and every cell in our body. Respiratory muscle training, which improves muscle strength and endurance, resulting in improved activity tolerance. This training prevents respiratory failure in patients with chronic obstructive pulmonary disease. In the present day, due to industrialization, air pollution is a real threat to human life, and is one of the major causes for respiratory diseases. According to World Health Report, the major cause of death in the world is respiratory diseases, COPD is one among these, and is the fifth leading cause of disability. Cigarette smoke is an aerosol containing over 4,000 different chemical substances, several of which have been linked to the development of diseases in humans. Carbon monoxide is a poisonous gas found in cigarette smoke and also in automobile exhaust that readily combines with hemoglobin, a vitally important substance in the blood that transports oxygen to the body tissues. Therefore, carbon monoxide in the blood stream prevents oxygen from reaching the tissues. Continual exposure to the high levels of carbon monoxide associated with cigarette smoking results in prolonged periods of deprivation of oxygen leading to chronic diseases. Non-smokers are also not free from the effects of smoking. Present day passive smoking is one of the major causes of respiratory tract diseases in non-smokers. In severe COPD the breathing capacity during exercise improves. Deep breathing exercise will facilitate transportation of oxygen and expel carbon dioxide from the lungs. It is a fact that pulmonary function will improve through regular breathing exercise. Lung exercises enhance clearance and expectoration of the sputum. It improves ventilator efficiency and carbon dioxide removal. Breathing exercises will promote concentra-

tion during meditation. Breathing exercise increases the blood circulation in the body and purifies lungs, heart and stomach curing the disease and heartbeat gets normalized. Breathing exercise is also used when thoracic expansion is decreased as a result of retained secretion, pain or when patient is immobilized after surgery. Lung exercises enhance clearance and expectoration of the sputum. It improves ventilator efficiency and carbon dioxide removal. Breathing exercises will promote concentration during meditation. Breathing exercise increases the blood circulation in the body and purifies lungs, heart and stomach curing the disease and heartbeat gets normalised.

NEED FOR STUDY

When someone acquires chronic condition, expectations, life's meaning and purpose are all threatened. The prevalence of chronic disease is showing an upward trend in most of the countries and about one third of the population is affected with chronic illness. Two thirds of all people over 45 years of age have chronic health problem. COPD refers to a number of disorders that affect movement of air in and out of the lungs. It is more frequent in clients living in urban environment and among socio-economically disadvantaged. Mortality and morbidity rates of COPD are increasing due to the effect of chronic irritation and pollution. Patients with COPD often depend on others for functional activities. During hospitalization pharmacological management is more emphasized which relieves symptoms for a short period of time, but recurrence occurs frequently. The selected breathing exercises include deep breathing and coughing exercise - (a) pursed lip breathing (b) localized basal expansion, diaphragm breathing and chest mobilization. These exercises could be performed without the help of any complex device and it does not need any particular preparation on the part of the performer. The selected exercises are simple and economical in the sense that they do not need any expensive devices. The exercises are practical in terms of practice and administration. Studies have shown that these selected exercises help in improving pulmonary health and a feeling of wellbeing of the performer.

HYPOTHESIS

- H₁: There will be significant reduction in Symptoms experienced by the COPD patients who are on PBE than those who are not on PBE.
- H₀: There is no significant reduction in symptoms experienced by the COPD patients who are on PBE than those who are not on PBE.

ASSUMPTION

It is assumed that,

1. COPD patients are at risk of developing complications.
2. Teaching reduces the symptoms.
3. The COPD patients will willingly participate in exercises and practice the exercise throughout their life.

INCLUSION CRITERIA

In this study, the inclusion criteria were:

1. Patients who were admitted to the Dhiraj hospital during the period of study.
2. Patient who have diagnosed as COPD.

EXCLUSION CRITERIA

1. Patients who have done breathing exercise previously.
2. COPD Patient who are serious or mentally ill

**MATERIAL AND METHOD:
RESEARCH APPROACH:**

The research method adopted for the present study was quasi-experimental approach as the study aimed at provision of an intervention i.e. PBE(Planned breathing exercise) to the COPD patients of Dhiraj Hospital Vadodara and determining its effectiveness statistically. This approach would help the investigator to evaluate the effect of the specific intervention that is 'Planned breathing exercise'.

