EFFECTIVENESS OF BALLOON BLOWING EXERCISE ONRESPIRATORY STATUS AMONG PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARYDISEASE AT A SELECTED PRIVATE HOSPITAL, COIMBATORE.

BY

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BRANCH-I MEDICAL SURGICAL NURSING
CRITICAL CARE NURSING

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CERTIFICATE

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ANNEXURES

ABSTRACT

Chronic obstructive pulmonary disease (COPD) is one of the major respiratory diseases affecting many in India. Dyspnea in patients with COPD is common which is subjective experience by the patient.A quasi experimental pretest posttest control group design was conducted to evaluate the effectiveness of balloon blowing exercise on respiratory status among 30 patients with chronic obstructive pulmonary disease by using purposive sampling technique at Kongunad hospitals, Coimbatore. Observation technique, Modified Borg's Dyspnea scale and Incentive spirometry was used to assess the respiratory rate, level of dyspnea and lung capacity respectively. Balloon blowing exercise was implemented using 90/90 hemibridge with ball and balloon position for 10-15 minutes three times a day for 5 Consecutive days.The data wereanalyzed using descriptive and inferential statistics and was highly significant at $p<0.01$.The paired t test showed highly significant (t=12.5)for respiratory rate, level of dyspnea(t=6.7)and lung capacity (t=8.2).The independent t test value showed significant difference in respiratory rate(t=5.8),level of dyspnea(t=4.2)and lung capacity(t=6.9) in posttest respiratory status.it revealed that balloon blowing exercise was effective in improving the respiratory status and quality of life .In experimental group, there was significant association found between the pretest respiratory rate and demographic variables and clinical variables in age(χ^2=29.4),gender (χ^2=29.4),body mass index (χ^2=25.2),family history of COPD(χ^2=20), history of smoking(χ^2=27.7), regular practices of exercise(χ^2=21.1).There was significant association found between the pretest level of dyspnea and demographic variables and clinical variables in gender(χ^2=24.9),family history of COPD (χ^2=11.3),history of smoking(χ^2=16.1) regular practices of exercise(χ^2=27.7) and there was significant association found between the pretest lung capacity and demographic variables and clinical variables in age(χ^2=33.1), gender(χ^2=24.9), BMI (χ^2=31.6), family history of COPD (χ^2=31.7), history of smoking (χ^2=32.2), regular practices of exercise (χ^2=24.6).Hence,Balloon blowing exercise could be effective and potentially cheap and easily practicable in order to improve the respiratory status and to improve the quality of life.

CHAPTER I

INTRODUCTION

"We live longer if we breathe better"

- Leon Chai tow

Breathing is fundamental to life. Breathing is one of the most important functions of our body. It is a slow, regular, diaphragmatic, invisible and inaudible otherwise referred as respiration. Each day we breathe about 20,000 times. A person can live only for 5 to 10 seconds without breath. A good respiratory cycle accounts for about 8-10 seconds. The respiratory center in the brainstem is responsible for controlling a person`s respiration.

Respiration is the mechanism whereby air flows between the atmosphere and the alveoli of the lungs **Marieb (2011).** Normal respiratory rate for adult is about 20 breaths per minute which is controlled by respiratory pacemaker, medulla oblongata.

According to **Guz (1997)** the control of respiration is automatic, involuntary and continuous, seeming effortless on inspiration and expiration. .

The respiration and pattern of the respiration, respiratory rate are notable vital sign in determining general health status. Currently, respiratory rate has been referred to as a 'neglected vital sign' which is often overlooked, despite its potential utility in the early recognition of changes in disease state (**Cretikos et al 2008).**

Normal respiration is affected as a result of short term infections and long term respiratory diseases. As respiratory disease is a significant chronic health problem in our society, chronic respiratory disease is found to be one of the most distressful conditions, badly affecting human life. Respiratory diseases such as COPD and asthma are the major health problems in India. While, COPD ranks 5th biggest killer disease worldwide. **WHO(2001).**

Chronic obstructive pulmonary disease (COPD) is a leading respiratory disease affecting the length and quality of life around the globe.

World Health Organization (2017) defines chronic obstructive pulmonary disease as a lung disease charecterised by chronic obstruction of lung airflow that interferes with normal breathing and is not fully reversible.

Currently, 16 million people are diagnosed with COPD all over the world. More than 90% of COPD occurs in low income and middle income countries. COPD develops slowly, and usually becomes apparent after 40 or 50 years of age. Most of the time, COPD is diagnosed in middle-aged or older adults. The disease is not contagious and is not curable. **WHO-Framework Convention on Tobacco Control (2017).**

According to **Lung India Journal** (**2013) WHO** estimates, 65 million people have moderate to severe COPD in India. More than 3 million people died of COPD in 2005, which corresponds to 5% of all deaths globally. It is estimated to be the third leading cause of death worldwide by 2030. Lung India also states that India contributes to a highly significant and growing percentage of COPD mortality which is estimated to be amongst the highest in the world; i.e. more than 64.7 is estimated age death rate per 100,000 amongst both sexes. This would translate about 556,000 in case of India (>20%) which is of a world total of 2,748,000 annually.

According to **Indian Council of Medical Research ICMR (2015)** estimation, the incidence of COPD is 5% among Indian men. And it is the reason for major mortality rate in India.

Global Initiative for Lung Diseases (GOLD) defines Chronic obstructive pulmonary disease as a disease that may be prevented and treated, and is characterized by persistent respiratory symptoms and obstruction of airways due

to pathologic changes of respiratory passages and alveoli. GOLD also classifies the COPD into four stages based on the airflow limitation and exercise tolerance.

As in Chronic obstructive pulmonary disease (COPD),dyspnea is one of a cardinal symptom which is distressful .It originates from a complex of physiological mechanisms that significantly contributes to disease burden and poor quality of life . Patients with COPD progressively deteriorate, with increasing intractable dyspnea and respiratory rate.

According to **Nicholson (2015**) Shortness of breath caused by COPD can be treated and managed in several ways. Shortness of breath can make a person with COPD tend to avoid physical activities or exercise that make the feeling of breathlessness. As many as 50% of patients with COPD continue to experience significant dyspnea due to their activity limitations.

Kimberley (2016) in the article of COPD and dyspnea stated that physical activity may lead to breathlessness. However, exercise can help increase the stamina and reduces the episodes of breathlessness. A regular exercise practice of smart breathing exercise will help to regain the breath and can help improve strength of COPD patients by reducing the feeling of breathlessness.

Carolyn.L.Rochester (2003) suggested that exercise rehabilitation measures like balloon blowing relieves shortness of breath or dyspnea, reducing hospitalizations and disability from COPD, increases exercise capacity and thereby improves the quality of life. It also improves and strengthens the respiratory muscles and minimize the lung dysfunction.

Hence, patients with COPD will be benefitted with early participation in exercise programme as it may tend to alleviate dyspnea and improves the respiration .It also helps in reduction in exacerbations where persons activity is convincingly limited.

NEED FOR THE STUDY

According to **Disability Adjusted Living Years (DALY)** India contributes very significant mortality from COPD 102.3/100,000 and 6,740,000 out of world total of 27,756,000 DALYs; thus significantly affecting health related Quality of Life in the country. COPD is surpassing Malaria, Tuberculosis even today.

Lung India(2013) states Burden of Lung Disease (BOLD) investigators using BOLD protocol identified that the prevalence of Stage1 or higher COPD in participants > 40 years of age based in rural Kashmir was found to be 19.3%.Thus preliminary data emerging from the country is suggestive of higher true burden of COPD than is currently believed.

Crude estimates suggest there are 30 million COPD patients in India. India contributes a significant and growing percentage of COPD mortality which is estimated to be amongst the highest in the world.

According to **WHO [2015]** COPD rates is much higher in India. The global prevalence is 11.7% (8.4%–15.0%) in overall COPD cases and prevalence rates in people aged 40 years or more.

Dyspnea and exercise limitation is the strongest predictors of mortality in patients with COPD. According to **Rennard and colleague's [2005]** 50 percent of all COPD present with dyspnea and activity intolerance. Dyspnea is based on diverse factors, such as skeletal muscle dysfunction, postural instability, improper zone of apposition(ZOA) and affected nerve coordination. Which limits physical activities at later stages.

Inspiratory muscle weakness is major clinical relevance for dyspnea in patients with COPD. The existence of such skeletal muscle dysfunction provides the scientific rationale for undertaking exercise training in COPD patients.

Exercise, either short term or long term duration is important for improving and maintaining strength and endurance among patients with COPD.

Various pathophysiologic mechanisms can contribute to dyspnea in patients with COPD. Current understanding suggests that a "mismatch" between neural activity from the brain and consequent ventilator output from the respiratory muscles contributes to the perception of breathlessness.

Rochester (2003) suggests that despite of irreversible abnormalities of lung architecture, structure, metabolic and physiologic skeletal muscle abnormalities noted in COPD, it can be improved or reversed by some exercise training. In turn it restores the highest level of functioning capacity of lung possible for any existing degree of ventilator impairment.

Antoniu (2010), states the mechanism of breathlessness in COPD largely causes the sensation of breathing discomfort. He also suggested that use of exercise such as breathing strategies can be beneficial.

A group of muscles interacts to adapt thoracic dimensions to breathing. Basic respiratory muscles are the diaphragm, the internal intercostal and the external intercostal. Accessory muscles, or muscles that contribute to lifting the ribcage so that lungs can expand and take in air by blowing up several balloons effectively exercises these muscles, building lung capacity and stamina maintaining zone of apposition (ZOA) .one of the key aspect of restoring the ZOA is promoting exhalation. In respiratory diseases such as COPD, the ZOA is decreased and person experiences exhalation difficulty in order to improve such function, several nonpharmacologic approaches have been suggested. One such proposed intervention for COPD is 90/90 hemibridge with ball and balloon

blowing exercise that is given as an adjuvant to pharmacologic strategies to prolong exhalation and thereby improve pulmonary functions.[COPDfoundations,2000].

Kyndall Boyle., (2007) in his journal article the value of blowing up of balloon, mentions that when Zone of apposition (ZOA) is optimized, the respiratory roles and neuromuscular coordination and postural roles of the diaphragm have maximal efficiency. In suboptimal positions diaphragm has a decreased ability to draw air into the thorax as a result of less caudal movement upon contraction. This eventually leads to use of accessory muscles for breathing. Therefore, he proposed a therapeutic exercise that promotes optimal posture finely tuned with neuromuscular coordination of the deep muscles, diaphragm and pelvic floor, 90/90 bridge with ball and balloon position which alters the faulty mechanism of breathing and helps to restore ZOA in order to allow the main diaphragm to perform its respiratory roles.

Hence, the researcher adopted and was interested to conduct a study on 90/90hemibridge with ball and balloon exercise as it is intended to maintain and prolong the activity level of patients which is shown as the strongest predictor of mortality in COPD patients. It is also a non-invasive ,cost effective, easy and highly useful exercise that is beneficial in desensitizing dyspnea perception ,increases exercise tolerance on regular practice by improving neuromuscular coordination also and to optimize the zone of apposition.

STATEMENT OF THE PROBLEM

A STUDY TO EVALUATE THE EFECTIVENESS OF BALLOON BLOWING EXERCICE ON RESPIRATORY STATUS AMONG PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE AT A SELECTED PRIVATE HOSPITAL, COIMBATORE.

OBJECTIVES:

- To assess the respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease.
- To assess the effectiveness of balloon blowing exercise on respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease in experimental group.
- To associate the pretest level of respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease with their selected demographic variables.

OPERATIONAL DEFINITIONS:

Evaluate:

In this study, evaluate refers to measures to quantify the outcome of intervention administered by using observation technique ,modified borg's dyspnea scale and incentive spirometry.

Effectiveness:

In this study, effectiveness means the desired outcome of balloon blowing exercise on respiratory status among patients with Chronic obstructive pulmonary disease in terms of difference between pretest and posttest scores.

Balloon blowing exercise:

In this study, it refers to simple exercise of blowing up of balloon, for 10-15 minutes in 90/90 bridge with ball and balloon position, which helps to maintain the Zone of apposition by inhaling slowly through the nose and exhale forcefully about through purse lip with a period of pause, until the size of balloon reaches diameter of 7inches, 3 times per day for 5 consecutive days.

Respiratory status:

In this study, it refers to a clinical parameter such as respiratory rate, level of dyspnea and lung capacity which is determined by using the observation technique, modified borg's dyspnea scale and incentive spirometer and its score among patients with Chronic obstructive pulmonary disease .

Patients with Chronic obstructive pulmonary disease:

In this study, it refers to patients who are diagnosed as Chronic obstructive pulmonary disease of stage I & II as defined by Global Initiative for Lung Diseases and are admitted in a private hospital with the age group between 45-75 years.

ASSUMPTIONS

- ❖ The patients with chronic obstructive pulmonary disease may have dyspnea.
- ❖ The patients with chronic obstructive pulmonary disease may have decreased lung capacity.
- ❖ Balloon blowing exercise may have positive impact on respiratory status, thereby it may improve the quality of life.
- ❖ Balloon blowing exercise may slow down the exhalation phase of respiration which is helpful for decreasing shortness of breath.
- ❖ Balloon blowing exercise adopting in 90/90 hemibridge with ball and balloon position may improve the zone of apposition and thereby it improves the respiratory status.
- ❖ Respiratory rate, level of dyspnea and lung capacity of patients with Chronic obstructive pulmonary disease will be influenced by selected demographic variables.

HYPOTHESES

- **H_1** : There is a significant difference between mean pre test and posttest scores of respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease in experimental and control group.

- **H_2** : There is a significant difference between mean post test scores of respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease in experimental and control group.
- **H_3** : There will be a significant association between pretest score of respiratory status among patients with chronic obstructive pulmonary disease and their selected demographic variables in experimental and control group.

DELIMITATIONS

- ✓ The study is limited to sample size of 60
- ✓ Data collection procedure is limited to 5 weeks

PROJECTED OUTCOME

- ❖ Balloon blowing exercise can be practiced for all patient admitted with chronic obstructive pulmonary disease, so that the respiratory status will be improved.
- ❖ Balloon blowing exercise is one of the non-pharmacologic method to promote the respiratory status and thereby improves the quality of life
- ❖ Healthcare providers can use balloon blowing exercise as a cost effective measure to promote the respiratory status among patients with COPD.
- ❖ Balloon blowing exercise, when adhered for a prolonged period of time can promote exercise tolerance and improves the lung capacity.

CONCEPTUAL FRAME WORK

The conceptual framework is the processor of the theory. It provides a broad perspective for nursing practice, research and education. Conceptual frame work plays several interrelated roles in the progress of science. Their overall purpose is to make scientific findings meaningful and generalizable.

Polit and Hunglar (1995) state that, conceptual framework is interrelated concept on abstraction that is assembled together in some rational scheme by virtue of their relevance to common theme.it is a device that helps to stimulate research and extension of knowledge by providing both directions and impetus.

The conceptual framework for the present study was adopted from modified Widenbachs's helping art of clinical theory (1970). This theory directs action towards and explicit goal.

It consists of central purpose and steps include identifying a need for help, ministering a needing help, validating that a need for help was met.

Central purpose

Central purpose refers to what the nurse wants to accomplish.it is the overall goal towards which the nurse strives. It transcends the immediate intent of the task by specifically directing activities towards the objectives. In this present study, central purpose refers to the improvement of the respiratory status of chronic obstructive pulmonary disease.

Step-I Identifying need for help

Identifying need for help determines patient's need for help based on the existence of a need. In this study, the need for help was identified by assessing the demographic variables and pretest assessment of respiratory rate by observation technique, level of dyspnea by using modified borg's dyspnea scale and lung capacity by incentive spirometry among patients with COPD, before the administration of balloon blowing exercise.

Step –II Ministering a needed help

Ministering refers to provision of needed for help. It requires an identified need and a patient who wants help. After identifying the need for help, intervention is to be implemented. In this study, ministering a needed help was provided as follows,

Agent :

Investigator

Recipient :

Patients with chronic obstructive pulmonary disease

Goal :

To improve the respiratory status.

Mean :

90/90 hemibridge with ball and balloon blowing exercise.

Frame work :

Kongunadu hospital, Coimbatore.

Step-III Validating that a need for help was met

Validation refers to collection of evidence that shows a patient's need have been met and that their respiratory status has been improved as a result of the nursing action. In this study, evaluation is established by posttest assessment of the respiratory rate by observation technique, level of dyspnea by modified borg's dyspnea scale and lung capacity by using incentive spirometry among patients with chronic obstructive pulmonary disease Those who have not attained the effectiveness of balloon blowing exercise will be subjected to the reimplementation of the intervention which may be beneficial for the patients with chronic obstructive pulmonary disease.

