



A STUDY TO COMPARE THE EFFECTIVENESS OF STEAM INHALATION WITH DIAPHRAGMATIC BREATHING EXERCISE ON SELECTED BIOPHYSICAL PARAMETERS AMONG PATIENTS WITH COPD ADMITTED IN NIMS HOSPITAL, NEYYATTINKARA.

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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 compare the effectiveness of steam inhalation with diaphragmatic breathing exercise on selected biophysical parameters among patients with chronic obstructive pulmonary disease. The objectives of the study are :To assess the effectiveness of steam inhalation in relieving dyspnoea among COPD patients, To assess the effectiveness of diaphragmatic breathing exercise in relieving dyspnoea among COPD patients, To compare the effect of steam inhalation and diaphragmatic breathing exercise on selected biophysical parameters in relieving dyspnoea of patients with COPD. 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 60 COPD patients who met the inclusion criteria are selected as a study participants, out of which 30 were in experimental group 1 (steam inhalation) and 30 in experimental group 2 (diaphragmatic breathing exercise). 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 from each group with modified BORG scale ,RDOS and peak flow rate. Measure of paired t show that the both the interventions are significant ($p < 0.01$). This study concluded that both the steam inhalation and diaphragmatic breathing exercise are equally effective on selected biophysical parameters among COPD patients.

KEYWORDS :

INTRODUCTION

Breathing is one of the vital function of the body which is influenced by several activities of each and every cells in the body. A human being breathes about 16 times/minute and 21,600 times per day . The respiratory system enables us to produce energy by supplying the body with a continuous supply of oxygen which is responsible for elimination of carbon dioxide which is necessary for plant respiration and oxygen for human respiration. There are various disorders in respiratory system which are reversible or irreversible . COPD is characterized by limitation of airflow - both in and out of the lungs - that is irreversible. This means less air flows in and out of lungs because of one or more of the following factors. The air tubes and alveoli lose their elasticity and are unable to stretch when breath. In such case the walls that lie between the alveoli get destroyed. The lining of the air tubes becomes thick and inflamed. The air tubes secrete more mucus than they should, causing them to clog . 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

OBJECTIVES

- To assess the effectiveness of steam inhalation in relieving dyspnoea among COPD patients.
- To assess the effectiveness of diaphragmatic breathing exercise in relieving dyspnoea among COPD patients.
- To compare the effect of steam inhalation and diaphragmatic breathing exercise on selected biophysical parameters in relieving dyspnoea of patients with COPD.

Hypotheses

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

H2: There will be significant difference in diaphragmatic breathing exercise than steam inhalation on relieving dyspnoea among COPD patients.

Quantitative evaluative approach was used. The research design used for the present study was a quasi-experimental

design where factorial design was selected to evaluate the effectiveness of steam inhalation versus diaphragmatic breathing exercise on selected biophysical parameters among patients with COPD. Independent variables- Steam inhalation & diaphragmatic breathing exercise. Dependent variable -Selected biophysical parameters in relieving dyspnoea among COPD patients. Setting of the study is NIMS hospital , Neyyattinkara. The population for the present study were COPD patients. Purposive sampling technique is used .The tool used in the study consisted of three parts

- Part I – Socio-demographic data
- 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.
- Section 2 –Respiratory distress observation scale to assess the respiratory distress.
- Section 3 – peak expiratory flow rate using peak flow meter.

RESULTS AND DISCUSSION

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

In steam inhalation group (experimental group 1) 3.33% belongs to the age group of 40-49, 33.33% belongs to the age group of 50-59, 43.34% belongs to the age group of 60-69 and 20% belongs to the age group of 70 years and above. In diaphragmatic breathing exercise group (experimental group 2) 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. 66.67% are male and 33.33% are female in steam inhalation group and 50% are male and 50% are female in diaphragmatic breathing exercise group. 16.67% lives in urban community and 83.33% lives in rural community in steam inhalation group and in diaphragmatic breathing 26.66% lives in urban community and 73.34% lives in rural community. 3.33% are illiterate, 20% have primary education, 50% have high school education ,23.33% have college level education , and 3.34% are professionals in steam inhalation group. 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 in diaphragmatic breathing exercise group. In steam inhalation group 26.67% were unemployed, 30% were coolie, 13.33% were farmers, 13.33% were government employee and 16.67% were private employees. In diaphragmatic breathing exercise group 43.33% were un employed, 20% were coolie, 3.33% were farmers 16.67% were government employee and 16.67% were private employee.

In steam inhalation 30% are exposed to the risk factors of solid fuels used for cooking,43.34% exposed to occupational dust,16.67% exposed to chemicals,3.33% exposed to vapours,3.33% exposed to irritants,3.33% exposed to fumes. In diaphragmatic breathing exercise group 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 child hood.

In steam inhalation 3.33% are recently diagnosed as COPD ,40% on 2.1-04 years,36.67 % within 4.1 - 6 years,10% on 6.1-8 years,10% on 8.1 -10 years.In diaphragmatic breathing exercise 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.

40% are taking regular treatment and 60% are taking irregular treatment in steam inhalation group,33.33% are taking regular treatment and 66.67% are taking irregular treatment in Diaphragmatic breathing group.

3.33% have hypertension, 40 % have both hypertension and diabetes mellitus and hypertension ,10% have both hypertension and cardiovascular disease,6.67% have both diabetes mellitus and cardiovascular disease,20% have hypertension ,diabetes mellitus and cardiovascular disease and 20% have no disease in steam inhalation group. In diaphragmatic breathing exercise group6.67% 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 65 hypertension ,diabetes mellitus and cardiovascular disease and 20% have no disease in steam inhalation group.