RESEARCH DESIGN:

The research design adopted for the study was pre-test, post-test control group design. Here, the researcher administered a pre test in experimental and control group. Then, the intervention i.e. PBE (Planned Breathing Exercise) was provided only to the experimental group and after that a post test was administered to both of the groups.

SETTING:

The study was conducted in the Dhiraj Hospital in Vadodara city. This hospital is well known for its treatment and nursing care.

**VARIABLES UNDER STUDY
INDEPENDENT VARIABLE**

The independent variable in this study is Planned Breathing Exercises.

It includes,

- ❖ **Deep breathing and huffing exercise.**
- Pursed lip breathing (PLB)
- Localised basal expansion
- Diaphragmatic breathing
- Chest mobilisation

DEPENDENT VARIABLE

In this study reduction of symptoms are the dependent variables.

EXTRANEIOUS VARIABLES

The extraneous variables are age, sex, occupation, family income, history of tobacco smoking, number of previous hospitalisation, and duration of illness.

POPULATION:

In this study population consists of all the hospitalized COPD patients admitted in Dhiraj Hospital, Piparia, Vadodara during the period of data collection.

SAMPLE:

The sample for the present study was hospitalized COPD patients admitted in Dhiraj Hospital, Piparia, Vadodara.

SAMPLE SIZE:

In the study the sample size constituted of 40 hospitalized patients of Dhiraj Hospital Vadodara

SAMPLING TECHNIQUE:

The sample of the study was selected using non probability convenient sampling technique.

DATA COLLECTION INSTRUMENT

In this study the instruments used was a structured interview schedule to assess the symptoms of COPD patient.

DEVELOPMENT OF THE TOOL

The tools were prepared on the basis of the objectives of the study. The following steps were adopted prior to the development of the tool.

1. Review of literature (textbooks, journals, periodicals, Internet and unpublished dissertations) pertaining to, breathing exercises, reliability of the tool, etc.
2. Discussion with the subject experts, physicians and nursing personnel.
3. Interaction with COPD patients in the hospital during clinical posting.

This provided the researcher relevant information necessary to construct interview schedule for assessing the symptoms. Blueprint was prepared prior to the construction of the instrument, and items were developed based on the blueprint.

DESCRIPTION OF THE FINAL TOOL

The final tools used in this study were:

Tool I – Baseline Performa

COPD patient's profile consisted of 12 items such as age, sex, religion, educational status, occupation, family income, place of residence, type of house, duration of illness, number of hospitalizations for respiratory problem, history of tobacco smoking, measures taken to relieve the symptoms.

Tool II – Structured interview schedule on assessment of symptoms of COPD patients

This tool consisted of 14 sets of items of symptoms. The items were developed as to cover five different areas of symptoms. The different areas are:

- Frequency and intensity of the respiratory problem.
- Description about the problem.
- Effects of symptoms.
- Activities causing respiratory symptoms.
- Activities affected due to the respiratory symptoms.

The total possible score was 72 and the minimum score was 8. The scores were arbitrarily categorized as follows:

Severity of symptom	Overall Score	Mean % Score
Mild	8-28	0-39 %
Moderate	29-59	40-69 %
Severe	51-72	70-100 %

DEVELOPMENT OF PLANNED BREATHING EXERCISE (PBE)

The individual planned breathing exercises (PBE) were developed for COPD patients. It was prepared based on review of literature.

The steps involved in the development of PBE are:

1. Review of literature and discussion with the experts.
2. Preparation of blueprint.
3. Preparation of first draft of PBE.
4. Development of criteria checklist and content validity of PBE.
5. Pre testing of PBE.