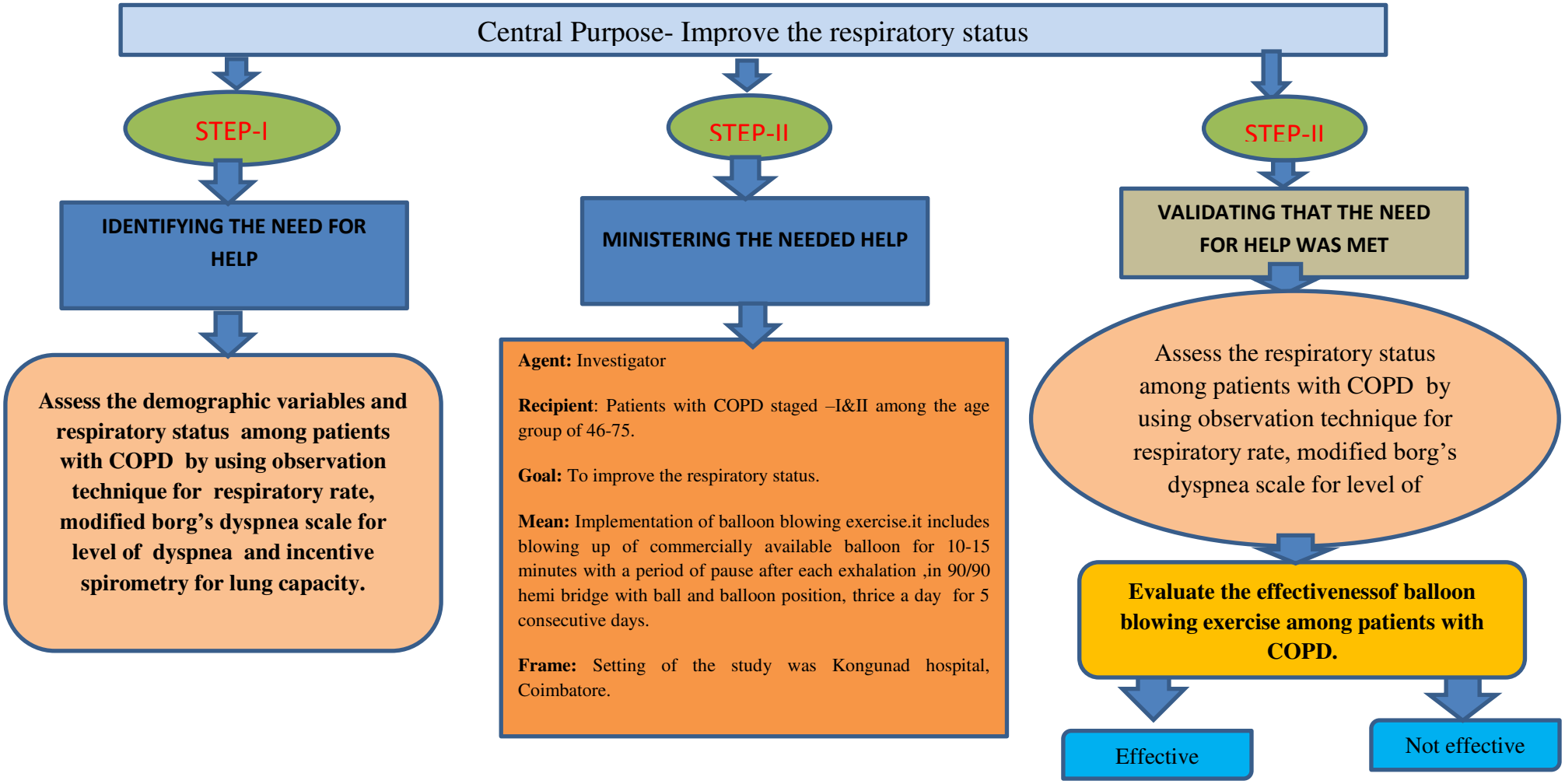

Fig. 1.1 Modifed Widenbach's Helping art of clinical Nursing Theory

CHAPTER –II

REVIEW OF LITERATURE

The review of literature is a key step in the research process. Review of literature refers to an extensive, exhaustive, and systematic examination of publications relevant to the research project. The review of literature is defined as a broad, comprehensive, in depth, systematic and critical review of scholarly publications, unpublished scholarly print material, audiovisual materials and personal communications. Literature review is an account of the previous efforts and achievements of scholars and researchers on phenomenon.

According to **Polit and Hunglar (2002),** review of literature is a critical summary of research on topic of interest generally prepared to put a research problem in context to identify gaps in prior studies to justify new investigation. This chapter has review of studies done, Methodology adopted and conclusion obtained by other investigator which helps to study the problem in depth.

The source are obtained from textbooks, journals, internet resources.

The study was reviewed with various literature to strengthen the study .The related reviews are presented under the following headings.

1. Studies related to Chronic Obstructive Pulmonary Disease(COPD).
2. Studies related to dyspnea and lung capacity in Chronic obstructive pulmonary disease.
3. Studies related to balloon blowing exercise on Chronic obstructive pulmonary disease.
4. Studies related to effectiveness of 90/90 hemi bridge with ball and balloon position on respiratory and postural roles.

1. Studies related to chronic obstructive pulmonary disease(COPD)

Katia.M.C.Verhamme et al.,(2016) in his ongoing prospective population-based cohort study embedded in Rotterdam Study investigated the

occurrence of chronic pulmonary diseases among elderly. The objective of this study is to investigate the prevalence and incidence of COPD in Netherland. In this Rotterdam Study (RS) approximately 15,000 participants aged ≥45 years were selected, The study encompasses three cohorts: RS I, RS II and RS III. In this cohort of 14,619 participants with informed consent for follow-up, a total of 1993 individuals (56.5 % males) were identified as having COPD and 12,626 participants (38.8 % males) did not have COPD. The prevalence of COPD at baseline in the Rotterdam Study was 4.7 % (689/14,619) and the prevalence at the end of follow-up was 13.6 % (1993/14,619). The overall incidence rate (IR) of COPD was 8.9/1000 person-years (PY) (95 % CI 8.4–9.4/1000 PY)

Christopher.L.Bryson (2009) conducted cohort study among 23,971 veterans with COPD, objective of the study was determine COPD risks and exacerbation. Purposive sampling technique was adopted for the study. Samples were current and past smokers. In comparison to current smokers, ex-smokers had a significantly reduced risk of COPD exacerbation after adjusting for age, comorbidity. The magnitude of the reduced risk was dependent on the duration of smoking abstinence (adjusted HR: quit <1 year, 1.04; 95% CI 0.87–1.26; 1–5 years 0.93, 95% CI 0.79–1.08; 5–10 years 0.84, 95% CI 0.70–1.00; ≥10 years 0.65, 95% CI 0.58–0.74; linear trend <0.001).

J Grigg et al., (2007) conducted an epidemiological survey on COPD patients. The aim of the study was to conduct an epidemiological survey on the diagnosis of COPD among the community. Data was collected using purposive sampling techniques. The researcher identified that only 9.5% of never smokers had been diagnosed with COPD in our study compared with 25.4% of smokers or former smokers (P=0.002). Researcher also consistently found that 86% of the non-smoking COPD patients were women and no significant passive smoking or professional exposure to pollutants were identified.

M. Leal et al.(2005) conducted a ongoing cross sectional prospective epidemiological, observational clinical study to investigate on the burden of patients with COPD. The aim of the study was to analyze the burden of the

disease using a simple, validated, self-administered questionnaire developed for clinical practice. Convenience sampling is adopted for the study. COPD was rated at four levels by the forced expiratory volume in one second (FEV1) according to the global initiative for COPD, GOLD scale. The result interprets that COPD affects old men of the patients studied, most patients were (95.4%) were diagnosed as moderate COPD stage-II. Severity of COPD was lower in women than in men (92.6% men) compared with 13.7% women. Researcher concludes that dyspnea and airflow limitation are the clinical variables that mostly affects the burden of COPD from the patients point of view.

2) Studies related to dypnea and lung capacity in chronic obstructive pulmonary disesase

Judith J Stephenson and Collegues (2017) conducted a two-part observational study consisting of a cross-sectional patient survey of adults with COPD followed by a retrospective analysis of patients on degree of dyspnea perception. purposive sampling technique was adopted for the study. The objective of the study was to assess the degree of dyspnea affecting COPD. A total of 673 patients completed the survey. Among the 673 patients, 65% reported mMRC grades 0 or 1, considered mMRC low dyspnea symptomatology and 35% reported mMRC grades 2–4, considered mMRC high dyspnea symptomatology. Compared with patients with low dyspnea symptoms, higher percentage of patients with high dyspnea symptoms reported as COPD (88.1% vs 69.8%; P<0.0001;,) diagnosed at a younger age (52.4 vs 55.2 years; P=0.001; and had a longer history of COPD (7.1 years vs 5.0 years; P=0.001; Slightly more patients in the high mMRC group had a spirometry test in the last 6 months compared with the low mMRC group (44.5% vs 39.4%; P=0.342.

Hyun –ju-jun(2016) published a study in respiratory journal on effectiveness of balloon blowing exercise on lung capacity and muscle activity on adult smokers. The objective of the study was to investigate the effects of balloon blowing exercise to enhance the pulmonary function and muscle activity of elderly smokers. Convenience sampling was used to select the participants of

adult elderly smokers for this study. The result of the study shows in the BBEG group, FVC, FEV1/FVC, PEF, and muscle activity in the rectus abdominis had increased significantly after four weeks ($p<0.05$), but reduced significantly in the following two weeks ($p<0.05$). FEV1 and VC had increased significantly after four weeks ($p<0.05$), but no significant differences were found after six weeks ($p>0.05$)

Kaveri. M .Roy (2014) conducted a one group, pre and post-test design. There was no control group. Data was collected from subjects, but each subject was assigned a number and information was kept on a password-protected computer for security. The purpose of the study was to effectively reduce dyspnea. A total of 20 samples were selected using Convenience sampling. of the total sample size (n=20), none of the participants were following a dyspnea protocol prior to the study. The pre-test mean score was 2.15 ± 1.63 where as the post-test mean score was 2.10 ± 1.80. At the initial home visit, 11 participants (55%) reported Borg score of "2" or lower. At the final follow up, 15 participants (75%) reported a Borg score of "2" or less. The project goal of having 50% of the participants report Borg scores of "2" or less at the post-test was met. Researcher suggested that Patients and caregivers appreciate having a dyspnea protocol to follow and also appreciated the follow up phone calls, as a chance to discuss their condition and ask questions.

2. Studies related to balloon blowing exercise on Chronic obstructive pulmonary disease.

Kripa.A(2017) conducted a pre experimental, single group pretest post test research study to assess the effectiveness of the effectiveness of balloon blowing exercise on level of dyspnea The objective of the study was to assess the effectiveness of balloon blowing on the level of dyspnea among COPD patients during posttest on conducting posttest after the implementation of balloon blowing exercise. 20 samples were selected using purposive sampling technique. The study was conducted in Mahatma Gandhi medical college hospital, Puducherry. Among 20,12(60%) was found to be non dyspneic,8(40%) were found to be dyspnea. There was no association between the demographic variables.

Ali Rafaqat et.al., (2016)conducted a comparative study with incentive spirometry and balloon blowing exercise in patients with chest intubation. The aim of the study was to determine the forced expiratory volume. Purposive sampling was adopted for the study. The participants were admitted with chest trauma with chest intubations. The p-value is 0.00 for FVC, FEV1, SPO, RR and Chest Expansion. The result was significant at 0.05. Implying that balloon blowing exercises were found effective. The researcher concluded the pre and post differences in incentive spirometry group and balloon blowing group found a significant improvement in breathlessness with the p-value is 0.00 for FVC, FEV1, SPO, RR and Chest Expansion.

Renuka K.**(2013)**conducted a quantitative study on effectiveness of balloon blowing exercise among lower respiratory disorders (including COPD) with an objective of evaluating the effectiveness of the therapy on lower respiratory disease patients. The sampling technique adopted for this present study is purposive sampling. Participants who met the inclusion criteria were selected for the study. The findings of the study depicts 15(75%) of patients had poor respiratory rate as well as poor dyspnea score and 5(25%) patients had poor lung capacity before the implementation of balloon therapy. Where as 18(90%) patients had normal respiratory rate . 12(60%) patients had normal dyspnea score and 20(100%) patients had achieved normal lung capacity after the implementation of balloon therapy. It was also noted that there was a highly significant improvement in the respiratory rate ($P < 0.001$), dyspnea score ($P< 0.05$) after balloon therapy. The study suggest regular practicing of exercise may improve the respiratory status.

Lai Dee et, al (1998) conducted a quantitative study on regular balloon blowing. A total sample of 20 participants with chronic bronchitis and emphysema .The aim of the study was to assess the reduction in breathlessness after the implementation of the balloon blowing therapy. Among 20, 11 women, 9 men with average age 65 were randomly assigned to the balloon blowing group .The

result of the study reported a significant reduction in breathlessness 9(83%) after regular balloon inflation(p=0.05).

3. Studies related to effectiveness of 90/90 hemibridge with ball and balloon position maintaining to improving Zone of apposition (ZOA) in respiratory role and postural roles.

Jorida fernandes and Akshay.(2017) conducted a quasi experimental study on Effects of Hemibridge with Ball and Balloon Exercise on Forced Expiratory Volume. The participants were selected using purposive sampling technique. The objective of the present study was to evaluate the effects of hemibridge with ball and balloon exercise on pain, forced expiratory volume and functional abilities in patients with chronic low back pain using Visual Analogue Scale (VAS), Forced Expiratory Volume (FEV) and Modified Oswestry Disability Questionnaire (MODQ).The Results depicts that there was a significant difference between pre-and post of pain. The p value of FEV6 and MODQ by paired t test was statistically significant with p value of 0.02 and 0.0007 respectively. The researcher concluded that there is an immediate effect of hemibridge with ball and balloon exercise on pain, FEV6 and functional ability in patients with chronic low back pain

Boyle et al., (2010) in his quantitative experimental study depicted 90-90 Hip Lift with Balloon tofind out the effectiveness of the exercise in maintating the zoneof apposition. Purposive convenience sampling was adopted in selecting athelets who have low back pain and decreased forced expiratory volume associated with it for the present study .The study was conducted in the respiratory unit under the guidance of the physiotherapists. Objective of the study was to determine the effectivenss of balloon blowing on zone of apposition .the results were found to be highly significant among the athelets in maintaining the zone of apposition .The result was significant at ($p<0.005$).

Lando et al.(2010) conducted a study on respiratory patients and zone of apposition. Purposive sampling was adopted for the study and 20 patients were selected .The objective of the study was to increase the exercise intolerance among patients undergoing lung reduction surgery ,reported that the subject's ZOA of the diaphragm was increased as a result of LVRS surgery which increased their exercise tolerance and breathing efficiency patients were 58 +/- 8 year of age, with severe COPD and hyperinflation (FEV1 = 0.68 +/- 0.23 L, FVC = 2.56 +/- 7.3 L, and TLC = 143 +/- 22% predicted). Following LVRS, PADL increased by 4% (from 13.9 +/- 1.9 cm to 14.5 +/- 1.7 cm; p = 0.02), VDML increased by 44% (from 2.08 +/- 1.5 cm to 3.00 +/- 1.6 cm, p = 0.01), and diaphragm dome height increased by more than 10%.. This is one study that supports the value and benefit of obtaining optimal ZOA for breathing, which in this case was achieved via surgery by improving respiratory mechanics in patients with severe chronic obstructive pulmonary disease (COPD) and increase its area of apposition with the chest wall, and thereby improve its mechanical function.

CHAPTER-III

RESEARCH METHODOLOGY

Research methodology is the over all plan for addressing the research problem. It covers multiple aspects of the study's structure. It acts as a guide for planning, implementation and analysis of the study.It includes the description of the research approach, research design ,dependent and independent variables, sampling design, sampling criteria, description of the tool, pilot study and a planned format for data collection and a plan for analysis. The research methodology involves systematic procedure which the researcher starts from initial identification of the problem to its final conclusion.

According to **Polit and Beck [2014],** Methodology refers to ways of obtaining, organizing and analyzing data. Methodology decisions depend on the nature of the research question.

This chapter deals with the description of the different steps undertaken by the investigator in the study. It includes the research approach, design, settings, variables, population, sample size, sample technique, sampling criteria, description of tool, content validity, reliability, pilot study, ethical consideration, data collection procedures and plan for data analysis.

RESEARCH APPROACH

According to **Polit and Beck[2014],** Research approaches are plans and procedures for research that span the steps from broad assumptions to detailed methods of data collection, analysis, and interpretation.

The research approach adopted for the present study was Quantitative evaluative research approach.

RESEARCH DESIGN

Polit and Beck (2010), Research design as the overall plan for addressing a research question including specification for enhancing the study's integrity.

The design selected for the present study was quasi experimental, non-equivalent pretest posttest with control group design

E	O1	X	O2
C	O1	-	O2

Key:

E- Experimental group

C- Control group

O1- Pretest assessment of respiratory rate, level of dyspnea and lung capacity among Patients with COPD in experimental and control group.

