



EFFECTIVENESS OF DIAPHRAGMATIC BREATHING EXERCISE ON SELECTED BIOPHYSICAL PARAMETERS AMONG PATIENTS WITH COPD.

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ABSTRACT

Breathing is the process by which oxygen in the air is brought into the lungs and into close contact with the blood, which absorbs it and carries it to all parts of the body. Chronic Obstructive Pulmonary Disease makes hard to breathe. The present study was aim to assess the effectiveness of diaphragmatic breathing exercise on selected biophysical parameters among patients with chronic obstructive pulmonary disease. The objectives of the study is to assess the effectiveness of diaphragmatic breathing exercise in relieving dyspnea among COPD patients. The conceptual frame work of this study was based on Orlando theory of deliberative nursing model. The research design used for the study was a quasi-experimental design with factorial design was selected. The total of 30 COPD patients who met the inclusion criteria are selected as a study participants, out of which 15 were in experimental group. Pre-test score were obtained from each group using modified BORG scale, RDOS and peak flow rate. After giving intervention post test score also obtained with modified BORG scale, RDOS and peak flow rate. Measure of paired t show that the intervention is significant ($p < 0.01$). This study concluded that the diaphragmatic breathing exercise is effective on selected biophysical parameters among COPD patients.

KEYWORDS :

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a major public health problem worldwide. It is the fourth leading cause of chronic morbidity and mortality in the world, and is projected to rank seventh in burden of disease worldwide by 2020.

The global initiative for chronic obstructive lung disease has defined COPD as "a preventable and treatable disease with some significant extra pulmonary effects that may contribute to severity in individual patients".

COPD is a lung disease caused by one or more health problems and includes chronic bronchitis and emphysema. Over time, this disease makes it hard to breathe. It is a very serious disease and right now the third leading cause of death in the United States. The good news is that COPD is often preventable and treatable.

NEED AND SIGNIFICANCE FOR THE STUDY

Chronic obstructive pulmonary disease (COPD) affects 210 million people. Chronic obstructive pulmonary disease was the fifth cause of death in 2002 and it is projected to be the fourth cause of mortality by 2030. Tobacco smoking is the major risk factor, but the use of solid fuels for cooking and heating also responsible for major risks. Strategies to reduce exposure to major risk factors are likely to have an impact on morbidity and mortality.

Increasing prevalence of COPD will result in spike of mortality rates in the coming years. The WHO data places the prevalence of COPD at 0.8%. The estimated range is from 0.04% in female subjects aged 15 to 44 years to 3.51% in man over 60 years.

COPD prevalence, morbidity and mortality vary across countries and across different groups within countries but are generally directly related to the prevalence of tobacco smoking and occupational toxins. The increase in numbers of smokers, increasing pollution and rising longevity are the major causes for the rapid increase of this disease. The numbers of smokers in developed countries are declining due to the increased awareness about ill effects of smoking, but the numbers are increasing in developing countries. This result in increase in mortality and morbidity due to COPD in developing countries.

In India a study collecting data without spirometer

assessment suggested that 12 million people were affected by COPD 23. Prevalence of respiratory symptoms in 6%–7% of non-smokers and up to 14% of smokers. In a recent study in southern India, the prevalence rate of COPD in adults was around 7%.

Diaphragmatic breathing is accepted as a therapy for COPD only to a minimal extent. When comparing to other medications if diaphragmatic breathing has effectiveness of reducing dyspnea it can be of great use in the clinical field and the patients will benefit from it to a great extent.

OBJECTIVES

To assess the effectiveness of diaphragmatic breathing exercise in relieving dyspnoea among COPD patients.

HYPOTHESIS

H1: There will be a significant difference on selected biophysical parameters among COPD clients after giving diaphragmatic breathing exercise.

CONCEPTUAL FRAME WORK

Conceptual framework is based on Orlando's theory of Deliberative Nursing Process.

MATERIALS AND METHODS RESEARCH APPROACH

Quantitative evaluative approach was used

RESEARCH DESIGN

The research design used for the present study was a quasi-experimental design where factorial design was selected to evaluate the effectiveness of diaphragmatic breathing exercise on selected biophysical parameters among patients with COPD.

VARIABLES

Independent variable - Diaphragmatic breathing exercise.

Dependent variable - Selected biophysical parameters in relieving dyspnoea among COPD patients.

SETTING OF THE STUDY

NIMS hospital, Neyyattinkkara.

POPULATION

The population for the present study were COPD patients.

SAMPLE

Patients who are admitted with COPD manifesting dyspnoea in NIMS Hospital Neyyattinkara.

SAMPLE SIZE

The sample size of the study was 30 COPD patients .

SAMPLING TECHNIQUE

Purposive sampling technique

CRITERIA FOR SAMPLE SELECTION

The samples were selected based on the following inclusion and exclusion criteria

INCLUSION CRITERIA

COPD Clients:

- Manifesting dyspnea of > 5 score in the modified BORG scale.
- Above 40years of age..
- Both male and female.
- Able to communicate in English or Malayalam.
- Willing to participate.