6. Preparation of final draft of PBE.

PREPARATION OF FIRST DRAFT OF PBE

The PBE was developed according to the objectives prepared. The investigator prepared the overall plan of PBE and A. V. aids such as flash cards and demonstration of exercises. The individual Planned Breathing Exercise covered the following content area:

- Anatomy and physiology of respiratory system.
- Definition of COPD.
- Causes of COPD.
- Signs and symptoms of COPD.
- Management of COPD.
- Types of breathing exercises.
- Goals of breathing exercises.
- Procedure and demonstration of each breathing exercise.

PLAN FOR DATA ANALYSIS

Data analysis is the systematic organization and synthesis of the research data and testing of research hypothesis using the data. For the present study, the data obtained were analyzed in respect to the objectives of the study by using descriptive and inferential statistics. The plan of data analysis was worked out with the experts in the field of statistics and nursing. Frequency and percentage for the analysis of demographic data, Mean standard deviation of pretest and post test scores, Paired ‘t’ test for testing effectiveness of planned teaching programmed and research hypothesis, Chi square test would be applied to determine the significance of the difference between mean score of pretest and posttest subjects.

RESULTS:

The Data Was Analyzed And Presented Under The Following Sections:

- **Section I** Description of demographic characteristics of sample
- **Section II** Assessment of Symptoms of Patients with COPD
- **Section III** Effectiveness of Planned Breathing Exercises (PBE) on Patients with COPD

SECTION I

Description of demographic characteristics of sample

Table 1:-Frequency and Percentage Distribution of Subject according to Age, Sex, Religion, Educational Status, Occupation and Family Income.

N=20+20

Variable	Group I		Group II	
	Frequen- cy	Percentage	Frequen- cy	Percent- age

Age in years				
31-40				
41-50	1	5	3	15
51-60	1	5	6	30
61 and above	5	25	4	20
	13	65	7	35
Sex				
Male				
Female	14	70	11	55
	6	30	9	45
Religion				
Hindu				
Muslim	4	20	7	35
Christian	9	45	3	15
	7	35	10	50
Educational Status				
Illiterate				
Primary	4	20	3	15
Secondary	9	45	8	40
Pre-University	2	10	3	15
Graduate/Diplo- ma	5	25	3	15
Post Graduate	-	-	2	10
			1	5
Occupation				
Beedi Roller	2	10	5	25
Industrial Worker	3	15	4	20
Teachers	2	10	1	5
Farmer	7	35	5	25
Housewife	4	20	1	5
Any other (Spec- ify)	2	10	4	20
Family Income				
< 2000	1	5	2	10
2001-3000	7	35	9	45
30001-4000	4	20	4	20
4001-5000	7	35	3	15
>5001	1	5	2	10

Table 2:-Frequency and Percentage Distribution of the Subjects According to Place of Residence, Type of House, Duration of Illness, Number of Hospitalization for Respiratory Problem and Measures to Relieve Symptoms N = 20+20

Variable	Group I		Group II	
	Frequency	Percentage	Frequency	Percentage
Age in years				
31-40	1	5	3	15
41-50	1	5	6	30
51-60	5	25	4	20
61 and above	13	65	7	35
Sex				
Male	14	70	11	55
Female	6	30	9	45
Religion				
Hindu	4	20	7	35
Muslim	9	45	3	15
Christian	7	35	10	50
Educational Status				
Illiterate	4	20	3	15
Primary	9	45	8	40
Secondary	2	10	3	15
Pre-University	5	25	3	15
Graduate Diploma	-	-	2	10
Post Graduate	-	-	1	5
Occupation				
Beedi Roller	2	10	5	25
Industrial Worker	3	15	4	20
Teachers	2	10	1	5
Farmer	7	35	5	25
Housewife	4	20	1	5
Any other (Specify)	2	10	4	20
Family Income				
< 2000	1	5	2	10
2001-3000	7	35	9	45
30001-4000	4	20	4	20
4001-5000	7	35	3	15
>5001	1	5	2	10

SECTION II

Assessment of Symptoms of Patients with COPD

This section deals with the symptoms of 40 COPD patient in both group I and Group II

Table 3:- Distribution of sample according to the level of symptoms scores in pretest and post test in group I.
N= 20