X- Implementing balloon blowing exercise, with commercially available balloons in 90/90 hemibridge with ball and balloon position for 3 times a day, for 10-15 minutes for 5 consecutive days

O2- Posttest assessment of respiratory rate, level of dyspnea and lung capacity among Patients with COPD in experimental and control group

RESEARCH VARIABLES

According to **Suresh K Sharma[2013],** research variables are the qualities, properties, or characteristics which are observed or measured in natural setting without manipulating and establishing cause and effect relationship.

Independent variables: balloon blowing exercise.

Dependent variables: respiratory rate, level of dyspnea, lung capacity.

STUDY SETTING

Polit and Hunglar(1999) states that setting is the physical location and conduction of study in which data collection takes place.

This present Study was conducted in Kongunad hospitals Pvt Ltd, Coimbatore, which is situated in the heart of the City nearby Kongunadu College of nursing. It is a 300 bedded hospital with 24hours emergency service and diagnostic facilities. The hospital comprises of 7 floors with all facilities, outpatient department, emergency department, in patient department, cardiac care unit, one minor OT, and 2 major OT, and two postoperative wards. There are atleast 20 beds in each wards. The approximate number of in patients of COPD is about 4-5 per day and average length of stay is 5-6days.

POPULATION

According to **Polit and Hunglar (1999**) population is defined as the entire aggregation of cases that meet a designed set of criteria.

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Target population

According to P**olit and Beck[2010**], target population is the entire population in which a researcher is interested and to which he or she would like to generalize the study results

The target population for this present study was patients with COPD.

Accessible population

According to **Polit and Beck [2010],** accessible population is the population of people available for a particular study often, a non-random subset of target population

The accessible population of the present study was patients were admitted in Kongunad hospitals.

SAMPLE AND SAMPLING

Sample

According to **Polit and Hunglar (1999)** samples is the subset of population selected to participate in the research study.

The sample was patients who are admitted in the wards for a minimum of 5 days with the diagnosis of COPD, staged-I &II, and who fulfills the inclusion criteria, in Kongunad hospital at Coimbatore.

Sample size

According to **Suresh K Sharma [2013]**, sample size is the number of subjects, events, behaviors, or situations that are examined in a study.

The sample size for this study was 60, which includes 30 samples for experimental group and 30 samples for control group.

Sampling technique:

Polit and Hunglar (1999) defined sampling technique is the process of selecting a portion of the population to represent the entire population.

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

SAMPLING CRITERIA

According to **Suresh K Sharma [2013],** sampling criteria is the list of the characteristics essential for inclusion or exclusion in the target population.

Inclusion criteria:

Patients with COPD who were

- Between the age of 45-75 years.
- Admitted in wards for a minimum of 5 days
- Diagnosed with stage I and stage II COPD as defined by GOLD.
- With dyspnea score $\underline{< 4}$
- Who knows to read and write Tamil, English

Exclusion criteria:

Patients with COPD who were

- Critically ill and diagnosed as COPD exacerbation.
- Unable to follow the instruction .e.g., deaf and dumb, psychiatric patients and blind patients
- Cardiac co-morbid illness.
- Not willing to participate
- Underwent lung surgery.
- Who have oral lesions

METHOD OF DATACOLLECTION

(i) Tool

According to **Carol.L.Macnee.,[2004]**the study methods used to collect data are intended to allow the researcher to construct a description and meaning of the variable under study.

- A structured questionnaire on demographic variables.
- Modified Borg`s dyspnea scale was used to measure the level of dyspnea .
- Incentive spirometer was used to measure Lung capacity.

(ii) Description of the tool

Section A- Demographic proforma

This part consists of selected socio-demographic variables which includes 10 items such as age, gender, educational status, occupation status,BMI, family history of COPD, smoking habit, area of work, regular practice of exercise.

Section B- Modified borg's dyspnea scale.

The MBS is a valid and reliable assessment tool for dyspnea. The principle of self-rating is used to describe the degree of dyspnea by the patient himself which is an important link in quantifying the complex feeling of being short of

breath or having dyspnea .It consists of 11 items with an option including nothing at all level of dyspnea to maximal level of dyspnea of total score 0-10.

Table 3.1 score interpretation on dyspnea

DYSPNEA	SCORE
Nothing at all	0
Very Very Slight dyspnea	0.5
Very Slight dyspnea	1
Slight dyspnea	2
Moderate	4
Somewhat severe	5
Severe	6,7
Very severe	8,9
Very very severe	9
Maximal	10

Section-C Incentive spirometry.

3 balls incentive spirometry was used to measure the lung capacity. It comprises of 3 different colour balls in which the rise of each ball interprets the inspiratory capacity Rise of one ball shows 600cc/minute, rise of 2 balls shows 900cc/minute, rise of 3 balls shows 1200cc/minute.

No.of balls	Capacity/minute.
1 ball	600cc
2 ball	900cc
3 ball	1200cc

ETHICAL CONSIDERATION

The present study was approved by the ethical committee; permission was obtained priorly from the Managing trustee Kongundu hospitals Pvt Ltd at Coimbatore. Verbal consent was obtained from the samples to conduct the study and assurance was given for confidentiality of their data.

CONTENT VALIDITY

According to **Polit and Beck[2010**] validity is a criterion referring to the degree to which inferences made in the study are accurate and well founded in measurement, the degree to which an instrument measures what it is intended to measure.

Validity of the tool was obtained from four experts in the field of Medical Surgical Nursing and one expert from pulmonologist. Corrections in demographic variables were incorporated based on the experts opinion and suggestions.

PILOT STUDY

According to **Suresh.K.Sharma (2013**) pilot study is the miniature trial run of the methodology planned for the major research study, which facilitates to improve the methodology of the study, can assess the feasibility of the study and may identify the problems that may be faced by the researcher in the actual project.

After obtaining formal permission from the Managing Director at Kongunad hospitals the pilot study was conducted in the month of February 2018. Totally 12 patients were selected for this present study. On the first day of admission 2 patients who admitted and having diagnosed as COPD staged I, II as defined by GOLD were selected using non probability purposive sampling technique. Among the 12 samples, 6 samples were allocated for control group and 6 samples were allocated for experimental group. On the first day of admission respiratory rate, level of dyspnea and lung capacity were measured for both groups using

observation technique, modified borg's dyspnea scale and incentive spirometry respectively. The intervention, hemibridge with ball and balloon blowing exercise was administered on the first day for experimental group. Balloon blowing exercise was implemented with blowing up of commercially available balloon in 90/90hemibridge with ball and balloon position 3 times a day for 10-15minutes for 5 consecutive days .On the fifth day, day after 3 times of balloon blowing exercise post test was done to assess the respiratory rate, level of dyspnea and lung capacity by using same tool in experimental group. The intervention was with drawn for control group. On the 5thday post test was done. Hence the present study was found to be practicable and feasible.

DATA COLLECTION PROCEDURE

After obtaining prior formal permission from the Managing Director, Present study was conducted in month of March 2018.Procedure was explained clearly to the patients and obtained consent to be the participants of the study. Approximately 2-3 patients per day to conduct the present study. Totally 60 samples were selected using non probability purposive sampling technique. Out of 60 samples ,30 samples were allocated for experimental group and 30 samples were allocated for control group, who were admitted and having diagnosed as COPD staged I and II . On the first day of admission, in experimental group pre test was done to assess respiratory rate, level of dyspnea and lung capacity by using observation technique, dyspnea scale and incentive spirometry respectively. Balloon blowing exercise was administered for experimental group .The patients were asked to blow commercially available balloon given by the researcher. Balloon blowing exercise was implemented with blowing up of commercially available balloons in 90/90 hemibridge with ball and balloon position 3 times a day for 10-15minutes for 5consecutive days and measured and recorded in the recording sheet. On the fifth day after 3 times of balloon blowing exercise,post test assessment was done by using same observation technique, modified borg's dyspnea scale and incentive spirometer.

In control group pretest assessment was done to assess the respiratory rate, dyspnea score and lung capacity by using observational technique, dyspnea scale, incentive spirometry and the intervention was withdrawn front this group. Routine care was given to the control group. On the 5th day post test was done by using same tool in control group.

PLAN FOR DATA ANALYSIS

Analysis of the data was performed after collection of required data. Analysis was done based on the objectives and hypotheses of the study by using descriptive and inferential statistics.

Table No: 3.3 PLAN FORDATA ANALYSIS

Type of statistics	**Methods**	**Purpose**
Descriptive statistics	Frequency, Percentage, Mean, Standard deviation, Mean difference.	• Assess the demographic variables of patients admitted in hospital with COPD • Assess the respiratory rate, level of dyspnea and lung capacity among patients with COPD.
Inferential statistics	Paired t' test Independent t' test	• Compare mean pretest and posttest scores in experimental and control group among patients with COPD. • Compare the mean posttest scores between experimental and control group among patients with COPD.
	Chisquare test.	Association between pre test scores and their selected demographic variables.

SUMMARY

This chapter includes description of research approach, research design, study setting, target population, sample and sampling technique, selection criteria,

selection and development of the tool, content validity and reliability, pilot study, data collection procedures and plan for data analysis.

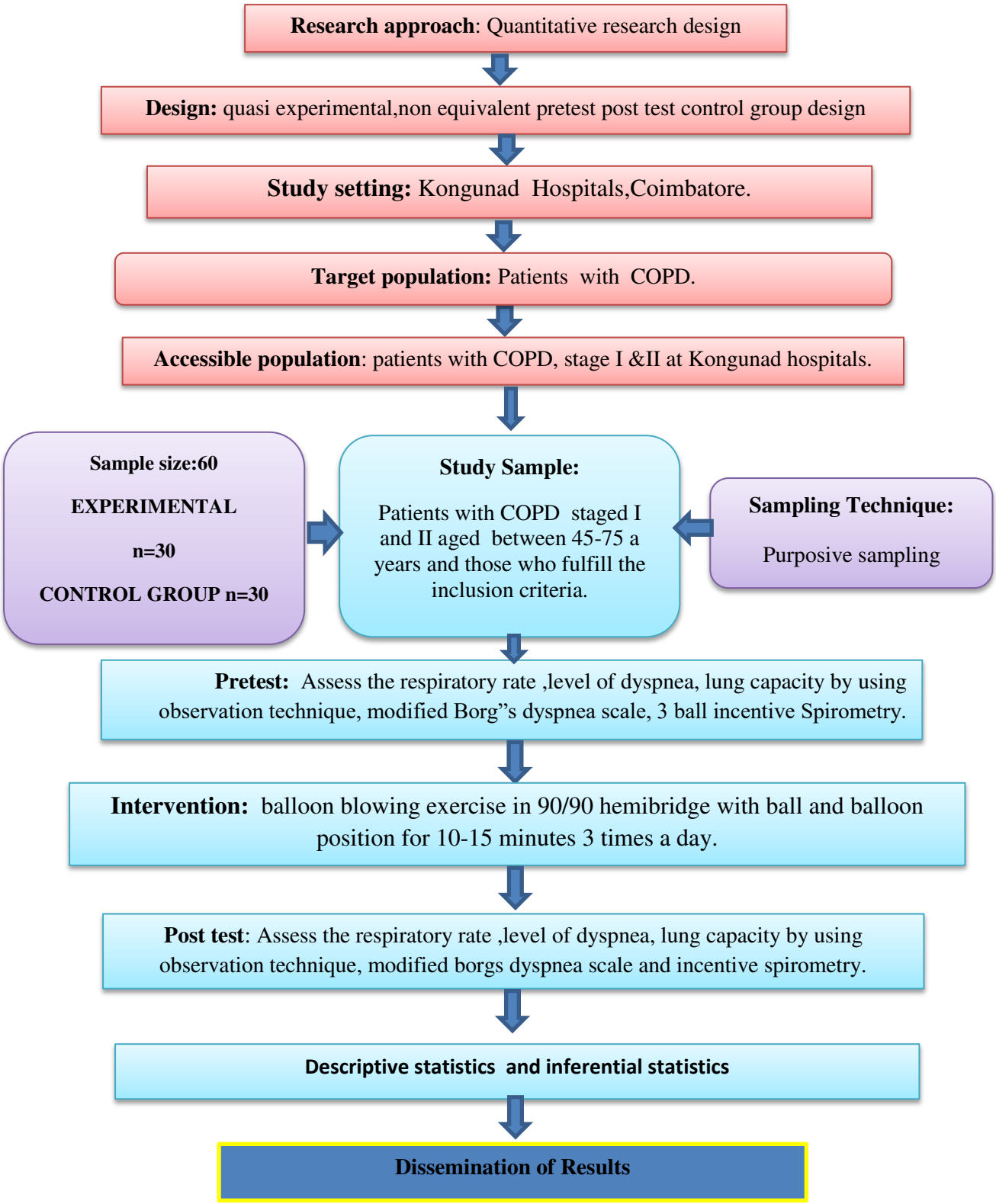

Fig:3.1 SCHEMATIC REPRESENTATION OF RESEARCH

CHAPTER- IV

ANALYSIS AND INTERPRETATION

According to **Polit and Hunglar (2006)**, analysis is a method of rendering data in quantitative, meaningful, and intelligible, so that the research problem can be studied and tested and the relationship between the variables can be found.

This chapter deals with analysis and interpretation of data collected from60 patients who were admitted in Kongunadu hospitals, Coimbatore in order to evaluate the effectiveness of balloon blowing exercise on respiratory status among patients with chronic obstructive pulmonary disease.

The collected data were analyzed by using descriptive and inferential statistics which are necessary to provide substantive summary by the results in relation to the objectives.

OBJECTIVES:

- To assess the respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease.
- To assess the effectiveness of balloon blowing exercise on respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease in experimental group.
- To associate the pretest level of respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease with their selected demographic variables.

PRESENTATION OF DATA:

The findings of the study were grouped, analyzed, organized and presented under following sections.

SECTION-A

Frequency and percentage distribution of samples according to their demographic variables.

SECTION-B

Comparison of pretest and posttest respiratory status among the patients with COPD.

Testing of hypotheses

SECTION-C

Effectiveness of balloon blowing exercise on respiratory status among patient with COPD.

H_1 : Significant difference between mean pretest and posttest scores of respiratory rate, level of dyspnea and lung capacity among Patients with Chronic obstructive pulmonary disease in experimental and control group.

H_2 : Significant difference between mean post test scores of respiratory rate, level of dyspnea and lung capacity among Patients with Chronic obstructive pulmonary disease in experimental and control group.

SECTION –D

Association between respiratory status among patients with COPD and their selected demographic variables

H_3 : Significant association between pre test score of respiratory status among patients with chronic obstructive pulmonary disease and their selected demographic variables.

