World Journal of Pharmaceutical and Life Sciences
WJPLS
www.wjpls.org
SJIF Impact Factor: 6.129

DEEP BREATHING EXERCISES ON RESPIRATORY STATUS

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Article Received on 22/04/2023 **Article Revised on 12/05/2023** **Article Accepted on 02/06/2023**

ABSTRACT

Statement of the problem: "A study to evaluate effectiveness of deep breathing exercises to improve the respiratory status among patients with Chronic Obstructive Pulmonary Disease in selected hospitals in Kanyakumari District". **Background:** Chronic obstructive pulmonary disease (COPD) is the third leading cause of death worldwide, causing 3.23 million deaths in 2019. Nearly 90% of COPD deaths in those under 70 years of age occur in low- and middle-income countries (LMIC). Breathing exercises are a direct training method for respiratory muscles, and they are highly targeted and less restricted by the environment. It is an effective home-based pulmonary rehabilitation method that can be practiced independently by patients with COPD. There are various types of breathing exercises, including diaphragmatic breathing, pursed-lips breathing, yoga breathing, breathing gymnastics, and singing. **Objectives:** The present study was aimed 1) to assess the respiratory status before and after giving deep breathing exercises among patients with COPD in experimental group and control group. 2) To evaluate the effectiveness of deep breathing exercises in improving the respiratory status by comparing the post test scores of experimental group and control group. 3) To find out the association between the post-test level of respiratory status and selected socio demographic variables in experimental group and control group. **Study design:** Is quasi experimental design- pre test post-test control group design. **Materials and Methods:** convenient sampling technique was adopted to select the samples based on the sampling criteria. Pre test was done to assess the respiratory status of COPD patients using incentive spirometer. Then deep breathing exercises was taught to COPD patients and asked to practice it regularly for 3-5 times daily for 7 days. After 7 days the post test was done to assess the respiratory status of COPD patients by incentive spirometer in both Experimental and control group. **Results:** In experimental group the mean post test score was 780 with standard deviation 215.18.Whereas in control group the mean post-test was 412.66, with standard deviation 247.72. The mean difference was 367.34. The obtained 't' value was 11.85, which is more than the table value P=2.000 with the df 58 at 0.05 level of significance. It was inferred that the respiratory status was improved after deep breathing exercises among COPD patients. C**onclusion:** The study concluded that, Deep breathing exercises are found to be effective in improving the respiratory status of COPD patients.

KEYWORD: COPD, Incentive Spirometer, Respiratory status.

Background of the study

Occupational health is the promotion and maintenance of the highest degree of physical, mental, and social well-being of workers in all occupations by preventing departure from health, controlling risks and the adaptations work to people and people to their jobs.

Due to the occupational hazards the main problems which arise in respiratory system are asthma, Chronic Obstructive Pulmonary Disease (COPD), and lung cancer. Chronic obstructive pulmonary disease (COPD) is one of the most common life-threatening diseases affecting populations globally. Pathophysiological changes in airway, tissue, and vascular supply to lungs increase airway resistance and air trapping, and decrease lung compliance resulting in increased work of breath, and dyspnea in COPD patients.

Breathing exercise (BE) has been an essential part of a comprehensive pulmonary rehabilitation program, for COPD patients. Deep breathing exercises are used to decrease the incidence and severity of pulmonary complications, such as pneumonia, atelectasis, and hypoxemia.

During exercise education, the nurse explains and demonstrates how to take a deep, slow breath, and how to exhale slowly, 3 to 5 times every 1 or 2 hours. A study was conducted by Westerdahl *et al.*, showed that, the patients who performed deep breathing exercises had

better pulmonary function compared to the performing no exercise groups. In their study, Mathew and D'silva detected that in patients with chronic airflow limitation, the practice of deep breathing exercises reduced the respiratory rate and increased alveolar ventilation.

Statement of the problem

"A study to evaluate the effectiveness of deep breathing exercises to improve the respiratory status among patients with Chronic Obstructive Pulmonary Disease in selected hospitals in Kanyakumari district".

