A Study To Assess The Effectiveness of Balloon Blowing Exercise on Respiratory Status Among Patients With Chronic Obstructive Pulmonary Disease Admitted In Vinayaka Mission's Medical College And Hospital At Karaikal

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Abstract- *The purpose of the study was to assess the effectiveness of balloon blowing exercise among patient with COPD who were admitted in Vinayaka Mission's Hospital, Karaikal, a pre experimental design was used , total 60 samples were done for 15 days. The mean, SD, PAIRED "t" test and chi-square test were used to analyses the data. The result of the study stated that the pre intervention mean value7.38 with SD 3.46 and in post test the mean value was 14.9,SD is 2.190 the calculated t value is16.884 is the critical t value which is which is p<0.05 level. There was a significant improvement of respiratory status among patient with COPD by using Balloon blowing exercise, hence the post test value of respiratory status is more than pre test. The conclusion of the study shows that the balloon blowing exercise has positive effect on respiratory status.*

I. INTRODUCTION

For" breath is life, so if you breathe well you will live long on earth."

– Sanskrit Proverb

BACKGROUND OF THE STUDY

"When you can't breathe, nothing else matters", is the mantra of the American Lung Association. Chronic obstructive pulmonary disease, is a group of lung diseases that cause obstruction of the airways and breathing difficulties. This group includes chronic bronchitis with airflow obstruction, chronic obstructive airway disease and emphysema. These separate terms are not often used anymore and are now referred to collectively as Chronic Obstructive Pulmonary Disease. So, the exercise training and rehabilitation have been shown to reduce disability in many chronic respiratory diseases. The aim of pulmonary exercise is to break this vicious cycle and help the Chronic Obstructive pulmonary disease patients to participate in daily activities. It is known to improve quality of life and exercise tolerance in Chronic Obstructive Pulmonary Disease

Chronic obstructive pulmonary disease results from increased resistance to airflow because of airway obstruction or airway narrowing. Chronic Obstructive Pulmonary Disease (COPD) is a progressive inflammatory disease characterized by chronic obstruction in the peripheral bronchus and pulmonary emphysema. The disease is disabling with symptoms such as chronic cough, phlegm, wheezing, shortness of breath and increased infections of the respiratory passage. Changes in the lungs result in mucus hypersecretion, dysfunction of the cilia, airflow limitation and hyper inflation of the lungs, gas exchange abnormalities, pulmonary hypertension and cor- pulmonale. Persons with Chronic obstructive pulmonary disease are greatly under estimated because the disease is usually not diagnosed until it is moderately advanced. Patients usually seek medical help when they have an acute respiratory infection, with dyspnea being the main concern. Dyspnea is often progressive, and initially occurs with exertion, gradually interferes with daily activities and in late stages dyspnea may be present at rest also. The person becomes more of a chest breather, relying on the inter costal and accessory muscles rather than effective abdominal breathing.

To treat COPD, your doctor may prescribe medications or oxygen therapy. Some alternative and complementary therapies may also help relieve your

symptoms and improve your quality of life. Complementary treatments are used alongside standard COPD treatments Herbal remedies and dietary supplements, Vitamins C and E, Omega-3 fatty acids, Eucalyptus oil, Mind-body approaches, Acupuncture these are all common alternative therapies for COPD Breathing exercises may assist the patient during rest and activity by decreasing dyspnea, improving oxygenation, and slowing the respiratory rate.Regular lung exercises can help diminish the breathlessness associated with chronic obstructive pulmonary disease (COPD), but they require expensive training and patient support. A group of British physicians hypothesized that blowing up a balloon could be an inexpensive substitute for such exercises. They tested their hypothesis in a randomized trial of 28 patients with spirometrically documented severe COPD (FEV1 less than 1 liter).

Thirteen patients were told to inflate a rubber balloon 40 times a day for eight weeks, and the other 15 served as controls. At the beginning and end of the study, each subject was assessed on three outcome measures: distance walked in six minutes, overall sense of well-being, and self-assessment of breathlessness. At the end of the study, the balloon group showed a significant improvement in breathlessness and slight but non significant improvements in walking distance and well-being.The improvement in breathlessness must be taken with a grain of salt because this symptom was assessed subjectively and by the patients. But since the intervention is simple and inexpensive, it deserves further study. In the meantime, clinicians can use balloon-blowing as an aid for improving symptoms in patients for whom there are few alternatives.

even now-forty years later-there are few studies on Balloon Blowing Exercise in the literature. The Balloon blowing exercise is one of the simplest ways to control shortness of breath. It is a technique of exhaling against balloon blowing to prolong exhalation, preventing bronchiolar collapse and air trapping