SECTION-A

Distribution of samples according to their demographic variables in experimental and control group

Table.4.1 Frequency and percentage distribution of samples according to their demographic variables in experimental and control group

(n=30)

S.no	Demographic variables	Experimental group		Control group	
		F	%	F	%
1.	**Age in years.**				
	a) 45-55	10	33.3%	13	43.3%
	b) 56-65	11	36.7%	9	30%
	c) 66-75	9	30%	8	26.7%
2	**Gender.**				
	a) Female	4	13.3%	4	13.3%
	b) Male.	26	86.7%	26	86.7%
3	**Educational status**				
	a) Illiterate	6	20%	15	50%
	b) Primary education	7	23.3%	3	10%
	c) Secondary education	6	20%	5	16.7%
	d) Graduate	6	20%	4	13.3%
	e) Post graduate	5	16.7%	3	10%
5	**Occupational status**				
	a) Unemployed	11	36.7%	15	50%
	b) Self employed	6	20%	3	10%
	c) Private employee	7	23.3%	3	10%
	d) Government employee	6	20%	9	30%

S.no	Demographic variables	Experimental group		Control group	
		F	%	F	%
6	**Area of work**				
	a) Cotton industry	4	13%	3	10%
	b) Chemical industry	2	6.7%	3	10%
	c) Mining industry	0	-	1	3.3%
	d) Other	24	80%	23	76.7%
7	**BMI**				
	a) <18	15	50%	11	36.7%
	b) 19-21	8	27%	9	30%
	c) 22-25	7	23%	10	33.3%
	d) >25	-	-	-	-
8	**Comorbid illness**				
	a) Anemia	-	-	3	10%
	b) Hereditary disease	15	50%	12	40%
	c) None	15	50%	15	50%
8	**Family history of COPD**				
	a) Yes	14	46.7%	18	60%
	b) No	16	53.3%	12	40%
9	**Smoking habit**				
	a) Yes	24	80%	20	66.6%
	b) No	6	20%	10	33.4%
10	**Regular practice of exercises**				
	a) Yes	2	6.3%	3	10%
	b) No	28	93.7%	27	90%

SECTION-A

Percentage distribution of samples according to their demographic variables

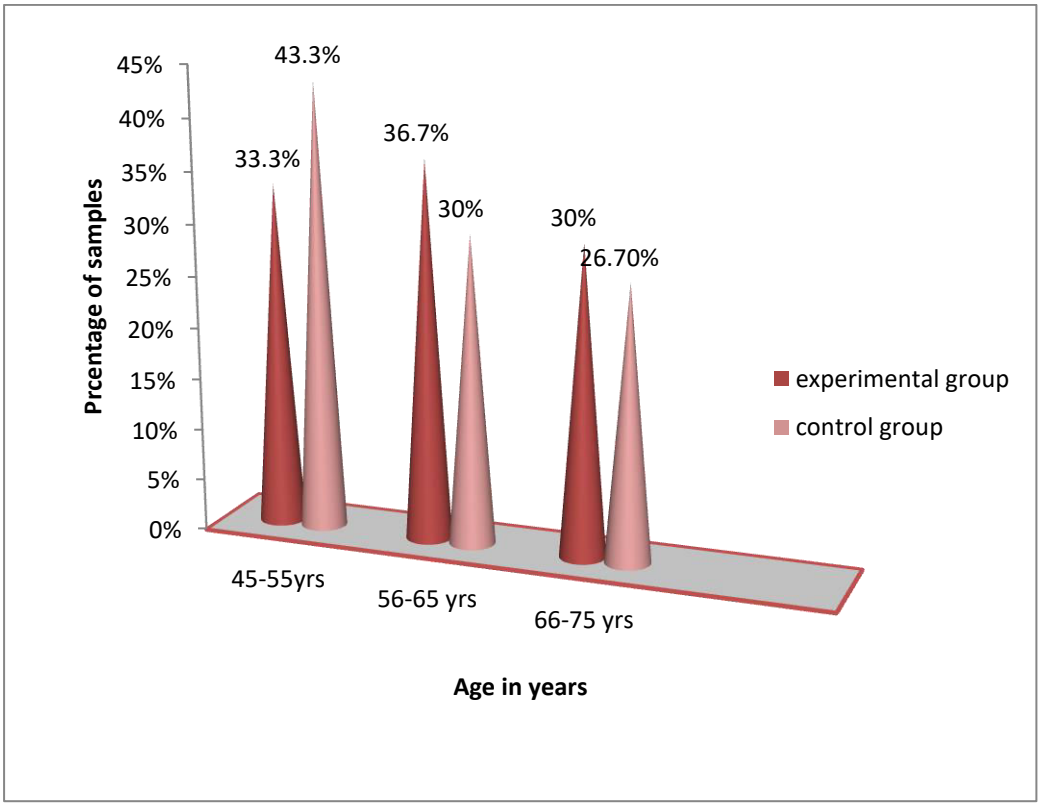

Fig.4.1.1 Percentage distribution of samples according to their age in experimental and control group

The above figure 4.1.1 shows that in experimental group, 10(33.3%) samples were in the age group of 45-55 yrs,11(36.7%) samples in the age group of 56-65 years, 9(30%) samples in the age group of 66-75 years.

In the control group, 13(43.3%) samples were in the age group of 45-55 yrs,9(30%) samples in the age group of 56-65 years, 8(26.7%) samples in the age group of 66-75 years.

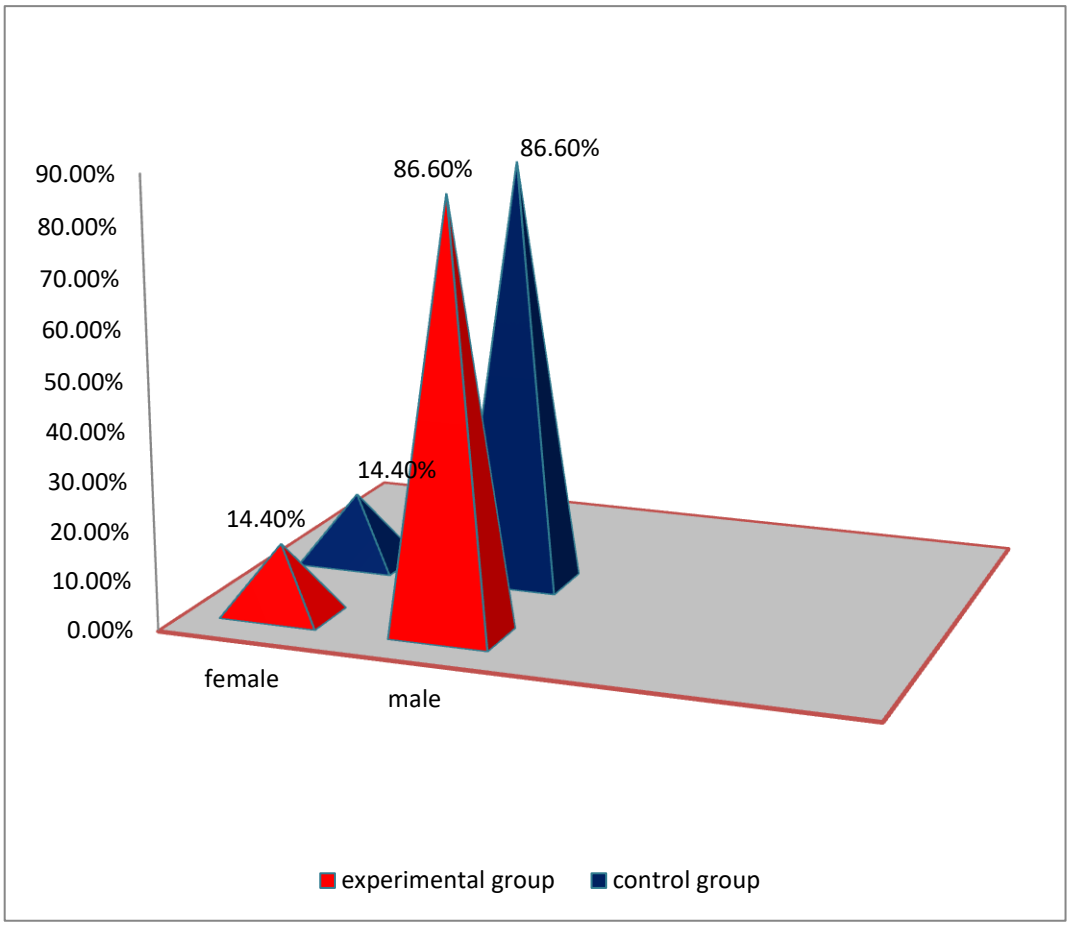

Fig 4.1.2 Percentage distribution of the samples according to their gender in experimental and control group

The above figure 4.1.2 shows that in both experimental group and controlgroup4(14.4%) samples were females, 26(86.6%) samples were males.

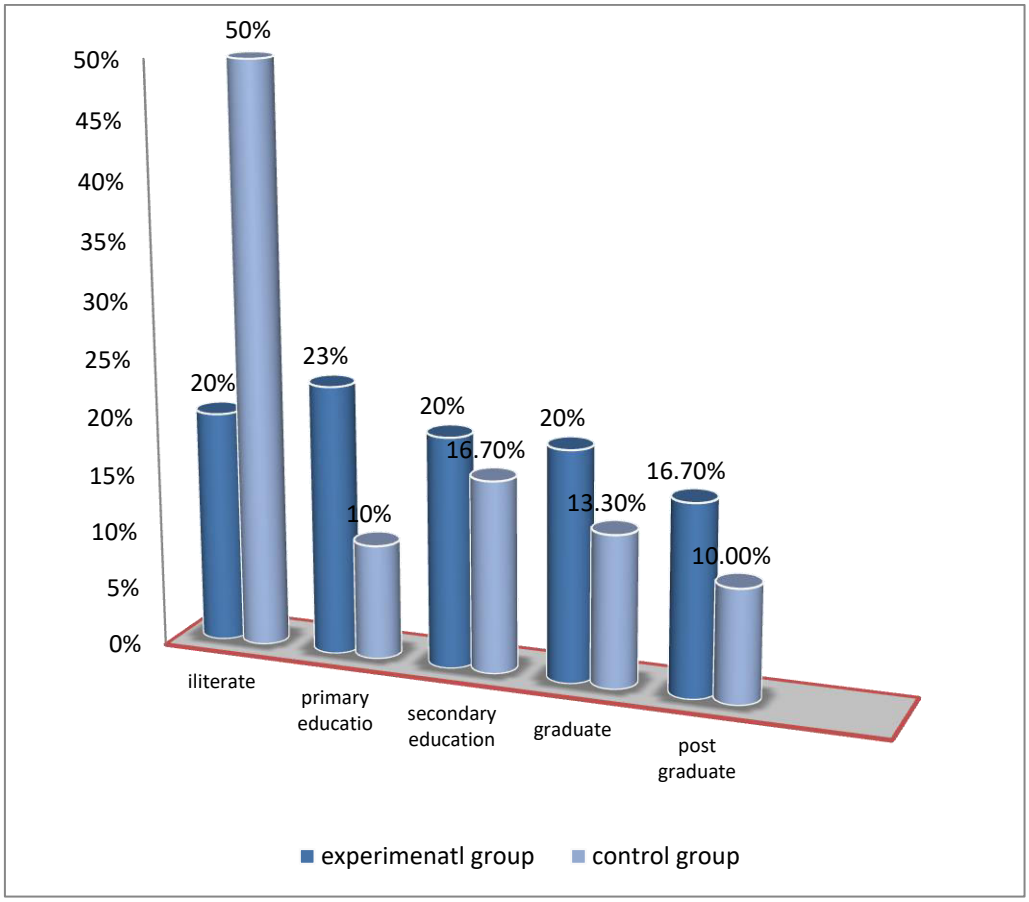

Fig.4.1.3 Percentage distribution of samples according to their educational status in experimental and control group

The above figure 4.1.3 shows that in experimental group, 6(20%) samples were iliterate,7(23.3%) samples were with primary education , 6(20%) samples were with secondary education,6(20%) samples were graduates, 5(16.7%) samples were post graduates.

In the control group, 15(50%) samples were iliterate,3(10%) samples were with primary education, 5(16.7%) samples were with secondary education, 4(13.3%) samples were graduate , 3(10%) samples were post graduate.

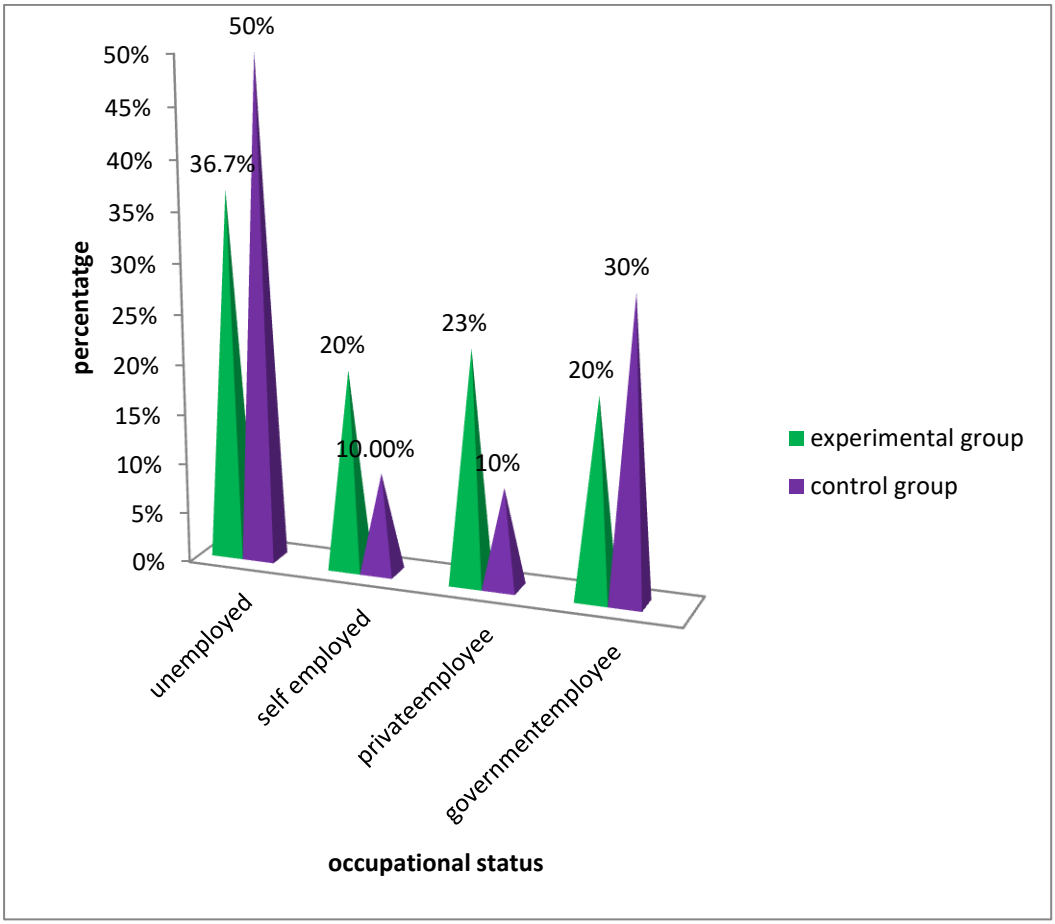

Fig.4.1.4 Percentage distribution of samples according to their occupational status in experimental and control group

The above figure 4.1.4 shows that in experimental group, 11(36.7%) samples were unemployed,6(20%) samples were self employee , 7(23.3%)majority of samples were private employee, 6(20%) samples were government employees.

In the control group, 15(50%) samples were un employee, 3(10%) samples were self employee,3(10%) samples were private employee, 9(30%) samples were government employees.

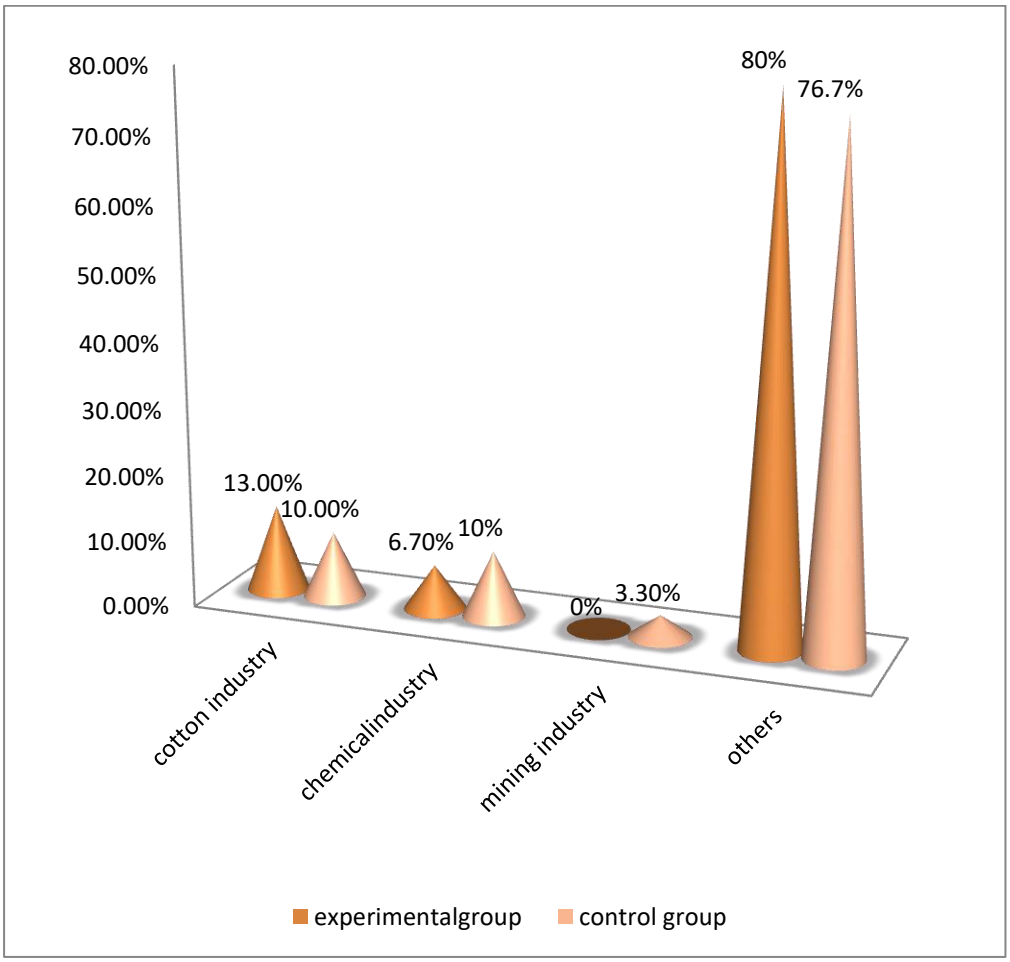

Fig.4.1.5 Percentage distribution of samples according to their area of work in experimental and control group

The above figure 4.1.5 shows that in experimental group, majority of samples 24(80%) were other workers,4(13%) were cotton industry workers,2(6.7%) were chemical industry workers

In the control group, 3(10%) samples were cotton industry worker,3(10%) samples were chemical industry worker, 1(3.3%) samples were mining industry workers, 23(76.7%) samples were other workers.