Objectives of the study

- To assess the respiratory status before and after giving deep breathing exercises among patients with COPD in experimental group and control group.
- To evaluate the effectiveness of deep breathing exercises in improving the respiratory status by comparing the post test scores of experimental group and control group.
- To find out the association between post-test level of respiratory status and selected demographic variables in experimental group.

Hypotheses

- H1= There will be a significant difference between deep breathing exercises and respiratory status among patients with COPD in experimental group and control group.
- H2= There will be significant association between the Post test level of respiratory status and selected Socio demographic variables in experimental group

Inclusion criteria

The study included,

- Patients with the age group of 30 years and above.
- Both gender included in the study.
- Patients who are diagnosed with COPD.
- Patient who can understand English or Tamil.

Exclusion criteria

This study excluded,

- Patients who are not willing to participate in the study.
- Patients who are suffered with a mental illness.
- Patients with other associated diseases.

Research methodology

To accomplish the objectives of the study "quasi experimental with pre-test post test design was adopted for the present study. The study was conducted in PPK hospital and Annammal hospital, Kanyakumari District. Patients who were diagnosed with COPD and fulfilled the inclusion criteria were included in the study. The samples were selected by using convenience sampling technique. Deep breathing exercises were taught to the patients and assessment was done by using incentive spirometer. The tool was prepared by the investigator after an extensive review of literature and discussion with the experts in the field.

Description of the tools

The data collection tool consists of:

Part I: Demographic data

This section was used to obtain the baseline characteristics of COPD patients. It consists of age, Gender, Education, Occupation, monthly income, Marital status, Type of family, Duration of illness, Nature of work, Food habits, Habits, Exercise pattern.

Part II: Incentive spirometry to assess the lung expansion and respiratory status

Scoring techinique

Grade	Score
Very severe	0-300
Severe	301-600
Moderate	601-900
Mild	901-1100
Normal	1101-1200

Preparation of teaching plan

The teaching plan was developed by reviewing the literature and considering the opinion of the experts. The points kept in mind while preparing teaching plan are:

- Simplicity of language.
- Relevancy of the material.
- Appropriate pictures.

Description of teaching plan

The teaching plan was titled as deep breathing exercise for COPD patients. It consists of the following: Introduction, definition, purposes, procedure, and benefits. The investigatorhave emphasized on the pursed lip breathing and diaphragmatic breathing exercises.

Interventional protocal

Diaphragmatic breathing:

Step 1: Lie on your back in a bed with the knees bent.
Step 2: Place one of your hands on your abdomen and other hand on your upper chest.
Step 3: Inhale through your nose makes your stomach move out and keeps your upper chest as still as possible and when you exhale, exhale your mouth let your stomach fall inward.
Keep Your hand on the upper chest must remain as still as possible during the entireprocedure.

Pursed lip breathing:

Step 1: Sit on a chair or lie on your back comfortably and relax your neck and shouldermuscles.
Step 2: Breathe in (inhale) slowly through your nose for two counts, Keeping your mouthclosed.
Step 3: Breathe out (exhale) slowly and gently through your pursed lips while counting tofour.

Procedure for data collection

The data collection procedure was done for a period of 4 weeks in Annammal hospital, After receiving initial permission from the institution and formal permission from the directors of Annammal hospital to conduct the research study The investigator had done the screening among the COPD patients, 30 patients are taken into Experimental group and 30 patients are taken into control group. Informed consent was obtained from the patients. Convenient sampling technique was used to select the samples for the study. The investigatorincluded both male and female patients. Confidentiality regarding the data was assured to the patients, So as to get their cooperation in the procedure of data collection. The investigator assessed the respiratory status by incentive spirometer for both experimental group and control group and the intervention was carried out by the investigator in the experimental group. The investigator has given the deep breathing exercise for 5-10 minutes for 3-5 times. The investigator assessed the post test by incentive spirometer belonging to experimental group and control group.

Major findings of the study were

1. **Findings related to Frequency and Percentage distribution of COPD patients according to their Demographic variables**

With regard to the age, in experimental group majority 11(36.66%) patients belonged to the age between 51-60 years and least 9(30%) patients belonged to the age between 41- 50years, Whereas in Control group majority 14 (46.66%) patients were between the age group of 51-60years and least 8 (26.66%) both groups belong to this category.