EXCLUSION CRITERIA

COPD Clients:

- Having exacerbations of dyspnea who needs immediate pharmacological interventions.
- On continuous Oxygen therapy.
- Administered medicated nebulization within the previous 2 hours.

TOOLS & TECHNIQUE

The tool used in the study consisted of three parts

Part I - Socio-demographic data of the clients.

Part II - Clinical data of the clients.

Part III -. Modified BORG scale, RDOS and Peak flow rate.

Description of the tool

The tools used in the study were:-

Part I – Socio-demographic data of the clients includes sex, age, residence, education , occupation and risk factors of the clients.

Part II – Clinical data of the clients includes years since diagnoses of COPD, treatment for COPD, associated illnesses and smoking history.

Part III- Section 1 – modified BORG scale to assess dyspnea. Borg Scale, a 10 point scale where the client subjectively scores his breathing difficulty before and after administration of steam inhalation and diaphragmatic breathing exercise. BORG scale is a very widely used instrument for assessing the respiratory effort experienced by the patient.

Section 2 –Respiratory distress observation scale to assess the respiratory distress. Treatment of dyspnea must be guided by assessment but no other tool exists to quantify respiratory distress when the patient cannot self-report dyspnea putting the patient at risk for overtreatment or under treatment. Symptom self-reports has been held as the most reliable means for evaluating the patient's experience, disease progression and response to treatment.

Section 3 – peak expiratory flow rate using peak flow meter.

DATA COLLECTION PROCEDURE

Data was collected for a period of six weeks . Clients admitted in medical wards of NIMS Hospital, Neyyattinkara with dyspnoea associated with COPD were identified from the admission list of the hospital. The admitted clients were selected using purposive sampling technique: Those patients fulfilling the eligibility criteria were selected as the samples for the study.

The main study was conducted on 30 samples .The samples selected for the study were informed to their consulting physician and prescription order for administering diaphragmatic breathing was obtained. On the first day informed consent from the study subjects or relatives were obtained, socio demographic data as well as clinical data were collected and an introduction about the study was given by the investigator to the clients.

Pre-test score was obtained using the structured tool respiratory parameters of the clients before administration of diaphragmatic breathing was assessed (Pre-test). The intervention was given continuously for 20 minute in morning and evening for 5 days .The post test score were obtained on fifth day evening session of the intervention pre-test and post test score were compared for the effectiveness of diaphragmatic breathing exercise.

RESULTS AND DISCUSSION

The results of the present study were presented under the following sections:

Section 1 : Description of the socio demographic and clinical variable characteristics

Section 2: Description of dyspnea based on BORG scale

Section 3: Description of respiratory distress based on RDOS

Section 4: Description of PEFr on peak flow meter

Section 1 :Description of the socio demographic and clinical variable characteristics.

- Among the samples 10% belongs to the age group of 40-49,26.66% belongs to the age group of 50-59,46.66% belongs to the age group of 60-69 and 16.6% belongs to the age group of 70 years and above.
- Among the samples 50% are male and 50 % are female.
- Among the samples 26.66% lives in urban community and 73.34%lives in rural community.
- Among the samples 3.33% are illiterate, 40% have primary education,26.67% have high school education ,26.67% have college level education , and 3.33 % are professionals.
- Among the samples 43.33% were unemployed, 20% were coolie, 3.33% were farmers 16.67% were government employee and 16.67% were private employee.
- Among the samples 30% exposed risk factors of solid fuels used for cooking,36.67% exposed to occupational dusts,3.33% exposed to chemicals,3.33% exposed to vapours, 23.34% exposed to fumes ,3.33% exposed to frequent lower respiratory tract infection during childhood.
- Among the samples 16.68% are recently diagnosed as COPD ,33.33% on 2.1-04 years,33.33% on 4.1 - 6 years ,10% on 6.1-8 years,3.33% on 8.1 -10 years ,3.33 % above 10 years.
- Among the samples 33.33% are taking regular treatment and 66.67% are taking irregular treatment.
- Among the samples 6.67% have hypertension, 13.33% have diabetes mellitus, 3.33% have cardiovascular disease,33.33 % have both hypertension and diabetes mellitus and hypertension ,6.67% have both hypertension and cardiovascular disease,3.33% have both diabetes mellitus and cardiovascular disease,13.34% have hypertension ,diabetes mellitus and cardiovascular disease and 20% have no disease.
- Among the samples 3.33% are taking medication of oral bronchodilators,3.3% taking injectable bronchodilator. 6.67% taking inhaled bronchodilator, 26.67% takes both oral and injectable bronchodilator,6.67 % takes both oral and inhaled bronchodilator,20% take both injectable and inhaled bronchodilator and 33.33% take all 1,2 and 3.
- Among the samples 60% are non-smokers ,20 % had stopped smoking less than 5 years,13.33 % had stopped smoking less than 5-10 years,6.67 % had smoking more than 10 years .

