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Effect of specific bronchial hygienic measures to promote breathing pattern in patients with chronic obstructive pulmonary disease

S Lakshmiprabha

HOD, Department of Medical Surgical Nursing, Vinayaka Mission Annapoorana College of Nursing, Vinayaka Missions Research Foundation Deemed to be University, Tamil Nadu, India

Abstract

A quasi experimental study with pre-test and post-test control group design with evaluative approach was conducted to assess the effectiveness of specific bronchial hygienic measures to promote breathing pattern in patients with Chronic Obstructive Pulmonary Disease. Assessment of patients using level of dyspnea scale revealed that the overall control group mean score (6.23+0.55) which is 62% whereas in the experimental group the mean score (5.60+0.27) which is 56% of the total score with an overall difference of 6%. Similarly, in breathing pattern scale, the overall control group mean score (23.33 + 9.46) which is 32% whereas in the experimental group the mean score (13.93 + 5.85) which is 19% of the total score with an overall difference of 13%, revealing the effectiveness of bronchial hygienic measures. Highly significant difference was found between the pretest and posttest of experimental group in both the scales (P<0.001) but no significant association was found between the experimental group post-test when compared with the demographic variables of patients with COPD (P<0.05).

Keywords: Bronchial hygienic measures, promote breathing pattern, patients, chronic obstructive

Introduction

Chronic obstructive pulmonary disease (COPD) as a common preventable and treatable disease, characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases[1]. Bronchial hygienic measures are those which are used for clearing the airway and to improve the breathing pattern in patients. These include chest physiotherapy, postural drainage, suctioning, and other breathing exercises such as Inspiratory muscle training, pursed lip breathing, incentive Spirometry, deep breathing and coughing exercises, etc[2].

Statement of the problem

A study to assess the effectiveness of specific bronchial hygienic measures to promote breathing pattern in patients with Chronic Obstructive Pulmonary Disease (COPD), in selected hospitals, Salem.

Objectives

1. To assess the breathing pattern and level of dyspnea among patients with chronic obstructive pulmonary disease (COPD) in the selected hospitals.
2. To find out the effectiveness of specific bronchial hygienic measures in improving the breathing pattern of COPD patients.
3. To find out the difference between effectiveness of specific bronchial hygienic measures and breathing pattern of patients with COPD.
4. To find out the association between effectiveness of specific bronchial hygienic measures and the demographic variables of patients with COPD.

Hypotheses

H_1: There is no significant difference between effectiveness of specific bronchial hygienic measures and breathing pattern of patients with COPD.

H_2: There is no significant association between effectiveness of specific bronchial hygienic measures in improving breathing pattern and selected demographic variables of patients with COPD.

Methodology

Quasi experimental research study with pre-test and post-test control group design with evaluative approach was used to conduct the study. The study was carried out in Vinayaka Mission Hospital, Salem. It is a 450 bedded hospital. The population of the study was the patients with COPD admitted in Vinayaka Mission Hospital, Salem. The sample for the study was the patients with COPD admitted in Vinayaka Mission Hospital; who were indicated for bronchial hygienic measures. The sample consisted of 30 patients with COPD. Purposive sampling technique was used to select the subjects for the study. Bronchial hygienic measures were provided for the experimental group while the control group patients got only the regular hospital treatment. Structured interview schedule, rating scale to assess the level of dyspnea (Borg's scale) and a rating scale to assess breathing pattern were used to collect data from

patients with COPD.

Ethical consideration

1. Written permission was obtained from Chief Medical Officer of VIMS hospital.
2. The purpose of the study was explained to the patients and written consent was obtained.

Funding: The investigator by herself.

Analyses and interpretation

The highest percentage (46% in control & 53% in experimental group) of the patients with COPD was in the age group of 41-50 yrs in which majority (87% each) of them were males. Highest percentage (53%) of the patients with COPD was having high school education in both the groups and among them the highest percentage (33% in control & 27% in experimental group) were doing some business. Highest percentage (27% in control & 40% in experimental group) of them was having the habit of smoking while another percentage (27% in control & 40% in experimental group) was having both smoking and alcoholism. Among the smokers a good percentage (50% in control & 36% in experimental group) of them smoked 1-10 cigarettes per day while another percentage (40% in control & 46% in experimental group) smoked 11-20 cigarettes per day.