6.67% are taking medication of oral bronchodilators,6.67% taking injectable bronchodilator.16.66% taking inhaled bronchodilator,33.33% takes both oral and injectable bronchodilator,20 % takes both oral and inhaled bronchodilator,10% take both injectable and inhaled bronchodilator and 6.67% take all 1,2 and 3 in steam inhalation group. In diaphragmatic breathing group 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.

46.67% are non-smokers ,26.67 % had stopped smoking less than 5 years,23.33 % had stopped smoking less than 5-10 years,3.33 % had smoking more than 10 years in steam inhalation group and 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 in diaphragmatic breathing exercise group.

Section 2 : Description of dyspnea based on BORG scale

Among the samples before administration of steam inhalation and diaphragmatic breathing exercise 56.7% have moderate dyspnea and 43.3%have severe dyspnea in steam inhalation(experimental group 1) and 43.3% have moderate

and 57.6%have severe dyspnea in diaphragmatic breathing (experimental group 2). And after administration of steam inhalation and diaphragmatic breathing exercise 63.3% have mild dyspnea and 36.7% have moderate dyspnea in steam inhalation(experimental 66 group 1) and 80% have moderate and 6.7%have severe dyspnea 13.3% have no dyspnea in diaphragmatic breathing (experimental group 2).

Section 3 : Description of respiratory distress based on RDOS

Effectiveness of respiratory distress is categorized in to mild, severe and moderate in it steam inhalation group has scored 3.33% mild,63.34%moderate and 33.33% severe in pretest and in posttest 86.67% mild ,13.33% moderate and no severe .In diaphragmatic breathing exercise the pretest scores are 6.67% mild 50.0% moderate and 43.33% severe. In posttest 83.33% mild ,16.67% moderate and no severe.

Section 4: Description of PEFR on peak flow meter

In steam inhalation group the mean value on day 1 is 25.7 and the day 5 is 64.3 and there is a significant difference from day 1 to day 5. 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.

Compare the effect of steam inhalation and diaphragmatic breathing exercise on selected biophysical parameters in relieving dyspnea of patients with COPD.

The comparison of the effect of steam inhalation and diaphragmatic breathing exercise on selected biophysical parameters in relieving dyspnea of patients with COPD In BORG scale the mean post test scores of steam inhalation is 2.9 and in diaphragmatic breathing exercises is 1.7 and it shows diaphragmatic breathing exercise has less dyspnea compared to steam inhalation .Hence it is evident that diaphragmatic breathing exercises is more effective in relieving dyspnea . The respiratory distress observation scale reveals that the mean pretest score of steam inhalation is 3.4 and diaphragmatic breathing exercises is 3.4.Hence it is evident that steam inhalation and diaphragmatic breathing exercises is equally effective in relieving respiratory distress . In peak flow rate analysis of covariance (ANCOVA) is used to determine whether the groups differ in average score regarding Peak flow rate at posttest level as a result of the methods of intervention applied. 69 After correcting the final Peak flow rate scores for difference in initial scores, F statistics applied to the final score. The value of the ANCOVA (F = 1.69, p>0.05) is not significant at 0.05 level. From F value, it is clear that the final average score on Peak flow rate, after adjusted for the initial difference in Steam inhalation (61.5) does not differ from that in the Diaphragmatic breathing (57.7). So it can be concluded that the method of interventions Steam inhalation and Diaphragmatic breathings are equally effective in increasing Peak flow rate.

Table 20 Effectiveness of intervention in Diaphragmatic breathing over Steam inhalation on Peak flow rate (ANCOVA)

		Mean ± SD	df	F	p
Day 1 morning (Pre)	Steam inhalation				
	Diaphragmatic breathing	25.7 ± 14.1	(1,58)	4.24*	0.044
Day 5 evening (Post)	Steam inhalation				
	Diaphragmatic breathing	64.3 ± 17.4	(1,58)	5.83*	0.019
Adjusted post	Steam inhalation	61.5 ± 2			
	Diaphragmatic breathing	57.7 ± 2	(1,57)	1.69	0.199

CONCLUSION

It meets all the objectives of the study and the findings accept the first hypothesis H1 There will be a significant difference on

selected biophysical parameters among COPD clients after giving steam inhalation and diaphragmatic breathing exercise' and reject the second hypothesis H₂ There will be significant difference in diaphragmatic breathing exercise than steam inhalation on relieving dyspnea among COPD patients' as both steam inhalation and diaphragmatic breathing exercise are equally effective in relieving dyspnea among patients with COPD.

DISCUSSION

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

Nursing Practice

1. Steam inhalation and diaphragmatic breathing exercise is a simple but effective treatment for dyspnea associated with COPD, nurses working in medical units can adapt steam inhalation and diaphragmatic breathing exercise for treating the same.
2. Steam inhalation is easily available in practice settings and precious time can be saved.
3. Patients can easily tolerate steam inhalation and diaphragmatic breathing exercise, though it can be administered to all COPD patients.

Nursing Research

- Further nursing studies can be conducted comparing the effects of steam inhalation with that of bronchodilators or other conventional treatments like saline nebulization.
- 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
3. Periodic conference, seminars, and symposiums can be arranged regarding alternative and complementary therapies.

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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