Original Research Article

TO ASSESS THE EFFECTIVENESS OF SELECTED BREATHING EXERCISES AMONG CHRONIC OBSTRUCTIVE PULMONARY DISEASE PATIENTS.

ABSTRACT

INTRODUCTION

Mortality rate of chronic obstructive pulmonary disease (COPD) is more than 3 million people every year, making it 3rd largest cause of death in the world. It has been estimated that by the year 2030 chronic obstructive pulmonary disease will become the third biggest cause of death. chronic obstructive pulmonary disease (COPD) is a progressive irreversible airway disease characterized by emphysema and chronic bronchitis, resulting in breathlessness, cough and sputum as the disease progresses, subjects with COPD experience increasing deterioration of their health-related quality of life (HRQOL), with greater impairment in their ability to work and declining participation in social and physical activities. Hence practicing pursed lip breathing exercise in their daily routine will improve their breathing pattern and quality of life.

OBJECTIVES:-

1.To assess the breathing pattern of chronic obstructive pulmonary disease patient.

2.To assess the effectiveness of selected breathing exercises among the chronic obstructive pulmonary disease patients.

3. To associate the effectiveness of selected breathing exercises among chronic obstructive pulmonary disease patient with their demographic variables.

MATERIAL AND METHODS:

The research approach used for the study was interventional evaluatory approach. The study was conducted in respiratory unit at Wardha City Maharashtra, India, using one group pre test post

test design without control group. Non probability purposive sampling technique was used for selecting 60 COPD patients. On the first day pre test assessment of breathing pattern with the help of borg rating scale and provided pursed lip breathing exercise for 20 minutes, 2 times in a day and it was continued for 15 days followed by post test on the 15th day. The data collected, tabulated and analysed in terms of objectives of study using descriptive and inferential statistics.

RESULTS: The mean post test score. The overall comparison of selected breathing exercise among COPD patients at rest pre test score was higher 3.48 with SD of ±1.25 when compare with at rest post test score which was 0.91 with SD of ±0.85.The statistical Student's paired t test implies that the difference in the selected breathing exercise among COPD patients was found to be 18.98 which is statistically significant at 0.05% level of significance. Also the overall comparison of selected breathing exercise among COPD patients during activity pre test score was higher 7.95 with SD of ±1.50 when compared with during activity post test score which was 2.76 with SD of ±1.02 . The statistical Student's paired t test implies that the difference in the selected breathing exercise among COPD patients was found to be 18.98 which is statistically significant at 0.05% level of significance. Hence it is statistically interpreted that effectiveness of selected breathing exercises among COPD patients at rest and during activity in post test was effective. The tabulated values was much higher than the calculated' values at 5% level of significance, also the calculated 'p-value which was much higher than the acceptable level of significance i.e. 'p'=0.05. Hence the association of effectiveness of selected breathing exercises is statistically not associated with demographic variables.

CONCLUSION: According to the results of this study, patients with Chronic Obstructive Pulmonary disease patients who practiced pursed lip breathing exercise 20 minutes, 2 times a day for 15 days had improvement of the breathing pattern which was statistically proved . Hence pursed lip breathing exercise was cost effective, non invasive, and highly feasible. Hence the

researcher concluded that pursed lip breathing exercise can be practice as an effective intervention on improving breathing pattern among chronic obstructive pulmonary disease patients.

KEYWORDS: Breathing Exercise, Borg Scale, Chronic Obstructive Pulmonary Disease.

INTRODUCTION-

Chronic Obstructive Pulmonary Disease (COPD) is a progressive, non recoverable airway disease defined by emphysema and chronic bronchitis, resulting in breathlessness, cough and sputum. As the disease progresses, subjects with COPD experience a growing decline in their health related quality of life (HRQOL) with a substantial deterioration in their ability to work and a reduction in their participation in social and physical activities.[1]

Chronic obstructive pulmonary disease (COPD) is a major respiratory disease affecting the quality and length of life around the globe. The World Health Organization describes COPD as a lung disease characterized by recurrent obstruction of lung airflow which obstructs normal breathing and is not completely reversible.[2]

It is estimated that COPD is at risk of 3.15 million deaths per year and that there were 251 millio n COPD diseases worldwide in 2016.[3]

It is the term used to refer to chronic lung diseases that restrict lung airflow, but Chronic Obstructive Pulmonary Disease (COPD) does not refer to a specific disease. Today chronic emphysema and bronchitis are no longer used but are treated with COPD. The signs of COPD are ' need for oxygen, ' excessive sputum development, breathlessness, chronic coughing. COPD is not just a "smoker's cough," but also a low diagnostic, critically lung disease that may increasingly lead to death.[4]

The healthcare burden of COPD can be as high as $50 billion in countries like US where COPD is the third leading cause of mortality.[5] Due to its association with smoking and environmental pollution, the burden is much higher in low and middle-income countries. An estimation shows that more than 90% COPD-related deaths happen in those countries and India is no exception for sch a tremendous public health problem.[3,6]

MATERIAL AND METHODS:

The research approach used for the study was interventional evaluatory approach. The study was conducted in respiratory unit at Wardha City Maharashtra, India, using one group pre test post test design without control group. Non probability purposive sampling technique was used for selecting 60 COPD patients. On the first day pre test assessment of breathing pattern with the help of borg rating scale and provided pursed lip breathing exercise for 20 minutes, 2 times in a day and it was continued for 15 days followed by post test on the 15th day. The data collected, tabulated and analysed in terms of objectives of study using descriptive and inferential statistics.