II. STATEMENT OF THE PROBLEM

A study to assess the effectiveness of Balloon Blowing Exercise on respiratory status among patients with Chronic Obstructive Pulmonary disease admitted in Vinayaka Mission's Medical College and Hospital at Karaikal

III. OBJECTIVES

- To assess the pre-test level of respiratory status among patients with Chronic Obstructive Pulmonary Disease.
- To find the effectiveness of Balloon Blowing Exercise on respiratory status among patients with Chronic Obstructive Pulmonary Disease.
- To associate the pre-test level of respiratory status among patients with Chronic Obstructive Pulmonary Disease with selected Demographic and Clinical variables.

HYPOTHESIS:

- $H_{1:}$ There will be significant difference between pre-test and post-test level of respiratory statusamong patients with Chronic Obstructive Pulmonary Disease.
- H_2: There will be significant association between the pre-test level of respiratory status among patients with COPD with their selected demographic and clinical variables.

IV. METHODS AND MATERIAL

RESEARCH APPROACH:

For the present study quantitative approach has been selected.

RESEARCH DESIGN:

Quantitative approach with Pre-experimental one group pre-test and post-test research design was selected to assess the effectiveness of balloon blowing exercise on respiratory status among patients with COPD in VMMC hospital.

SETTING OF THE STUDY:

The study was conducted in VMMC and Hospital which is 750 beded hospital situated in the Keezhakasakudimedu and away from Karaikalbustand.

POPULATION:

The population for this study was COPD patients

SAMPLING:

Sample

Sample of the present study were COPD patients admitted in VMMC and hospital.

Sample Size

The sample size comprised of sixty COPD patients treating in VMMC and Hospital.

Sample Technique

Non-probability purposive sampling technique was used to select the sample for the present study.

SELECTION CRITERIA:

The sample criteria to be selected bases on the following criteria

INCLUSION CRITERIA:

- Patients of both genders
- Patients diagnosed with COPD
- Patients belongs to age group between 45 to 70 years
- Able to follow the balloon blowing exercise
- Without medical complication

EXCLUSION CRITERIA:

- Patient were not able to perform exercise.
- Patient who are reported about exacerbation of any symptom due to exercise.
- Absence during the periods of data collection.
- With medical complication such as paralysis etc.

DEVELOPMENT OF THE MODULE AND TOOL:

The steps include preparation of the tool

- Review of literature
- Preparation of blue print
- Consultation with expert
- Final draft
- Edition tools

DATA COLLECTION PROCEDURE:

Data was collected after formal permission was obtained from the concerned authorities and participants after explaining the purpose of the study by the investigator. Confidentialty was ensured. Prior to data collection, the pre test would be conducted by administering demographic and clinical variable. investigator was stated by the same day, practices this exercise at morning for 16 days and post test was done on 16^{th} day.

PLAN FOR DATA ANALYSIS:

The collected data was plan to organized, based on the objectives of the study by using descriptive statistics that i.e percentage, mean, mode, standard deviation (SD) and inferential statistics such as chi-square and 't' test. The paired 't' test was used to find the effectiveness of balloon blowing exercise between pre-test and post-test. Chi- square test was used to test the association between pretest level of respiratory status with demographic variables and clinical variables. The collected data was presented in the form of tables and figures.

V. RESULT

DISCUSION OF THE DEMOGRAPHIC VARIABLE:

Regarding age the majority of the study subjectss 3.3%were belongs to 46-50 years of age, 30.0% were belongs to 40-45 years of age, 21.1 % were belongs to above 55 years and 15.0% were belongs 51-55 years.

Regarding gender most of the subjects 66.7% were male and 33.3% were female.Mostly 46.7% participant were belongs to rural area, 30.0% were belongs to urban area, 20.0% were belong to semi urban and 3.3% from semi-rural area.

Among the participant type of house, majority of the subjects 38.3% subject were lived in thatched house,26.7% subject were lived in tiled house, 23.3% subject were lived in cement house, 11.7% subject were lived in concrete house.

Based with educational status among the subjects 36.7% were illiterate, 33.3% had primary education, 21.7% were higher education and 8.3 % were graduates.

Majority of the subjects 41.7 % were agriculture, 23.3% were unemployed, 21.7% were private employee and 13.3% were government employee.

With view of family income, majority of the subjects 38.3% were earned below Rs.10,000, 33.3% were earned Rs. 10,001-15,000, 23.3% were earned Rs. 15,001-20,000 and 5.0% were earned above Rs.20,000.