Level of symptoms	Score	Pre test score		Post test score	
		Frequen- cy	Percent- age	Frequen- cy	Percent- age
Mild	<40	-	-	18	90
Moder- ate	40-70	1	5	2	10
Severe	>70	19	95	-	-

Table 4:-Area-wise Pre and Post Test Symptom Score of patients with COPD in Group I
N= 20

Area of sub- jective symptoms	Maximum score in each area	Mean % symptoms sub- jective score		Mean % actual reduction of symptoms	Mean % possible reduction of symptoms	Percent- age of symp- toms retaining after exercise
		Pre test	Post test			
Fre- quency of res- piratory prob- lem	25	98.2	39	59.2	61	1.8
De- scrip- tion about the prob- lem	7	97.14	55	42.14	45	2.86
Effect of symp- toms	15	99.66	22.67	76.99	77.4	0.41
Activ- ities causing symp- toms	8	100	31.25	68.75	68.75	0
Activ- ities af- fected due to symp- toms	17	100	34.7	65.3	65.3	0

Total score – 72

Table 5:-Area-wise Post Test Symptom Score of Patients with COPD in Group I and Group II
N = 20+20

Area of subjective symptoms	Maximum score in each area	Mean percentage subjective score		Difference in Mean
		Group -I	Group- II	
Frequency of respiratory problem	25	39	59.4	20.4
Description about the problem	7	55	73.57	18.57
Effect of symptoms	15	22.67	74	51.33
Activities causing symptoms	8	31.25	69.38	38.13
Activities affected due to symptoms	17	34.7	79.7	45

Total score – 72

Table 6:-Range, Mean Median and Standard Deviation of Pre and Post Test Symptoms Score of COPD Patients in both Group I and Group II
N = 20+20

Group	Test	Range	Mean	Median	Standard deviation
Group I	Pre test	66-72	71.5	72	1.75
	Post test	13-44	24.05	23	6.99
Group -II	Pre test	63-72	70.7	72	2.35
	Post test	27-63	50.8	52	8.77

SECTION III
Effectiveness of Planned Breathing Exercise (PBE) on Patients with COPD

Table 7:-Mean Standard Deviation of Difference and ‘t’ Value on Pre And Post Test Symptom Score.
N = 20+20

Group	Mean		Mean differences	SD differ- ences	‘t’ value
	Pretest	Posttest			
Group I	71.5	24.05	47.45	5.667	15.37
Group II	70.7	50.8	19.9	6.416	1.483

Data in table 15 showed that the mean post test symptoms score (24.05) of group I was lower than the mean pre test symptoms score (71.5). The computed ‘t’ value $t(19) = 15.37$ $p < 0.05$ showed that there was significant difference between the two mean symptoms scores. The calculated ‘t’ value ($t(19) = 15.37$ $p < 0.05$ is greater than the tabled value $t(19) = 2.09$ at 0.05 level). Hence null hypothesis was rejected and the re- search hypothesis was accepted.

DISCUSSION
The main aim of this study was to evaluate the effectiveness of Planned breathing Exercises (PBE) in reducing the symptoms of patients with COPD. Quasi experimental research design with experimental and control group pretest posttest design approach was adopted in order to achieve the objectives of the study. The sample was selected using non probability convenient sampling technique. The sample size was 40 and the data was collected by administering structured interview schedule on assessment of symptoms of COPD patients before and after administration of PBE. The mean post test Symptoms score ($X_2 = 24.05$) was apparently lower than their mean pre test Symptoms scores ($X_1 = 71.5$) suggesting that the PBE was effective in reducing the symptoms of COPD patients. A study examining the relationship of dyspnoea, physical activity and fatigue in patients with COPD states that breathing exercises will increase physical activity and reduce COPD symptoms.

CONCLUSION
A study was conducted to evaluate the effectiveness of PBE in reducing the symptoms of patients with COPD. The results indicates that breathing exercises were highly effective to reduce symptoms of COPD. This study indicates that symptoms of COPD will be reduce with breathing exercises.

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