DESCRIPTION OF THE TOOL

The tool consists of two section.

Section A- It consists of demographic variables of the chronic obstructive pulmonary diseases patients such as age, gender, education, income, occupation, duration of disease, knowledge regarding breathing exercise, source of information, number of hospital visits respectively.

Section B- Pursed lip breathing exercise.

- Borg scale score at rest and during activity.
- Score interpretation.

Table- Blue print and score method of the perceived excretion measured by borg scale.

Level of breathing exercise	Score Range
Very Light Activity	≤1
Light Activity	2-3
Moderate Activity	4-6
Vigorous Activity	7-8
Very Hard Activity	9
Max Effort Activity	10

RESULTS –

- **Distribution of chronic obstructive pulmonary disease patients with regards to demographic variables.**

1. Majority of the subjects were in the age group of 51-60 years that is 31.7%, 28.30% were in the age group of 61-70 years, 20% were in the age group of 41-50 years and more than 70 years.
2. Majority of the samples 58.30% were females, and 41.70% were males.
3. Majority of the subjects were having family income of Rs 20001 and more that is 36.70%,, 30% had between 15001-20000 Rs, 18.30% had between 10001-15000 Rs and 15% were 9000-10000 Rs.
4. Majority of the subjects 36.7% were educated up to primary, 21.70% were educated up to secondary, 18.3% were illiterate, 18.3% were educated up to higher secondary, 3.3% were graduates and 1.70% were PG and above.

5. Majority of the subjects 30% farmer, 28.3% were doing private services, 20% were labour, 13.3 were in government service, and only 8.3% were from other profession.
6. Majority of the subjects were 33.30% tobacco chewers, 26.70% were household smokers, 23.30% had habits of cigarette smoking, 13.30% had habit of passive smoking and 3.30% had other habit.
7. Majority of the subjects were 33.30% had duration of disease 2-3 years, 23.30% had duration of disease 3-4 years and more than 4 years.
8. Majority of the subjects were 70% had knowledge about breathing exercise and 30% of them had no knowledge about breathing exercise.
9. Majority of the subjects were 23.30% had information from relatives 23.30% had information from friends, 13.30% had information from mass media and other sources.
10. As per number of hospital visits majority of the subjects 35% visited more than 6 times, 23.30% visited between 3-4 times, 21.70% visited between 5-6 times and 20% visited 1-2 times.

Assessment of breathing pattern among chronic obstructive pulmonary disease patients.

1. Distribution of COPD patients according to level of selected breathing exercises at rest.

In pre test 3.33% subjects were having very light activity at rest. 48.33% were having light activity, 48.33% were having moderate activity. Were as in post test at rest 80% had very light activity, 18.33% had light activity and 1.67% had moderate activity.

Mean breathing exercise score at rest pre test was 3.48 ± 1.25 and in at rest post test it was 0.91±0.85.

2. **Distribution of COPD patients according to level of selected breathing exercises during activity.**

In pre test during activity no subjects had very light activity and light activity, 16.67% had moderate activity, 43.33% had vigorous activity, 25% had very hard activity, were as 15% had max effort activity. In post test 8.33% had very light activity, 66.67% had light activity and 25% had moderate activity

Mean breathing exercise score during activity pre test was 7.95 ± 1.50 and during activity post test it was 2.76 ± 1.02.

Effectiveness of selected breathing exercises among the chronic obstructive pulmonary disease patients.

1. **Significance of difference between selected breathing exercises among the COPD patients at rest pre and post test.**

The overall comparison of selected breathing exercise among COPD patients at rest pre and post test which reveals that at rest pre test score was higher 3.48 with SD of ±1.25 when compared with at rest post test score which was 0.91 with SD of ±0.85.

The statistical Student's paired t test implies that the difference in the selected breathing exercise among COPD patients was found to be 18.98 which is statistically significant at 0.05% level of significance.

Hence it is statistically interpreted that level of selected breathing exercises among COPD patients at rest post test was effective. Thus H1 is accepted and H0 is rejected.

2. **Significance of difference between selected breathing exercises among the COPD patients during activity pre and post test.**

The overall comparison of selected breathing exercise among COPD patients during activity pre and post test which reveals that during activity pre test score was higher 7.95 with SD of ±1.50 when compared with during activity post test score which was 2.76 with SD of ±1.02 .

The statistical Student's paired t test implies that the difference in the selected breathing exercise among COPD patients was found to be 32.60 which is statistically significant at 0.05% level of significance.