Regarding religion, majority of the subjects 70% were Hindu, 21.7% were Christian, and 8.3% were Muslim.

VI. DISCUSSION OF THE CLINICAL VARIABLES FINDING BASED ON THE OBJECTIVES

Regarding days of hospitalization the majority of the subjects 55% were 6-10 days of hospitalization, 26.7% were less than 5 days of hospitalization, 16.7 % were in between 10 -20 days of hospitalization and 1.7% were above 20 day of hospitalization.

Regarding history of smoking, majority of the subjects 68.3 % were non-smokers and 31.7 % were smokers

Regarding duration of illness, majority of the subjects 56.7% were 6-10 year of illness, 35% were less than 5 years of illness, 5% were in between 10 -15 years of illness And 3.3% were more than 15 years of illness.

Regarding occupational dust, majority of the subjects 68.3% were others, 18.3 % were industrial fumes, 11.7 % were furnace worker and 1.7 % were miner.

Regarding co-morbid illness, majority of the subjects 35% were hypertension, 31.7% were others, 23.3% were DM and 10% were tuberculosis.

Among family history, majority of the subjects 55% were from parents,30% were from none of the above,8.3% were grand from parents and 6.7% were from sibling

Regarding pharmacological treatment, majority of the subjects 81.1% were taking medication, 8.3% were no treatment, 6.7% were taking meta-dose inhaler and 3.3% were taking non pharmacological treatment.

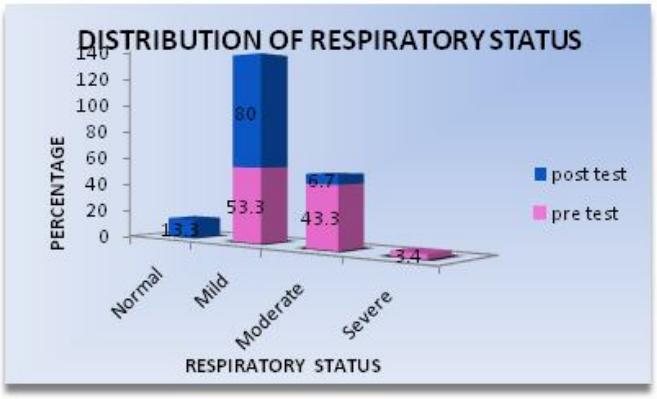
Regarding breathing difficulty, majority of the subjects 36.7% were getting breathing difficulty while walking, 23.3% were getting breathing difficulty while sleeping at night, 21.5 % were getting breathing difficulty while doing exercise and 18.3% were getting breathing difficulty while wake up.

The major findings of the study are discussed in regard to the formulated objectives as follows.

Description of the pre and post test respiratory status among patient with COPD by using Modified Respiratory Assessment scale

(N=60)

Respiratory status	Pre-test		Post-test	
	frequency	Percentage%	frequency	Percentage%
Normal	-	-	8	13.3
Mild	32	53.3	48	80
Moderate	26	43.3	4	6.7
Severe	2	3.3	-	-

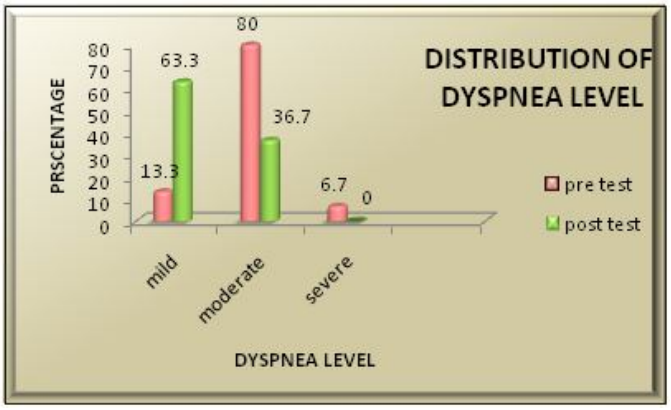


Percentage wise distribution of subjects according to Respiratory Status

Description of the pre and post test respiratory status among patient with COPD by using Modified Medical Research council dyspnea scale

(N=60)

Dyspnea level	Pre-test		Post-test	
	Frequency	Percentage%	Frequency	Percentage %
Mild	8	13.3	38	63.3
Moderate	48	80.0	22	36.7
Severe	4	6.7	-	-



Percentage wise distribution of subjects according to Dyspnea level

The above figure shows the pre test level of dyspnea level, majority of 80.0% were moderate dyspnea, 13.3 % were mild dyspnea level and 6.7% were severe dyspnea level.
In post test 63.3% of subjects respiratory status were mild dyspnea level and 36.7 % Were moderate dyspnea level.