Section 2 : Description of dyspnea based on BORG scale

Among the samples before administration of diaphragmatic breathing exercise 43.3% have moderate and 57.6% have severe dyspnea and after administration of diaphragmatic breathing 80% have moderate and 6.7% have severe dyspnea 13.3% have no dyspnea.

Effectiveness of interventions on dyspnea. Mean ,standard deviation and t value of level of dyspnea before and after the interventions.

**:- Significant at 0.01 level

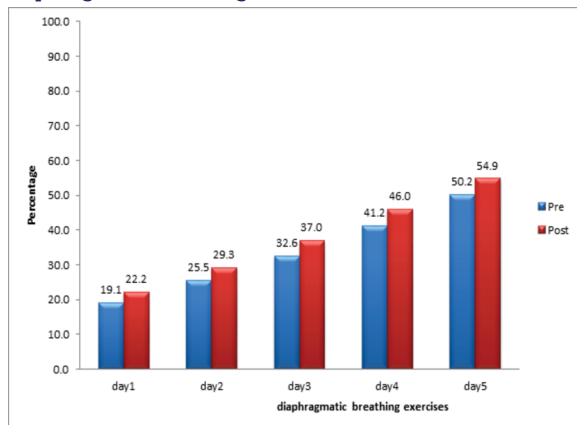
Group	stage	mean	SD	N	Mean Difference	Paired t	p
Diaphragmatic Breathing	pre	8.1	1.6	30			
	post	1.7	1.2	30	6.4	29.83	0.000

Effectiveness of intervention on respiratory distress

Respiratory distress		Diaphragmatic breathing	
		f	%
Pre	Mild	2	6.67
	Moderate	15	50.0
	Severe	13	43.33
post	Mild	25	83.33
	Moderate	5	16.67
	Severe	0	0.00

Effectiveness of intervention on peak flow rate

Effectiveness of intervention on Peak flow rate in Diaphragmatic breathing



**:- Significant at 0.01 level

Figure shows that the mean value of diaphragmatic breathing on day 1 is 19.1 and day 5 is 54.9 and there is a significant difference from day 1 to day 5 .

CONCLUSION

This chapter deals with the analysis and interpretation of the data's with both descriptive and inferential statistics .The computed accepted the research hypothesis H 1 = "There will be a significant difference on selected biophysical parameters among COPD clients after giving diaphragmatic breathing exercise .

DISCUSSION

The effectiveness of diaphragmatic breathing exercise in relieving dyspnea was assessed by using Borg scale, respiratory distress observation scale and the peak expiratory flow rate using peak flow meter before and after administering diaphragmatic breathing exercise.

In BORG scale in the experimental group the mean pre test score is significantly higher than the mean post test score (p < 0.05). Hence it is evident that there is significant decrease in the level of dyspnea after implementing diaphragmatic breathing exercises.

In respiratory distress observation scale the mean pre test score is significantly higher than the mean post test score (p < 0.05). Hence it is evident that there is significant decrease in the level of respiratory distress after implementing diaphragmatic breathing exercises

In peak flow rate the mean value on day 1 is 19.1 and day 5 is 54.9 and there is a significant difference from day 1 to day 5 . This indicates that there is effect on diaphragmatic breathing exercise in relieving dyspnea among COPD patients.

CONCLUSION

It meets the objectives of the study and the findings accept the hypothesis "There will be a significant difference on selected biophysical parameters among COPD clients after giving diaphragmatic breathing exercise'.

DISCUSSION

This study was attempt to assess the effectiveness of diaphragmatic breathing exercise on selected biophysical parameters among patients with COPD admitted in NIMS hospital ,Neyyattinkara.

Nursing implications

The present study has got implications in the field of nursing service, nursing administration, nursing education and nursing research.

Nursing practice

1. Diaphragmatic breathing exercise is a simple but effective treatment for dyspnea associated with COPD, nurses working in medical units can diaphragmatic breathing exercise for treating the same.
2. In patients who are showing habituation to broncho dilators, diaphragmatic breathing exercise can be used as a placebo and the habituation can be reversed without aggravation of dyspnea.
3. Patients can easily tolerate diaphragmatic breathing exercise, though it can be administered to all COPD patients.

Nursing Research

1. Study will be the valuable reference and pathway for further researchers.
2. The study can be replicated in large samples and initiating time series design for a longer period.

Nursing Education

1. The results of the study can be used as illustration to students by their nursing teachers.
2. It helps nursing students to plan and organize the nursing intervention clients with COPD presenting dyspnea.

Nursing administration

1. Diaphragmatic breathing is cost effective and reliable.
2. Nurse administrators should take leadership roles and motivate nursing personals to include diaphragmatic breathing exercise as a routine regimen in treating COPD.
3. The effectiveness of diaphragmatic breathing exercise can be informed to physicians and it can be added as a regimen in treating COPD and policies can be modified.

Recommendations

1. A similar study may be repeated for more generalization of finding.
2. A similar study can be done on large sample.
3. Study can be repeated in different setting to strengthen the finding.
4. A longer period of intervention can be studied for more reliability effectiveness.

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