Hence it is statistically interpreted that level of selected breathing exercises among COPD patients during activity post test was effective. Thus H1 is accepted and H0 is rejected.

Association effectiveness of breathing exercise with selected demographic variables of chronic obstructive pulmonary disease patients.

1. **Association of effectiveness of selected breathing exercises at rest post test with demographic variables.**

The association of level of selected breathing exercises with demographic characteristics of COPD patients. The tabulated values was much higher than the calculated' values at 5% level of significance. Also the calculated 'p-value which was much higher than the acceptable level of significance i.e. 'p'=0.05. Hence it is interpreted that socio-demographic characteristics of COPD patients is statistically not associated with their level of selected breathing exercise at rest post test.

2. **Association of effectiveness of selected breathing exercises during activity post test with demographic variables.**

The association of level of selected breathing exercises with demographic characteristics of COPD patients. The tabulated values was much higher than the calculated' values at 5% level of significance except for occupation. Also the calculated 'p-value which was much higher than the acceptable level of significance i.e. 'p'=0.05. Hence it is interpreted socio-demographic characteristics of COPD patients is statistically not associated with their level of selected breathing exercise during activity post test.

DISCUSSION

The study was conducted to assess the effectiveness of selected breathing exercises among chronic obstructive pulmonary disease patients it was aimed to improve breathing pattern at rest and during activity. The mean post test score. The overall comparison of selected breathing exercise among COPD patients at rest pre test score was higher 3.48 with SD of ±1.25 when compare with at rest post test score which was 0.91 with SD of ±0.85.

The statistical Student's paired t test implies that the difference in the selected breathing exercise among COPD patients was found to be 18.98 which is statistically significant at 0.05% level of significance.

The overall comparison of selected breathing exercise among COPD patients during activity pre test score was higher 7.95 with SD of ±1.50 when compared with during activity post test score which was 2.76 with SD of ±1.02 .

The statistical Student's paired t test implies that the difference in the selected breathing exercise among COPD patients was found to be 18.98 which is statistically significant at 0.05% level of significance.

Hence it is statistically interpreted that effectiveness of selected breathing exercises among COPD patients at rest and during activity in post test was effective. Thus H1 is accepted and H0 is rejected.

The tabulated values was much higher than the calculated' values at 5% level of significance. Also the calculated 'p-value which was much higher than the acceptable level of significance i.e. 'p'=0.05. Hence The association of effectiveness of selected breathing exercises is statistically not associated with demographic variables.

A similar study conducted by Mrs. R. Latha, at tamilnadu to investigate the effectiveness of Pursed Lip-Breathing Exercise on breathing pattern among 100 patients with Chronic Obstructive Pulmonary Disease patients. Study conducted with Pre experimental –one group pre test post test research design with100 samples selected in consecutive sampling technique at Medical Ward . Pursed-Lip Breathing Exercise for 3minutes,3 times day for about 10days was given to the subjects. Findings: There is significance difference between the pre and post test mean score (150.14- 171.32). The findings suggests that the Pursed Lip Breathing Exercise can be practice regularly by patients with Chronic Obstructive Pulmonary Disease to improve the breathing pattern.[7]

G. Dechman(2014) conducted a study to evaluate the efficacy of pursed-lip breathing (PLB) and diaphragmatic breathing (DB) in the rehabilitation of people with chronic obstructive pulmonary disease (COPD) remains unclear. This review examines the evidence regarding the usefulness of these techniques in improving the breathing of people with stable COPD.. Pursed-lip breathing slows the respiratory rate, and evidence suggests that this decreases the resistive pressure drop across the airways and, therefore, decreases airway

narrowing during expiration. This decrease in airway narrowing may account for the decreased dyspnea some people experience when using this technique. Diaphragmatic breathing has negative and positive effects, but the latter appear to be caused by simply slowing the respiratory rate. They concluded evidence supports the use of PLB, but not DB, for improving the breathing of people with COPD.[8]

A similar study was conducted to assess the effectiveness of teaching programme on pulmonary rehabilitation. The objective of the study was to assess the short-term and long-term effects of pulmonary rehabilitation on quality of life. They selected Forty-three out patients with COPD. Patients were randomized to one of three treatment groups: exercise training alone, exercise training plus activity training, and exercise training plus a lecture series. The mean treatment period was 10 weeks. The study concluded that teaching programme with exercise training was effective in improving the knowledge of pulmonary rehabilitation among patient with COPD.[9]

CONCLUSION

According to the results of this study, patients with Chronic Obstructive Pulmonary disease patients who practiced pursed lip breathing exercise 20 minutes, 2 times a day for 15 days had improvement of the breathing pattern which was statistically proved . Hence pursed lip breathing exercise was cost effective, non invasive, and highly feasible. Hence the researcher concluded that pursed lip breathing exercise can be practice as an effective intervention on improving breathing pattern among chronic obstructive pulmonary disease patients.

ETHICAL APPROVAL

Ethical clearance- Taken from Ref. No. DMIMS (DU)/IEC/Jan-2018-19/7765

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