VII. DISCUSSION

THE FIRST OBJECTIVE WAS TO ASSESS THE RESPIRATORY STATUS AMONG PATIENT WITH

CHRONIC OBSTRUCTIVE PULMONERY DISEASE DURING PRE-TEST:

The finding reveals that among the total number of 60 subjects, modified respiratory status assessment scale and modified medical research council dyspnea scale was used in this study to assess he dyspnea level among patient with COPD in RICU, Vinayaka Mission's Hospital, Karaikal. In pre-test using modified respiratory scale 53.3% subject were mild leveled dyspnea, 43.3% were moderate level of dyspnea and 3.3% had severe level of dyspnea. In post-test 13% of subject were getting normal,80% were mild level of dyspnea and 6.7% subject were moderate dyspnea level respectively.

In pre-test by using modified medical research council dyspnea scale 80% of subject were moderate dyspnea level, 13.3 % were mild dyspnea and 4% were having severe dyspnea level. In post-test 63.3%were improved to mild dyspnea level, 36.7% were moderate dyspnea level and 0% subject were severe dyspnea level respectively.

The present study findings was consistent with **Powell T.Williams et.al (2009)**was conducted a study to assess respiratory function that require little or no volitional effort on behalf of the participants being tested. Two techniques were investigated, respiratory endurance (as the inspiratory work of breathing) and tidal breathing flow profile, and these were successfully applied in 99 adult participant (68 healthy control and 31 COPD patient) and 75 children (48 clinical group and 27 healthy controls) who completed 467 respiratory endurance trials whilst seated and exercising, and 249 relaxed tidal breathing trials. Must recent emphasis has been put on developing existing devices and protocols rather than developing new techniques and approaching these from alternative viewpoints. This thesis has described the development of innovative technique to assess the function of the respiratory systems that aim to overcome the issues associated with maximal testing. It was shown that these techniques are easy to undertake for a range of participants, simple to analyze and are able to reliably differentiate between health and disease, suggesting that they could become a useful adjunct to existing methods of respiratory assessment.

TO EVALUATE THE EFFECTIVENESS OF BALLOON BLOWING EXERCISE ON LEVEL OF RESPIRATORY STATUS AMONG PATIENT WITH COPD DURING POST TEST

The obtained t' value of the respiratory status using modified respiratory assessment scale (16.884) was much higher than the 'p' valueat 0.000 level of significance.The difference in mean score shows a significant improvement of dyspnea level among patients with Chronic Obstructive Pulmonary disease and also t' value of the dyspnea level by using Modified medical research council dyspnea scale (14.287)was much higher than the table 'p' value at 0.000 level of significance.

The pre and post-test mean for respiratory status by using modified respiratory assessment scale (7.38-2.98) And standard deviation (3.460-2.190) and the mean value by using Modified medical research council dyspnea scale(2.40-1.33) and standard deviation (0.807-0.655), the difference in mean score shows a significant improvement of dyspnea level among patient Chronic Obstructive Pulmonary disease. So, the balloon blowing exercise was effective improve the breathing pattern among patient withChronic Obstructive Pulmonary disease.

The difference in mean score shows a significant improvement of dyspnea among patients with COPD. So, the balloon blowing exercise was effective which improve the breathing pattern among patent with Chronic Obstructive Pulmonary disease`

Hence the stated hypothesis H_1: there is a significant difference between the breathing pattern among patient with Chronic Obstructive Pulmonary Disease before and after Balloon Blowing Exercise was accepted.

THE THIRD OBJECTIVE IS TO FIND OUT THE ASSOCATION BETWEEN LEVEL RESPIRATORY STATUS OF THE PATIENT WITH COPD AND SELECTED DEMOGRAPIC VARIABLE AND CLINICAL VARIABLE:

There is a significant association between the level of dyspnea of the patient with COPD and selected variable such as residence (0.000) and days of hospitalization (0.000). statistical significance calculated using chi-square test.

Hence the stated Hypothesis H_2: there is a significant association between the level of dyspnea and among patient with COPD with their selected demographic and clinical variable.

VIII. CONCLUSION

According to the result of the study, patient with Chronic Obstructive Pulmonary disease who practiced Balloon Blowing Exercise 10 times per day for 14 days had improvement of the breathing pattern which is statically proved. So, Balloon Blowing Exercise was cost effective, non

invasive and highly feasible. Hence the researcher concluded the Balloon Blowing Exercise can be practice as an effective intervention on dyspnea among patient with Chronic Obstructive Pulmonary disease.

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