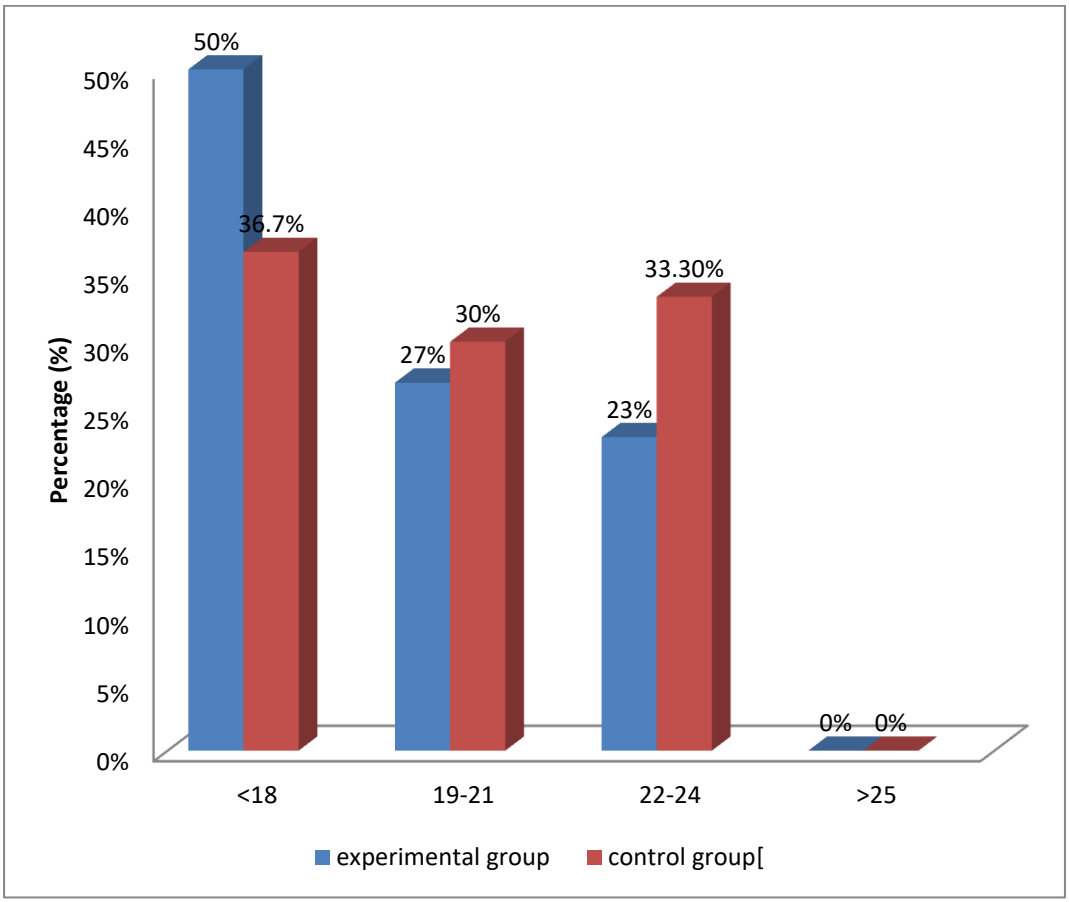

Fig.4.1.6 Percentage distribution of samples according to their body mass index in and control group

The above figure 4.1.6 shows that in experimental group, majority of samples 15(50%) were less than 18,8(27%) samples were chemical in between 19-21 , 7(23%)samples were in between 22-25 .

In the control group, 11(36.7%) samples were less than 18,9(30%) samples were in between 19-21, 10(33.3%) samples were between 22-25. No samples were in 25 above in both experimental and control group.

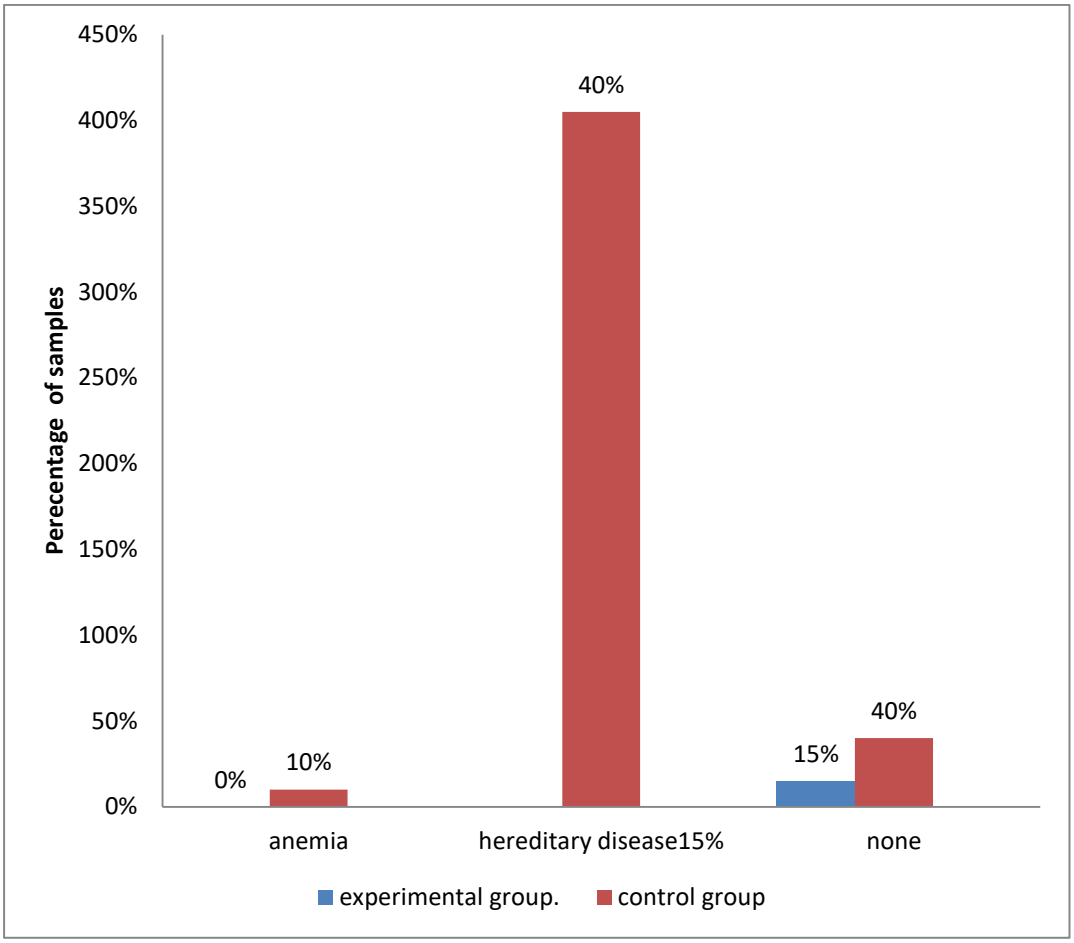

Fig.4.1.7 Percentage distribution of samples according to the comorbid illness in experimental and control group

The above figure 4.1.7 shows that in experimental group , half of samples 15(50%) were having hereditary diseases, 15(50%) samples were not diseased.

In the control group, 3(10%) samples were anemic,12(40%) samples were hereditary diseases,15(50%) samples were not having any diseases.

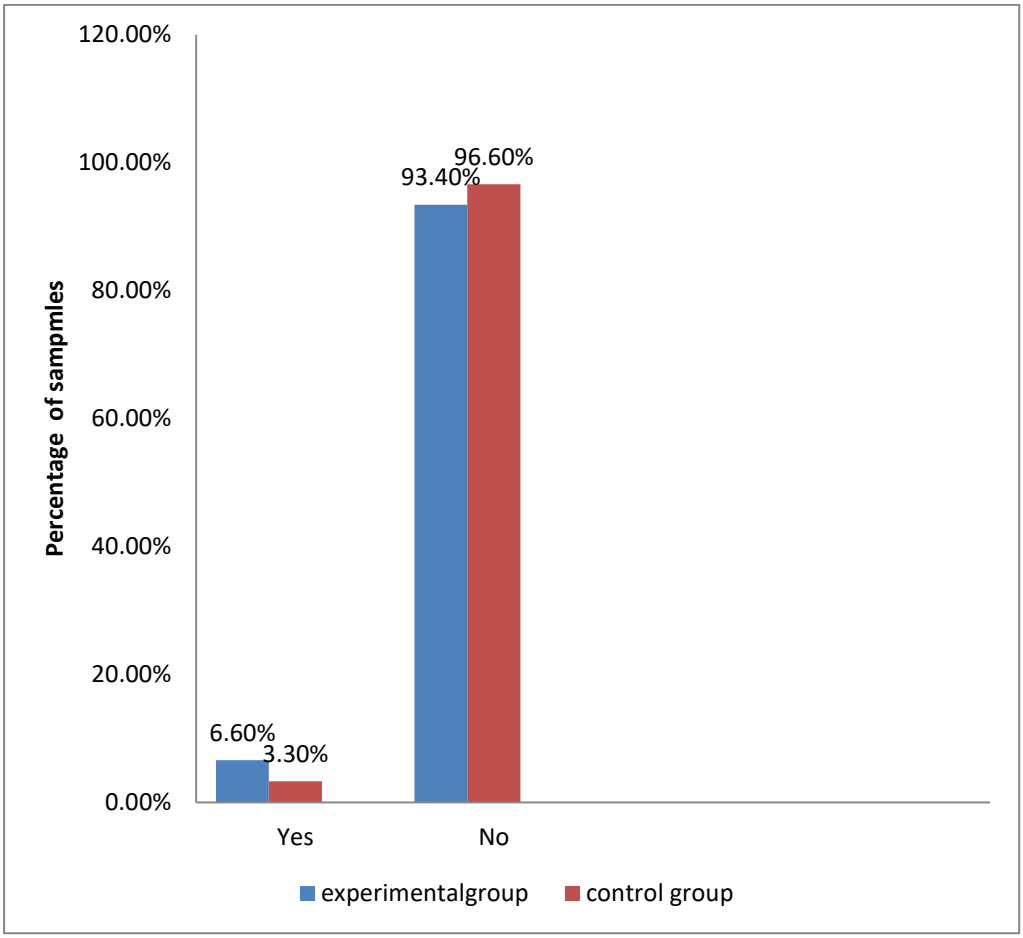

Fig.4.1.8 Percentage distribution of samples on family history of COPD in experimental and control group

The above figure 4.1.8 shows that in experimental group , majority of samples 14(46.7%) were not having the family history of COPD, 16(53.3%) samples were not having the family history of COPD.

In the control group, 18(60%) samples were not having history of COPD,12(40%) samples were Having history of COPD.

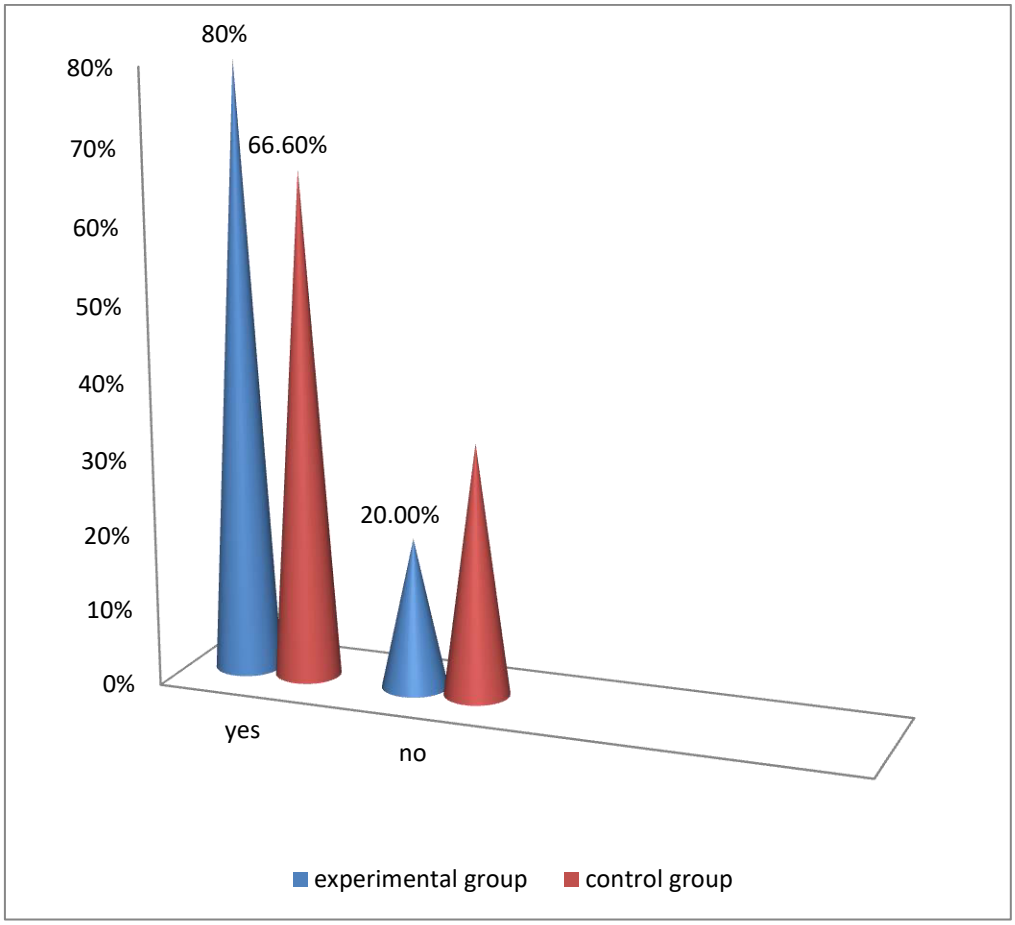

Fig.4.1.9 Percentage distribution of samples on smoking habit in experimental and control group

The above figure 4.1.9 shows that in experimental group, majority of samples 24(80%) were not having smoking habit, 6(20%) samples were smokers.

In the control group, majority of samples 20(66.6%) samples were non smokers ,10(33.4%) samples were smokers.

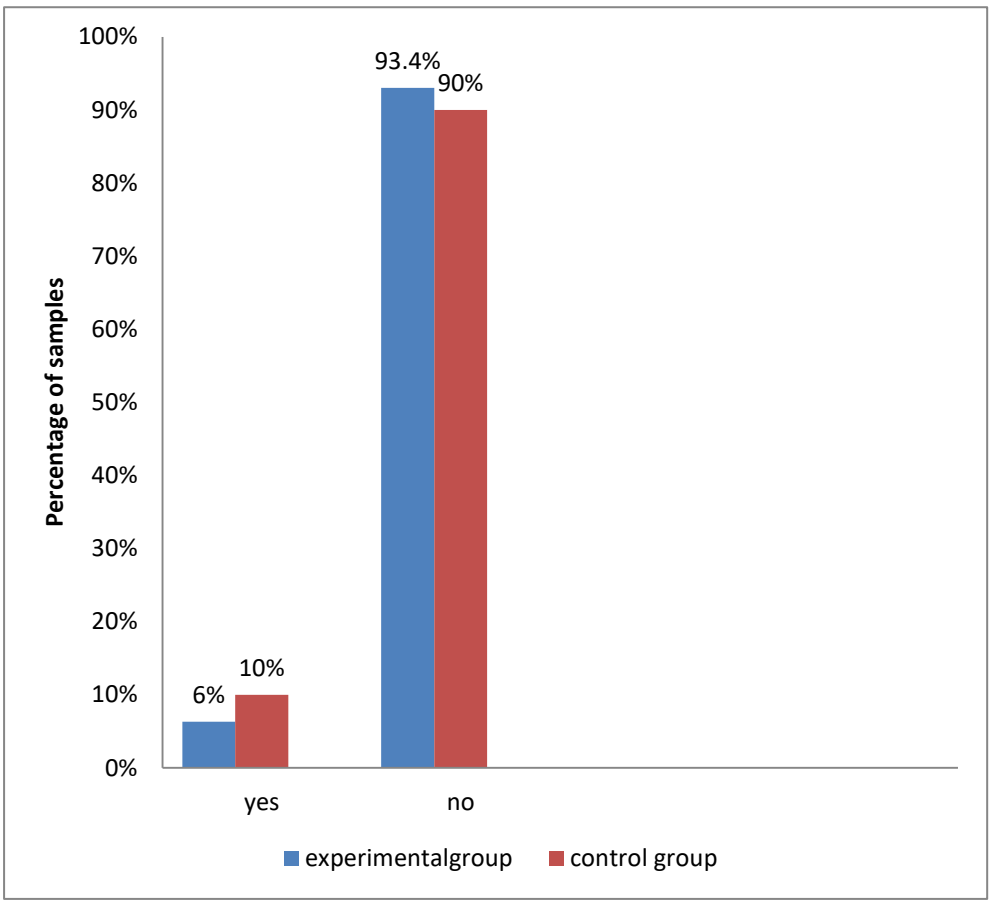

Fig.4.1.10 Percentage distribution of samples on regular practice of exercise in experimental and control group

The above figure 4.1.1 shows that in experimental group , majority of samples 28(93.4%) were non regular practicers of exercise,2(6.3%) samples were regular practicers of exercise.