With regard to sex, among COPD patients, in the Experimental group, there was an equal proportion of 15(50%) males and females. Where as in control group 16 (53.33%) were females and 14(46.66%) were males. 50

With regard to education, Majority 17 (56%) and 13 (43.33%) had primary level of education in both the group and minimum of 5 (16.66%) each completed undergraduate degree in both groups.

With regard to income, in the experimental group 13 (43.33%) obtain monthly income of Rs 5000. 12(40%) obtain Rs5000 to 10,000 monthly income which was also similar to control group.

With regard to marital status, majority of them are married of 20 (66.66%) and 17 (56.65) respectively in both groups.

With regard to the type of family, majority of 14 (46.66%) belongs to joint family, in experimental group and 12 (40%) of them belongs to nuclear family in both groups.

With regard to duration of illness, majority of them had illness for 5 years, 21 (70%) and 18 (60%) respectively in both groups.

With regard to Nature of work, majority 13 (43.33%) and 15 (50%) of them were working in the field work respectively in both groups.

With regard to the presence of Habits, among COPD patients in the experimental group, majority 14 (46.66%) had no bad habits in both groups.

2. **Findings related to assess the level of respiratory status among the COPD patients**

With regard to the pre test scores of Respiratory status, in Experimental group, 17 (56.66%) are very severe, 8 (26.66%) are severe, 5 (8.3%) are moderate group. With regardto the pre test scores of Respiratory status, in Control group, 17 (56.66%) are very severe, 9 (30.00%) are severe, 4 (13.33%) are moderate group 57 With regard to the post test scores of Respiratory status, in Experimental group, 20 (66.66%) are moderate, 5 (16.66%) are severe,2 (6.66%) are mild and 3 (10.00%) are normal. With regard to the post test scores of Respiratory status, in Control group, 14 (46.66%) are very severe, 10 (33.33%) are severe, 6 (20.00%) are moderate

3. **Findings related to the effectiveness of breathing exercises to improves the respiratory status among COPD patients in Experimental group**

In the post test, the Experimental group showed a mean value of 780 with standard deviation of 215.18 and the Control group showed a mean value of 412.66 with a standard deviation of 247.72. The calculated unpaired t-test value was 11.85 which showed a significant difference in the post test level of Low Back Pain between Experimental and Control group.

4. **Findings related to Association between the post test level of respiratory status among COPD patients in Experimental group with their selected demographic variables**

Chi square revealed that there was a significant association between post test level of respiratory status and demographic variables such as Age, Gender, Habits, and Exercise pattern of COPD patients. There is a significant association between the level of respiratory status and selected demographic variables such as Age (14.9), Gender (10.6), Habits (22.7), and exercise pattern (12.59) and there is no significant association between the level of respiratory status and selected demographic variables such as education, income, marital status, type of family, and nature of work. Hence research hypothesis (H2) was accepted.

Recommendations

The following steps can be undertaken to strengthen the study:

a. A similar study can be conducted among large samples for better generalization.

b. A similar study can be conducted among patients with other respiratory disorders.
c. A similar study can be conducted by giving the exercise for a long duration.
d. The exercises can be included in the hospital policy
e. The similar exercises can be educated to the public who are at risk of getting in breathing difficulty, increase sputum collection.

CONCLUSION

The study concluded that deep breathing exercises improve the respiratory status among COPD patients. Deep breathing exercises were not only cost effective but also easy to follow. The COPD patients can include the exercises in their routine activities. Nurses can educate the COPD patients and the family members about the deep breathing exercise in order to create awareness about the problems. This can help the COPD patients to prevent the complications and by advising and training them to do these exercises, by which the quality of care can be extended to them. Therefore the investigator felt that, more importance should be given for deep breathing exercises to improve the respiratory status among COPD patients. If the exercises are included in the hospital routine policy, the aim of the research would be fulfilled and the expectations will be achieved.

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