Table 1: Comparison of mean scores of Level of dyspnea scale and Breathing pattern scale of patients with COPD during pre-test of both experimental & control group

	Experimental group		Control group		Mean difference	't'-value	P-value
	Mean	SD	Mean	SD			
Level of Dyspnea Scale	32.53	2.67	32.4	2.64	0.13	0.17	0.8667
Assessment of breathing pattern	26.07	10.71	24.07	10.46	2	0.563	0.582

($p<0.05$ significant, $p>0.05$ not significant)

The comparison of mean scores of Level of dyspnea scale and Breathing pattern scale reveals that, the experimental group mean score was (32.53 ± 2.67) in Level of dyspnea scale and (26.07 ± 10.71) in Breathing pattern scale whereas, in control group it was found that the mean scores were (32.4 ± 2.64) and (24.07 ± 10.46) in Level of dyspnea scale and Breathing pattern scale respectively. Unpaired 't' test was calculated to analyze the significant difference regarding mean scores of experimental and control group during pre-test. It was found that no significant difference was seen in the mean scores of both the groups during the pre-test of level of dyspnea scale as well as breathing pattern scale.

Table 2: Comparison of mean scores of Level of dyspnea scale & Breathing pattern scale of patients with COPD during post-test of both experimental & control group.

	Experimental group		Control group		Mean difference	't'-value	P-value
	Mean	SD	Mean	SD			
Level of Dyspnea Scale	28	1.36	31.13	2.74	3.13	4.18	0.000**
Assessment of breathing pattern	13.93	5.84	23.33	9.46	9.4	3.41	0.004*

(**$p<0.001$ highly significant, *$p<0.01$significant)

The comparison of mean scores of Level of dyspnea scale and Breathing pattern scale reveals that, the experimental group mean score was (28 ± 1.36) in Level of dyspnea scale and (13.93 ± 5.84) in Breathing pattern scale whereas, in control group it was found that the mean scores were (31.13 ± 2.74) and (23.33 ± 9.46) in Level of dyspnea scale and Breathing pattern scale respectively. Unpaired 't' test was calculated to analyze the significant difference regarding mean scores of experimental and control group during post-test. It was found that there was a highly significant ($p<0.001$) difference between the mean scores of both the groups during the post-test of level of dyspnea scale and a moderately significant ($p<0.01$) difference in the breathing pattern scale. Hence it is true difference, not by chance, it can be interpreted that the null hypothesis is rejected and alternative hypothesis is accepted.

No significant association was found between the effects of specific bronchial hygienic measures when compared to their age, sex, education, occupation, area of work, personal habits and no. of cigarettes smoked/day except in the aspect of duration of illness ($p<0.05$) during experimental group post test in both the rating scales.

Discussion

Nield M.A and Soo Hoo G.W (2007) in Taiwan stated that breathing exercises like pursed lip breathing and diaphragmatic breathing provided sustained improvement in exertional dyspnea and physical function of patients with COPD by around 20%. Jones, A. Y. and Jones, R. D. (2005) on "Respiratory physiology and chest physiotherapy techniques: a self-learning exercise for physiotherapy students" stated that chest physiotherapy helps in relieving congestion of the airways. Cazzola, M. (2000) in Philadelphia on "Acute exacerbations in COPD" stated that pursed lip breathing can help the patient control his or her breathing rate as well as hold the airways open during exhalation. This can help reduce carbon dioxide retention, a common problem in patients with COPD. Jones A.P and Rowe B.H (2011) in Birmingham stated that breathing pattern is improved by almost 16.82% with the implementation of bronchial pulmonary hygiene physical therapy. These findings suggest that specific bronchial hygienic measures will definitely help in improving breathing pattern of patients with COPD.

Conclusion

From the findings, it can be concluded that the specific bronchial hygienic measures were effective in improving breathing pattern in patients with COPD irrespective of their demographic variables. Further it can be concluded that the specific bronchial hygienic measures can be an effective intervention for the patients with Chronic Obstructive Pulmonary Disease in improving their breathing pattern.

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