In the control group, majority of samples 27(90%) samples were regular practicers of exercise, 3(10%) were on regular practicers of exercise.

SECTION-B

Assessment of level of dyspnea and lung capacity among patients with chronic obstructive pulmonary disease

Table.4.2.1 Frequency and percentage distribution of level of dyspnea among samples during pretest and posttest in experimental group.

level of dyspnea	Pretest		Posttest	
	n	%	n	%
Nothing at all	0	0	7	23.3%
Very Very slight (0.5)	0	0	6	20%
Very Slight(1)	5	16%	11	36.7%
Slight (2)	12	40%	5	16%
Moderate(3)	9	30%	1	3.3%
Somewhat severe(4)	4	13.3%	0	0

Table.4.2.1 shows that in pretest, one -third 12(40%) of the samples had slight level of dyspnea whereas 9(30%) of the samples had moderate level of dyspnea ,5(16%) had very slight level of dyspnea and least 4(13.3%) of the samples had somewhat severe level of dyspnea

During posttest, most of the samples 11(36.7%) had very slight level of dyspnea,7(23.3%) of samples had nothing at all, 6(20%) had very very slight level of dyspnea, 5(16%) samples had slight level of dyspnea and least of 1(3.3%) had moderate level of dyspnea and none(0%) had somewhat severe level of dyspnea in experimental group .

Table.4.2.2 Percentage distribution of level of dyspnea among samples during pretest and posttest in control group.

Dyspnea score	Pretest		Posttest	
	n	%	n	%
Nothing at all (0)	0	0	4	13.3%
very very slight (0.5)	2	6.7%	3	10%
Very slight(1)	5	16.7%	7	23.3%%
Slight(2)	9	30%	11	36.7%
Moderate(3)	11	36.7%	5	16.7%
Somewhat severe(4)	3	10%	0	0

Table.4.2.2 shows that in pretest, most 11(36.7%) of the samples had moderate level of dyspnea whereas 9(30%) of the samples had slight level of dyspnea, 5(16.6%) had very slight level of dyspnea, least 3(10%) of the samples had somewhat severe level of dyspnea,2(6.7%) had very very slight level of dyspnea and none 0% had nothing at all.

During posttest, more number of the samples 11(36.7%) had slight level of dyspnea,7(23.3%) of samples had very slight level of dyspnea,5(16.7%%) of samples had moderate level of dyspnea and least of 3(10%) samples had just noticeable level of dyspnea and 5(16.7%) had moderate and somewhat severe level of dyspnea in experimental group.

Table.4.2.3 Frequency and percentage distribution of lung capacity among samples during pretest and posttest in experimental group.

Lung capacity	Pretest		Posttest	
	n	%	n	%
600cc	22	73.3%	0	0
900cc	8	26.7%	24	80%
1200cc	0	0	6	20%

+

Table.4.2.3 shows that majority of the samples 22(73.3%) in pretest had lung capacity of 600cc/minute, comparatively less samples 8(26.7%) had lung capacity of 900cc/minute and none (0%) had lung capacity of 1200 cc/minute.

During posttest, higher percentage of samples 24(80%) had 900cc/minute,6(20%) samples had 1200cc/minute and none (0%) had 600cc/minute.

Table.4.2.4 Frequency and percentage distribution of lung capacity among samples during pretest and posttest in control group.

Lung capacity	Pretest		Posttest	
	n	**%**	**N**	%
600cc	27	90%	27	90%
900cc	3	10%	3	10%
1200cc	0	0	0	0

Table.4.2.3 shows that majority of the samples 27(90%) in pretest and posttest had lung capacity of 600cc/minute, comparatively less samples 3(10%) had lung capacity of 900cc/minute and none of the samples (0%) had lung capacity of 1200 cc/minute.

SECTION –C

Effectiveness of balloon blowing exercise on respiratory status among patients with chronic obstructive pulmonary disease.

Table 4.3 Mean, Standard deviation, Mean difference and Paired 't' test values on respiratory status in experimental group and control group.

n=60

Group	Pretest		Posttest		Mean difference	Paired t test	df
	Mean	S.D	Mean	S.D			
Experimental group							
Respiratory rate	21.1	2	18	2.4	3.1	****12.5**	
Level of dyspnea	2.4	0.7	1.5	0.5	0.9	****6.7**	
Lung capacity	0.7	0.2	1.32	0.7	0.6	****8.2**	
Control group							29
Respiratory rate	23.7	3.5	22.4	2.7	1.3	1.8	
Level of dyspnea	2.3	1.1	1.6	0.9	0.7	2.5	
Lung capacity	0.4	0.6	0.7	0.1	0.3	1.8	

Table value-2.7 df=29 ** Highly significant p<0.01

The above table 4.3 shows that in experimental group, the over all mean score on respiratory rate among patients with COPD reveals that 21.1±2 mean in pretest and 18±2.4 in post test respectively. The mean difference was 3.1 and calculated paired t test value (t= 12.5)which was highly significant at p<0.05

In control group, the over all mean score on respiratory rate among patients with COPD reveals that 23.7±3.5 mean in prettest and 22.4±2.7mean in post test. in experimental group, the over all mean score on level of dyspnea

among patients with COPD reveals that2.4±0.7 mean in pretest and1.5±0.5 in post test respectively .The mean difference was 0.9 and calculated paired t test value(t= 6.7)which was highly significant at $p<0.05$.

In control group, the over all mean score on level of dyspnea reveals that 0.4±0.6 mean in pretest and1.6±0.9 in post test.

In experimental group, the over all mean score on lung capacity reveals that 0.7±0.2 mean and in posttest 1.32±0.7. The mean difference was 0.6 and the calculated independent t test value was 8.7 which is highly significant $p<0.05$.

In control group, the pretest mean score on lung capacity was 0.6±0.4 and in posttest 0.7±0.1.

Hence, H_1 is retained balloon blowing exercise was effective in improving the respiratory status among patients with COPD**.**

Table4.3.1 Mean, Standard deviation and independent t" test value on posttest respiratory rate, level of dyspnea and lung capacity in experimental group and control group.

Group	Posttest		Independent t' test value
	Mean	S.D	
Experimental group			
Respiratory rate	18	2.4	
Level of dyspnea	1.5	0.5	
Lung capacity	1.32	0.7	***5.8**
Control group			***4.2**
Respiratory rate	22.4	2.7	**86.9**
Level of dyspnea	1.6	0.9	
Lung capacity	0.7	0.1	

Table value-2.66 df= 58 ** highly significant at p<0.01

In experimental group, the posttest mean score on respiratory rate among patients with COPD was 18±2.4, mean score on level of dyspnea was 1.5±0.5, and mean score on lung capacity was 1.32±0.7, the calculated independent t test value on respiratory rate was 5.8, level of dyspnea was 4.2 and lung capacity was 6.9 respectively.

Hence,H2 is retained. Balloon blowing exercise is effective in improving the respiratory status among patients with COPD.

SECTION-D

Association between the respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease and their selected demographic variables.

Table.4.4.1Association between the respiratory rate among patients with chronic obstructive pulmonary disease and their selected demographic variables

n=60

S.No.	Demographic variables	Respiratory rate					
		Above median		Below median		Table value	Chi square
		n	%	n	%		
1	**Age in years**						
	a) 45-55	6	20%	7	23.3%	9.2	$\chi^{2=5}$.2 Df=2
	b) 56-65	5	16.6%	4	13.3%		
	c) 66-75	4	13.33%	4	13.3%		
2	**Gender**						
	a) Female	1	3.3%	3	10%	**6.6**	**$\chi^{2=}$29.4 Df=2**
	b) Male	10	33.33%	16	3.3%		
3	**Educational status**						
	a) Illiterate	2	6.6%	4	13.3%	9.4	χ^2=9.2Df=4
	b) Primary education	2	6.6%	5	16.6%		
	c) Secondary education	2	6.6%	4	13.3%		
	d) graduate	2	6.6%	4	13.3%		
	e) post graduate.	4	13.33%	1	3.3%		
4	**Occupational status**						
	a) Unemployee	1	3.3%	2	6.65	7.8	χ^2=7.3 Df=3
	b) Self employee	0	0	2	6.6%		
	c) Private employee	7	23.3%	8	26.6%		
	d) government employee	4	13.33%	6	20%		

	Demographic variables	Respiratory rate					
		Above median		Below median		Table value	Chi square
		n	%	n	%		
5	**Area of work**						
	a) Cottonindustry	0	0	5	16.6%		
	b) Chemical	1	3.35	1	3.3%		
	industry	0	0	0	0	7.8	χ^2=7.3 Df=3
	c) mining	11	36.6%	12	40%		
	industry						
	d) others						
6	**BMI**						
	a) <18	4	13.3%	11	36.6%		
	b) 19-21	3	10%	5	16.6%	***11.3**	**χ^2=25.2 Df=3**
	c) 22-25	5	16.6%	2	6.6%		
	d) >25	0	0	0	0		
7	**Comorbid illness**						
	a)anemia	0	0	0	0		χ^2=7.2
	b) hereditary illness	3	10%	13	43.3%	9.2	Df=2
	c) none	8	26.6%	6	20%		
8	**Family history of COPD**						
	a) Yes	3	10%	13	43.3%	20	**χ^2=6.6 Df=1**
	b) No	9	30%	5	16.6%		
9	**History of smoking**						
	a) Yes	4	13.3%	2	6.6%	**6.6**	**χ^2=27.7 Df=1**
	b) No	7	2.3%	17	56.6		
10	**Regular practices of exercise**						
	a) Yes	1	3.3%	2	6.6%	**6.6**	**χ^2=21.1 Df=1**
	b) No	8	26.6%	19	63.3%		

In experimental group, there was significant association found between the pretest respiratory rate and demographic variables and clinical variables in age (χ^2=29.4),gender (χ^2=29.4),body mass index (χ^2=25.2),family history of COPD (χ2=20),history of smoking (χ^2=27.7), regular practices of exercise (χ^2=21.1).Whereas all other demographic variables such as age, gender, educational status, occupational status, area of work, comorbid illness were not associated . Hence, the hypothesis H_3 is retained for body mass index family history of COPD, history of smoking, regular practices of exercise and rejected for other variables in experimental group.

In experimental group, there was significant association found between the pretest level of dyspnea and demographic variables and clinical variables in gender (χ^2=24.9), family history of COPD (χ^2=11.3), history of smoking (χ^2=16.1) regular practices of exercise (χ^2 =27.7). Whereas all other demographic variables such as age, educational status, occupational status, comorbid illness, BMI, area of work, family history of COPD, history of smoking were not associated. Hence, the hypothesis H_3 is retained for gender, regular practices of exercise and rejected for other variables in experimental group.

In experimental group, there was significant association found between the pretest lung capacity and demographic variables and clinical variables in age (χ^2 =33.1), gender (χ^2 =24.9), BMI (χ^2=31.6), family history of COPD (χ^2 =31.7), history of smoking (χ^2=32.2), regular practices of exercise (χ^2 =24.6). Whereas all other demographic variables such as educational status, occupational status, comorbid illness, area of work, were not associated. Hence, the hypothesis H_3 is retained for age, gender, BMI, family history of COPD, history of smoking, regular practices of exercise and rejected for other variables in experimental group.

In experimental group, there was significant association found between the pretest respiratory rate and demographic variables and clinical variables in body mass index family history of COPD, history of smoking, regular practices of exercise. Whereas all other demographic variables such as age, gender, educational status, occupational status, area of work, comorbid illness were not associated .

Hence, the hypothesis H_3 is retained for body mass index family history of COPD, history of smoking, regular practices of exercise and rejected for other variables in experimental group.

Table.4.4.2 Association between the level of dyspnea among patients with chronic obstructive pulmonary disease and their selected demographic variables

n=30

S.No.	Demographic variables	Level of dyspnea					
		Above median		Below median		Table value	Chi square
		n	%	n	%		
1	**Age in years**						
	a) 45-55	8	26.6%	2	6.6%		
	b) 56-65	9	30%	2	6.6%	9.2	χ^2=6.2
	c) 66-75	10	33.3%	0	0		Df=1
2	**Gender**						
	a) Female	3	10%	1	3.3%	***6.6**	**χ^2=24.9**
	b) Male	19	63.3%	7	23.3%		**Df=1**
3	**Educational status**						
	a) Illiterate	5	16.6%	1	3.3%		
	b) Primary education	6	20%	1	3.3%		χ^2=6.3
	c) Secondary education	6	20%	0	0	9.4	Df=3
	d) Graduate	4	13.3%	2	6.6%		
	e) Post graduate	5	16.6%	0	0		
4	**Occupational status**						
	a) Unemployee	1	3.3%	2	6.65%		χ^2=5.1
	b) Self employee	0	0	2	6.6%	7.8	Df=3
	c) Private employee	7	23.3%	8	26.6%		
	d) Government employee	4	13.33%	6	20%		

S.No.	Demographic variables	Level of dyspnea				Table value	Chi square
		Above median		Below median			
		N	%	N	%		
5	**Area of work**						
	a) Cotton industry	3	10%	1	3.3%	7.8	χ^2=5.1 Df=3
	b) Chemical industry	2	6.6%	0	0		
	c) mining industry	0	0	0	0		
	d) others	19	63.3%	5	16.6%		
6	**BMI**						
	a) <18	13	43.3%	2	6.6%	11.3	χ^2=9.4 Df=3
	b) 19-21	6	20%	2	6.6%		
	c) 22-25	7	23.3%	0	0		
	d) >25	0	0	0	0		
7	**Comorbid illness**						
	a) Anemia	0	0	0	0	9.2	χ^2=9 Df=2
	b) hereditary illness	12	40%	10	33.3%		
	c) None	13	43.3%	15	50%		
8	**Family history of COPD**					**6.6**	**χ^2=11.3 Df=1**
	a) Yes	14	46.6%	4	13.3%		
	b) No	10	33.3%	2	6.6%		
9	**History of smoking**					**6.6**	**χ^2=5.1 Df=1**
	a) Yes	22	73.3%	2			
	b) No	5	16.6%	1			
10	**Regular practices of exercise**	1		1		**6.6**	**χ^2=6.6 Df=1**
	f) Yes	11		17			
	g) No						

In experimental group, there was significant association found between the pretest level of dyspnea and demographic variables and clinical variables in gender, regular practices of exercise. Whereas all other demographic variables such as age, educational status, occupational status, comorbid illness, BMI, area of work, family history of COPD, history of smoking were not associated . Hence, the hypothesis H_3 is retained for gender, regular practices of exercise and rejected for other variables in experimental group.

Table.4.4.3 Association between the lung capacity among patients with chronic obstructive pulmonary disease and their selected demographic variables

n=30

S. No.	Demographic variables	Respiratory rate					
		Above median		Below median		Table value	Chi square
		n	%	n	%		
1	**Age in years**						
	a) 45-55	6	20%	4	13.3%	9.2	χ^2=9.2 Df=1
	b) 56-65	1	3.3%	10	33.3%		
	c) 66-75	7	23.3%	12	40%		
2	**Gender**						
	a) Female	3	10%	1	3.3%	*6.	**χ^2=24.9 Df=1**
	b) Male	19	63.3%	7	23.3%	6	
3	**Educational status**						
	a) Illiterate	2	6.6%	5	16.6%		
	b) Primary education	3	10%	4	13.3%	9.4	χ^2=6.6 Df=3
	c) Secondary Education	2	6.6%	6	20%		
	d) Graduate	1	3.3%	5	16.6%		
	e) Post graduate	1	3.3%	6	20%		
4	**Occupational status**						
	b) Unemployee	1	3.3%	2	6.65%		χ^2=5.1 Df=3
	b) Self employee	0	0	2	6.6%	7.8	
	c) Private employee	7	23.3%	8	26.6%		
	d) Government employee	4	13.33%	6	20%		
5	**Area of work**						
	a) Cotton industry	1	3.3%	4	13.3%		χ^2=9.2 Df=3
	b) Chemical Industry	0	0	2	6.6%	7.8	
	c) Mining industry	0	0	14	3.3%		
	d) Others	6	20%		46.6%		

S. No.	Demographic variables	Respiratory rate					
		Above median		Below median		Table value	Chi square
		n	%	n	%		
6	**BMI** a) <18 b) 19-21 c) 22-25 d) >25	 3 3 2 -	 10% 10% 6.6%	 12 5 5 -	 40% 16.6% 16.6% -	7.8	χ^2=9.2 Df=3
7	**Comorbid illness** a) Anemia b) Hereditary illness c) None	0 7 7	- 23.3% 23.3%	0 9 7	0 30% 23.3%	11.3	χ^2=11.3 Df=3
8	**Family history of COPD** a) Yes b) No	1 7	3.3% 23.3%	1 21	3.3% 70%	9.2	χ^2=9.2 Df=2
9	**History of smoking** a) Yes b) No	2 6	6.6% 20%	4 18	23.3% 60%	**6.6**	**χ^2=6.6 - Df=1**
10	**Regular practices of exercise** **a)** Yes b) No	1 7	3.3% 23.3%	0 22	0 73.3%.	**6.6**	**χ^2=6.6 Df=1**

In experimental group, there was significant association found between the pretest lung capacity and demographic variables and clinical variables in age, gender, BMI, family history of COPD, history of smoking, regular practices of exercise. Whereas all other demographic variables such as educational status, occupational status, comorbid illness, area of work, were not associated. Hence, the hypothesis H_3 is retained for age, gender, BMI, family history of COPD, history of smoking, regular practices of exercise and rejected for other variables in experimental group.

CHAPTER-V

DISCUSSION

This study focused on evaluating the effectiveness of Balloon blowing exercise on respiratory status among patients with chronic obstructive pulmonary disease at a selected hospital, Coimbatore. This chapter presents the main findings of the study

Distribution of samples according to their demographic variables.

In experimental group, 10(33.3%) samples were in the age group of 45-55 yrs,11(36.7%) samples in the age group of 56-65 years, 9(30%) samples in the age group of 66-75 years.

In the control group, 13(43.3%) samples were in the age group of 45-55 yrs,9(30%) samples in the age group of 56-65 years, 8(26.7%) samples in the age group of 66-75 years.

In both experimental group and controlgroup4(14.4%) samples were females, 26(86.6%) samples were males.

In experimental group, 6(20%) samples were iliterate,7(23.3%) samples were with primary education, 6(20%) samples were with secondary education,6(20%) samples were graduates, 5(16.7%) samples were post graduates.

In the control group, 15(50%) samples were iliterate,3(10%) samples were with primary education, 5(16.7%) samples were with secondary education, 4(13.3%) samples were graduate , 3(10%) samples were post graduate.

That in experimental group , 11(36.7%) samples were unemployed,6(20%) samples were self employee , 7(23.3%)majority of samples were private employee,6(20%) samples were government employees.

In the control group, 15(50%) samples were un employee, 3(10%) samples were self employee,3(10%) samples were private employee, 9(30%) samples were government employees.

That in experimental group, majority of samples 24(80%) were other workers,4(13%) were cotton industry workers,2(6.7%) were chemical industry workers

In the control group, 3(10%) samples were cotton industry worker,3(10%) samples were chemical industry worker, 1(3.3%) samples were mining industry workers, 23(76.7%) samples were other workers.

In experimental group, majority of samples 15(50%) were less than 18,8(27%) samples were chemical in between 19-21, 7(23%) samples were in between 22-25.

In the control group, 11(36.7%) samples were less than 18,9(30%) samples were in between 19-21, 10(33.3%) samples were between 22-25. No samples were in 25 above in both experimental and control group.

That in experimental group, half of samples 15(50%) were having hereditary diseases, 15(50%) samples were not diseased.

In the control group, 3(10%) samples were anemic,12(40%) samples were hereditary diseases,15(50%) samples were not having any diseases.

In experimental group , majority of samples 14(46.7%) were not having the family history of COPD, 16(53.3%) samples were not having the family history of COPD.

In the control group, 18(60%) samples were not having history of COPD,12(40%) samples were Having history of COPD.

In experimental group, majority of samples 24(80%) were not having smoking habit, 6(20%) samples were smokers.

In the control group, majority of samples 20(66.6%) samples were non smokers ,10(33.4%) samples were smokers.

That in experimental group , majority of samples 28(93.4%) were non regular practicers of exercise,2(6.3%) samples were regular practicers of exercise.

In the control group, majority of samples 27(90%) samples were regular practicers of exercise, 3(10%) were on regular practicers of exercise.

The first objective was to assess the respiratory rate, level of dyspnea and lung capacity.

In experimental group, pretest, highest percentage 15(50%) of the samples had slight dyspnea score whereas 9(30%) of the samples had moderate dyspnea score and least 4(13.3%) of the samples had somewhat severe dyspnea score

During posttest, most of the samples 17(56.6%) had slight dyspnea,7(23.3%) of samples had no dyspnea, and least of 4(13.3) samples had just noticeable dyspnea and none(0%) had moderate and somewhat severe dyspnea in experimental group respectively.

In experimental group, majority of the samples 22(73.3%) in pretest had lung capacity of 600cc/m, comparatively less samples 8(26.6%) had lung capacity of 900cc/m and none (0%) had lung capacity of 1200 cc/m.

During posttest, higher percentage of samples 24(80%) had 900cc/m,6(20%) samples had 1200cc/m and none (0%) had 600cc/m.

The second objective was to assess the effectiveness of balloon blowing exercise on respiratory status among patients with chronic obstructive pulmonary disease

In experimental group, the over all mean score on respiratory rate among patients with COPD reveals that 21.1±2 mean in pretest and 18±2.4 in post test respectively .The mean difference was 3.1 and calculated paired t test value(t= 12.5) which was highly significant at $p<0.05$

In control group, the over all mean score on respiratory rate among patients with COPD reveals that 23.7±3.5 mean in prettest and 22.4±2.7mean in post test.

In experimental group, the over all mean score on level of dyspnea among patients with COPD reveals that2.4±0.7 mean in pretest and1.5±0.5 in post test respectively .The mean difference was 0.9 and calculated paired t test value (t= 6.7)which was highly significant at p<0.05.

In control group, the over all mean score on level of dyspnea reveals that 0.4±0.6 mean in pretest and1.6±0.9 in post test.

In experimental group, the over all mean score on lung capacity reveals that 0.7±0.2 mean and in posttest 1.32±0.7 . The mean difference was 0.6 and the calculated independent t test value was 8.7 which is highly significant p<0.05

In control group, the pretest mean score on lung capacity was 0.6±0.4 and in posttest 0.7±0.1. Hence, H_1 is retained balloon blowing exercise was effective in improving the respiratory status among patients with COPD**.**

In experimental group, the posttest mean score on respiratory rate among patients with COPD was 18±2.4 ,mean score on level of dyspnea was 1.5±0.5 and mean score on lung capacity was 1.32±0.7,the calculated independent t test value on respiratory rate was 5.8, level of dyspnea was 4.2 and lung capacity was 6.9 respectively.

Hence, H2 is retained. Balloon blowing exercise is effective in improving the respiratory status among patients with COPD. **Jorida fernandes and akshay chougule (2017)** conducted a similar study on effects of 90/90 hemibridge with ball and balloon position on forced expiratory volume and vital capacity among 30msample.The researcher concluded that there is an immediate effect of hemibridge with ball and balloon exercise on forced expiratory volume. p<0.02 and p,0.007 respectively.

The third objective was to associate the pretest level of respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease with their selected demographic variables.

In experimental group, there was significant association found between the pretest respiratory rate and demographic variables and clinical variables in age (χ^2=29.4),gender (χ^2=29.4),body mass index (χ^2=25.2),family history of COPD (χ^2=20), history of smoking (χ^2=27.7), regular practices of exercise (χ^2=21.1).Whereas all other demographic variables such as age, gender, educational status, occupational status, area of work, comorbid illness were not associated . Hence, the hypothesis H_3 is retained for body mass index family history of COPD, history of smoking, regular practices of exercise and rejected for other variables in experimental group.

In experimental group, there was significant association found between the pretest level of dyspnea and demographic variables and clinical variables in gender (χ^2=24.9),family history of COPD (χ^2=11.3),history of smoking (χ^2=16.1) regular practices of exercise (χ^2=27.7). Whereas all other demographic variables such as age, educational status, occupational status, comorbid illness, BMI, area of work, family history of COPD, history of smoking were not associated . Hence, the hypothesis H_3 is retained for gender, regular practices of exercise and rejected for other variables in experimental group.

In experimental group, there was significant association found between the pretest lung capacity and demographic variables and clinical variables in age (χ=33.1), gender (χ=24.9), BMI (χ=31.6), family history of COPD (χ=31.7), history of smoking (χ=32.2), regular practices of exercise (χ=24.6). Whereas all other demographic variables such as educational status, occupational status, comorbid illness, area of work, were not associated . Hence, the hypothesis H_3 is retained for age, gender, BMI, family history of COPD, history of smoking, regular practices of exercise and rejected for other variables in experimental group.

Summary

This chapter deals with the discussion of the study with reference to the objective and supportive studies. All the three objective have been obtained and the hypotheses were proved

CHAPTER-VI

SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

This chapter comprises of the summary, conclusion, implications to nursing practice, nursing administration, nursing education, nursing research and recommendations for further study.

SUMMARY OF THE STUDY

A study was conducted to evaluate the effectiveness of balloon blowing exercise on respiratory status among patients with chronic obstructive pulmonary disease at Kongunadu hospital, Coimbatore. A quantitative evaluative approach with quasi experimental nonequivalent pretest posttest with control group design was used .A total of 60 samples were selected using nonprobability purposive sampling technique. A demographic proforma, observation technique, modified borg's dyspnea scale and 3 ball incentive spirometer was used to collect data based on the study objectives. Balloon blowing exercise includes blowing of commercially available balloon in 90/90 hemibridge with ball and balloon position for 10-15 minutes three times a day for 5 consecutive days .The collected data was analyzed using descriptive and inferential statistics. To test hypothesis, paired 't' test, independent t" test and chi square analysis were used.

FINDINGS OF THE STUDY

The major findings of the study were summarized as below

I. The demographic variables of the patients with COPD

- Highest percentage of samples11(36%) were belong to the age groups of 56-65 years in experimental group and control group 9(30%).

- Majority of samples were males26(86.6%) that in both experimental group and control group
- Similar percentage 7(23%) of samples were primary education and secondary education and in control group 4(13.3%).
- Majority of samples 11(36%) were unemployed and in control group 10(33%) were unemployed.
- Majority of samples 23(77%) were cotton industry worker in experimental group and in control group 4(13.3%).
- Majority of samples 15(50%) were less than 18 of BMI ,and in control group 11(36.6%).
- Majority of samples 15(50%) were having hereditary disease and in control group 12(40%).
- Majority of samples 28(93.4%%) were not having the family history of hereditary disease and in control group 29(96.6%) samples were not having history of COPD.
- Majority of samples 24(83.7%) were not having smoking habit and in control group 20(66.6%).
- Majority of samples 28(93.4%) were non regular practicers of exercise and27(90%) samples were in control group.

II. Assess the effectiveness of balloon blowing exercise on respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease in experimental group.

In experimental group, patients with COPD had 21.1±2 had respiratory rate in pretest and in post test had 18±2.4 respiratory rate, so the difference is 3.1, this difference is 12.5 and is statistically highly significant $p < 0.05$

In pretest, highest percentage 12(40%) of the samples had slight level of dyspnea whereas 9(30%) of the samples had moderate level of dyspnea 5(16%) had very slight level of dyspnea and least 4(13.3%) of the samples had somewhat severe level of dyspnea.

During posttest, most of the samples 11(36.67%) had very slight level of dyspnea, 7(23.3%) of samples had nothing at all, 6(20%) had very very slight level of dyspnea, 5(16%) samples had slight level of dyspnea and least of 1(3.3%) had moderate level of dyspnea and none (0%) had moderate and somewhat severe level of dyspnea in experimental group .

Majority of the samples 22(73.3%) in pretest had lung capacity of 600cc/minute, comparatively less samples 8(26.6%) had lung capacity of 900cc/minute and none (0%) had lung capacity of 1200 cc/minute.

During posttest, higher percentage of samples 24(80%) had 900cc/minute,6(20%) samples had 1200cc/m and none (0%) had 600cc/minute.

III. Associate the pretest level of respiratory rate, level of dyspnea and lung capacity among patients with Chronic obstructive pulmonary disease with their selected demographic variables

In experimental group, there was significant association found between the pretest respiratory rate and demographic variables and clinical variables in body mass index family history of COPD, history of smoking, regular practices of exercise. Whereas all other demographic variables such as age, gender, educational status, occupational status, comorbid illness were not associated. Hence, the hypothesis H_3 is retained for body mass index family history of COPD, history of smoking, regular practices of exercise and rejected for other variables in experimental group.

In experimental group, there was significant association found between the pretest level of dyspnea and demographic variables and clinical variables in gender, regular practices of exercise. Whereas all other demographic variables such as age, educational status, occupational status, comorbid illness, BMI, area of work, family history of COPD, history of smoking were not associated. Hence, the hypothesis H_3 is retained for gender, regular practices of exercise and rejected for other variables in experimental group.

In experimental group, there was significant association found between the pretest lung capacity and demographic variables and clinical variables in age, gender, BMI, family history of COPD, history of smoking, regular practices of

exercise. Whereas all other demographic variables such as educational status, occupational status, comorbid illness, area of work, were not associated. Hence, the hypothesis H_3 is retained for age, gender, BMI, family history of COPD, history of smoking, regular practices of exercise and rejected for other variables in experimental group.

CONCLUSION

The study was conducted to evaluate the effectiveness of balloon blowing exercise on respiratory status among patients with chronic obstructive pulmonary disease in Kongunad Hospital at Coimbatore. The result of the study showed that patients with COPD had 21.1±2 had respiratory rate in pretest and in post test had 18±2.4 respiratory rate, this difference is 12.5 and is statistically highly significant p <0.05. Patients with COPD 2.4±0.7 had level of dyspnea and in posttest had 1.5±0.5 level of dyspnea, this difference is0.9,so the difference is 6.7 and it is statistically significantP<0.05. In experimental group, patients with COPD had 0.7±0.2 had lung capacity and in posttest 1.32±0.7 had lung capacity, this difference is 0.6 and the difference is 8.7which is highly significantP<0.05.hence, thebaloon blowing exercise was effective in improving the respiratory status of patients with COPD. There was significant association found between respiratory rate and in body mass index family history of COPD, history of smoking, regular practices of exercise. There was significant association found between level of dyspnea and gender, regular practices of exercise. There was significant association found between lung capacity age, gender, BMI, family history of COPD, history of smoking, regular practices of exercise, in experimental group.

IMPLICATIONS

The findings of the study has the following implications in the various areas of Nursing service, Nursing education, Nursing administration and Nursing research.

Nursing practice

- The nurse can understand the importance of balloon blowing exercise in nursing practice to improve the respiratory status among the patients with COPD in early stages.
- The nurse can implement these techniques in various settings.

Nursing Education

- The nurse educator can include the concepts of balloon blowing exercise on respiratory status in teaching learning activities.
- Nursing curriculum needs to be updated to identify the aspects of nursing care that are lacking to provide supportive education to improve the respiratory status.
- The nurse educator should provide teaching regarding this 90/90 hemibridge with ball and balloon blowing exercise to bring out innovative and creative ideas to improve the respiratory status among patients with COPD.

Nursing Administration

- Nursing administrators can organize for training programme about 90/90hemibridge with ball and balloon position to improve the respiratory paramaters and postural roles.

Nursing Research

- More research can be done in the field of medicine using 90/90 hemibridge with ball and balloon blowing position.
- Disseminate the findings of research through conferences, seminars and publication in professional, national and international journals.
- The generalization of study result can be made by further replication of the study.

- There is need for an extensive research in this area regarding implementation of this exercise and promotion of respiratory status and improving the quality of life.

RECOMMENDATIONS

- A similar study can be conducted with large number of samples to generalize the study findings.
- A similar study can be conducted among women with chronic low back pain, knee pains.
- A similar study can be done in various settings to evaluate the effectiveness of balloon blowing exercise on lower respiratory infection, asthma and postural abnormalities.
- A comparative study can be done to evaluate the effectiveness of balloon blowing exercise and incentive spirometry in improving the lung capacity.
- A true experimental study can be done to evaluate the effectiveness of 90/90 hemibridge with ball and balloon blowing position.

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- **Pubmed.com**

ANNEXURE-A

LETTER SEEKING PERMISSION TO CONDUCT THE STUDY

From

Ms.Hepcy Freeda Josphine. R
Final year MSc.(N)
Kongunadu College of Nursing
Coimbatore-30.

To

The Managing director
Kongunadu Hospital
Coimbatore-12.

Respected sir,

Subject: Letter Seeking Permission To Conduct The Study.

This is to kindly inform you that for our research project purpose, I am the final year M.Sc.(N) Student wish to do a research project on A Study to evaluate the effectiveness of balloon blowing exercise on respiratory status among patients with Chronic obstructive pulmonary disease at a selectedhospital,Coimbatore. I request you to grant mepermission to conduct my research project as per the university requirement in our Kongunadu Hospital Pvt. Ltd., Coimbatore.

Thanking you,

Place: Coimbatore. Yours faithfully,

Date: Ms.Hepcy Freeda Josphine.R)

Dr. P. RAJU, M.S.,
Managing Director
Regd. No : 26678
Kongunad Hospital (P) Limited
116 117, 11th Street, Tatabad,
Coimbatore - 641 012.

ANNEXURE-B

LETTER GRANTINGPERMISSION TO CONDUCT THE STUDY

From

Ms.Hepcy Freeda Josphine. R
Final Year M.Sc. (N)
Kongunadu College of Nursing
Coimbatore-30.

To

The Managing director
Kongunadu Hospital
Coimbatore-12.

Respected Sir,

Subject:Permission to Conduct the Study in Kongunadu Hospital.

This is to certify that Ms.Hepcy Freeda Josphine R., Final year M.Sc. Nursing student of Kongunadu College of Nursing is Conducting a Research Project in the Partial Fulfillment of the TamilnaduDr.MGR Medical University Chennai Part of the Requirementfor the Award of Degree of Master of Science inNursing.

TOPIC: **A Study to Evaluate the Effectiveness Of Ballon Blowing Exercise on Respiratory Status among Chronic obstructive pulmonary disease Patients at a selectedhospital,Coimbatore.**

I grant permission to conduct the study in Kongunadu Hospital.

Place:

Date:

Dr. P. RAJU, M.S.,
Managing Director
Regd. No : 26678
Kongunad Hospital (P) Limited
116 117, 11th Street, Tatabad,
Coimbatore - 641 012.

ANNEXURE-C

REQUISITIONLETTERTO VALIDATETHERESEARCH TOOL ANDCONTENT

From

Ms.HepcyFreedaJosphine.R
Final yearMSc(N)
Kongunadu college of nursing
Coimbatore-30.
To

The Managing director
Kongunadu Hospital
Coimbatore-12.

Respected Sir/Madam,

Subject: requesting permission to validate the tool and content.

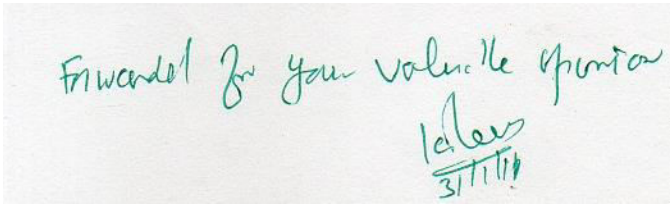
Iam Ms. Hepcy Freeda Josphine. R,doing my final year M.Sc. Nursing in Kongunadu College of Nursing, Coimbatore as a part of my M.Sc. Nursing programme, I have undertaken the following study formy research"**A SUDY TO EVALUATE THEEFFECTIVENESS OF BALLOON BLOWING EXERCISE ON RESPIRATORY STATUS AMONG PATIENTS WITH CHRONIC OBSTRUCTIVEPULMONARY DISEASE AT ASELECTED HOSPITAL,COIMBATORE**."The following tool is indented to be used ,hence I request you to kindly giveme avaluable suggestion and necessary modification for the continuing the study.

Thankingyou,

Enclosed- Certificate of Validation.

Tool for data collection English and Tamil

Balloon blowing exercise



Place:

Date:

ANNEXURE-D

LIST OF EXPERTS

1. **Dr.Keerthivasan ,MBBS,M.D**
   Consultant Pulmonologist,
   KongunaduHospital,
   Coimbatore.

2. **Mrs.A.Shanthipriya MSc(N)**
   H.O.D Medical Surgical Department,
   K.G College of Nursing,
   Coimbatore.

3. **Dr. Shyla Isaac**
   Principal
   SreeAbiramiCollege of Nursing,
   Coimbatore.

4. **Prof .Dr.AkilaPh.D**
   KMCH COLLEGE OF Nursing
   Coimbatore.

5. **Mrs. Uma Maheshwari**
   Associate Professor
   PPG College of Nursing
   Coimbatore.

ANNEXURE-E

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by Ms.Hepcy Freeda Josphine. R,final year M.Sc Nursing in Kongunadu college of nursing at Coimbatore(affiliated to The Tamil Nadu Dr.M.G.R. Medical University) is validated and can proceed with this tool and content for the main study entitled **"A STUDY TOEVALUATE THE EFFECTIVESS OF BALLON BLOWING EXERCISEON RESPIRATORY STATUSAMONG PATIENTS WITH CHRONICOBSTRUCTIVE PULMONARY DISEASE AT ASELECTED HOSPITAL, COIMBATORE."**

Signature of the validator

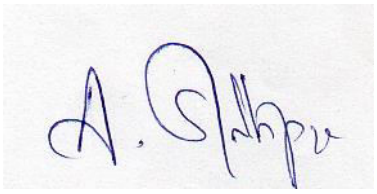
Name:

Designation:

Date:

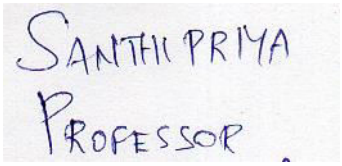
CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by Ms.Hepcy Freeda Josphine. R ,final year M.Sc Nursing in Kongunadu college of nursing at Coimbatore (affliated to The TamilNadu Dr.M.G.R. Medical university) is validated and can proceed with this tool and content for the main study entitled **"A STUDY TOEVALUATE THE EFFECTIVESS OF BALLON BLOWING EXERCISEON RESPIRATORY STATUSAMONG PATIENTS WITH CHRONICOBSTRUCTIVE PULMONARY DISEASE AT ASELECTED HOSPITAL, COIMBATORE."**



Signature of the validator:

Name:



Designation:

Date:

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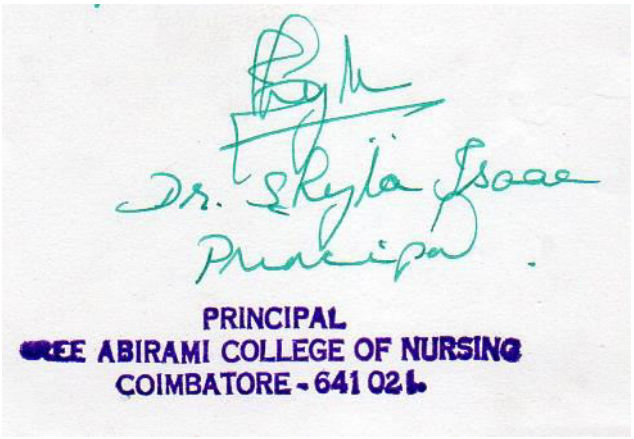
This is to certify that the tool and content developed by Ms.HepcyFreedaJosphine.R ,final year M.Sc Nursing in Kongunadu college of nursing at Coimbatore(affliated to The TamilNadu Dr.M.G.R. Medical university) is validated and can proceed with this tool and content for the main study entitled **"A STUDY TOEVALUATE THE EFFECTIVESS OF BALLON BLOWING EXERCISEON RESPIRATORY STATUSAMONG PATIENTS WITH CHRONICOBSTRUCTIVE PULMONARY DISEASE AT ASELECTED HOSPITAL, COIMBATORE."**



Signature of the validator

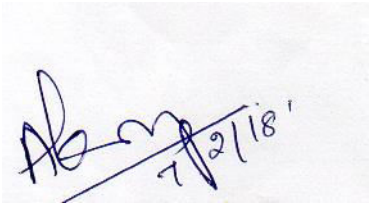
Name:

Designation:

Date:

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by Ms.HepcyFreedaJosphine.R ,final year M.Sc Nursing in Kongunadu college of nursing at Coimbatore(affliated to The TamilNaduDr.M.G.R. Medical university) is validated and can proceed with this tool and content for the main study entitled **"A STUDY TOEVALUATE THE EFFECTIVESS OF BALLON BLOWING EXERCISEON RESPIRATORY STATUSAMONG PATIENTS WITH CHRONICOBSTRUCTIVE PULMONARY DISEASE AT ASELECTED HOSPITAL, COIMBATORE."**



Signature of the validator

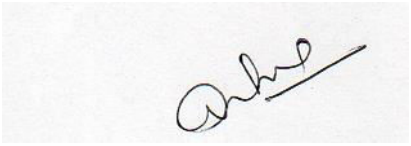
Name: P. AKILA

Designa : PROFESSOR

Date: : 7/2/2018.

CERTIFICATE OF VALIDATION

This is to certify that the tool and content developed by Ms.HepcyFreedaJosphine.R ,final year M.Sc Nursing in Kongunadu college of nursing at Coimbatore(affliated to The TamilNadu Dr.M.G.R. Medical university) is validated and can proceed with this tool and content for the main study entitled **"A STUDY TOEVALUATE THE EFFECTIVESS OF BALLON BLOWING EXERCISEON RESPIRATORY STATUSAMONG PATIENTS WITH CHRONICOBSTRUCTIVE PULMONARY DISEASE AT ASELECTED HOSPITAL, COIMBATORE."**



Signature of the validator

Name: UMAMAHESWARI

Designation: ASSOCIATE PROFESSOR

Date:

ANNEXURE-F

SECTION-A

TOOL FOR DATA COLLECTION

Fill or tick appropriately

1. Age in years[✓]

   a]46-55 .

   b]56-65.

   c] 66-75.

2. Gender[✓]

   a] Female

   b] Male

3. Educationalstatus[✓]

   a]Illiterate

   b] Primaryeducation

   c] Secondary education

   d] Graduate

   e] Post graduate

4. Occupational status[✓]

   a] Unemployed

   b]Self employee

c] private employee

d]Government employee

5. Area of work[✓]

a]Cottonindustry

b] Chemical industry

c] Mining industry

d] others

6. BMI[✓]

a]<18

b]19-21

c] 22-25

d]>25

7. Comorbid illness[✓]

a]Anemia

b] Hereditary diseases

c] None.

8.] Family history of COPD.[✓]

a] Yes

b] No

9]. Smoking habit[✓]

a]Yes

b] No

10] Regular practice of exercise[✓]

a] Yes

b] No

Modified Borg's dyspnea scale

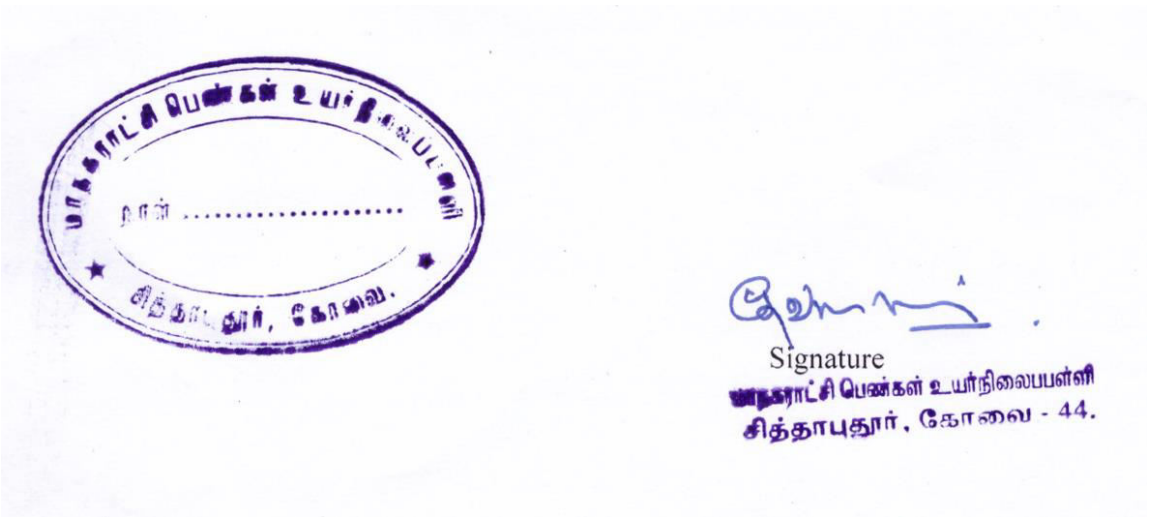
DYSPNEA	SCORE
Nothing at all	0
Very Very Slight dyspnea	0.5
VerySlight	1
Slight dyspnea	2
Moderate	4
Somewhat severe	5
Severe	6,7
Very severe	8,9
Veryvery severe	9
Maximal	10

ANNEXURE-G

CERTIFICATE OF EDITTING

TOWHOMSOEVER IT MAY CONCERN

Certify that the dissertation paper titled"A Study to evaluate the effectivenessof balloon blowing exercise on respiratory statusof patients with chronic obstructive pulmonary disease at a selected hospital, Coimbatore".By Ms.HepcyFreedaJosphine.R .It has been checked for accuracy and correctness of English language used in presenting the paper is lucid, unambiguous free of grammatical or spelling errors and apt for the purpose



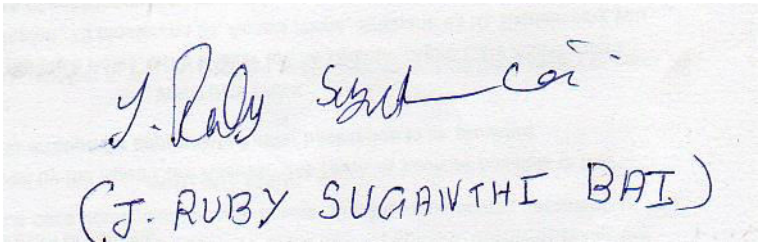
Signature

ANNEXURE-G

CERTIFICATE OF EDITTING

TO WHOMSOEVER IT MAY CONCERN

Certify that the dissertation paper titled "A Study to evaluate the effectiveness of balloon blowing exercise on respiratory status of patients with chronic obstructive pulmonary disease at a selected hospital, Coimbatore". By Ms.HepcyFreedaJosphine.R .It has been checked for accuracy and correctness of Tamil language used in presenting the paper is lucid, unambiguous free of grammatical or spelling errors and apt for the purpose



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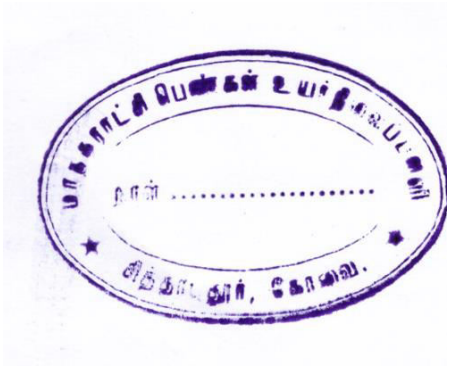

ANNEXURE-H

BALLOON BLOWING EXERCISE

Introduction

Balloon exercises double as controlled breathing exercises. The deep inhalation and exhalation will enhance the way ofbreathe as the diaphragm becomes stronger. This will push up more air into the lungs and therefore, increase lung capacity. Smokers with poor respiratory muscles can benefit from balloon blowingexercise. As those muscles respiratory strengthen, it will improve theposture and relieve back pain.

Benefits Of Balloon Exercise

- Improvesbreathing
- Increases lung capacity
- Improves thestability posture.
- Relieves pain.
- Increases the quality of life.

Mechanism of90/90Hemibridge with Ball andBalloon blowing exercise

- ❖ By facilitating on the spinal flexors whichinhibits the spine extensors
- ❖ Byfacilitating depression of ribs and not allowing the lumbar spine to become excessively lordotic .
- ❖ Resisted exhalation increases the abdominal pressure.
- ❖ It slows down the process of exhalation phase of respiration which is helpful in decreasing the shortness ofbreath.

Steps ofballoon blowing exercise

Step-1 Lie on your back with your feet flat on a wall and knees and hips bent at a 90-degree angle.

Step -2 Place a 4-6 inch ball between your knees

Step-3 Place your right arm above your head and a balloon in your left hand.

Step-4 Inhale through your nose and as you exhale through your mouth, perform a pelvic tilt so that your tailbone is raised slightly off the mat.

Step-5 Do not press your feet on the wall, instead pull down with your heels

Step-6 You should feel the back of your thighs and inner thighs engage, keeping pressure on the ball

Step-7 Now, inhale through your nose and slowly, blow out into the balloon.

Step-8 Pause three seconds with your tongue on the roof of your mouth to prevent airflow out of the mouth.

Step-9 Without pinching the neck of the balloon and keeping your tongue on theroof of your mouth, inhale again through your nose.

Step-10 Slowly ,stabilize the balloon with your left hand.

Step-11 Do not strain your neck and cheeksasyou blow out .

Step-12 After the fourth breath in, pinch the balloon neck and remove it from yourmouth,let the air out of the balloon.

Step13 Relax and repeat for 10-15 minutes.

Conclusion

90/90hemibridge with ball and balloon exercise Balloon blowing exercise activates the diaphragm and transversus abdominal muscles to work efficiently.This willlead to healthy respiration.

ANNEXURE-I

INVESTIGATOR IMPLEMNTING BALLOON BLOWING EXERCISE.


M-8