EFFECTIVENESS OF PURSED LIP BREATHING EXERCISE ON DYSPNOEA AMONG CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD) PATIENTS.

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ABSTRACT

Chronic Obstructive Pulmonary Disease is a progressive disease condition strongly associated with dyspnoea and exercise limitation in activities of daily life. So far there is no cure for this disease only effort to alleviate the symptoms. It is therefore of great importance to define effective Pursed Lip Breathing technique to relieve symptoms and to motivate patients to exercise. The objectives of the study were to assess the pre and post-test dyspnoea score among chronic obstructive pulmonary disease (COPD) patients in experimental and control groups and also to evaluate the effectiveness of pursed-lip breathing on the level of dyspnoea. Quasi-experimental design, pretest-posttest non-equivalent control group design was adopted, 160 samples were diagnosed as COPD, and falls mild to moderate dyspnea. Data collected through demographic variables and dyspnoea scores by using Modified (UCSD) the University Of California, San Diego Shortness of Breath Questionnaire. 15-items were measured while performing a variety of activities of daily living. Pursed lip breathing exercises are given in the intervention program for 5 days and the Results concluded that chronic obstructive pulmonary disease (COPD) patients in experimental group overall p-value score ($p < 0.001$) revealed highly significant differences in pre and post a comparison of reduction of dyspnoea score in the experimental and control group. Keywords: COPD, pursed-lip breathing exercises, dyspnoea.

Key Words: Pulmonary disease, Lip Breathing Exercise.

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INTRODUCTION

Chronic obstructive pulmonary disease (COPD) refers to the conditions of a combination of chronic bronchitis and emphysema, resulting in airway obstruction and poor oxygen transport in the lungs, respectively. It is a progressive lung disease that is not fully reversible. The hallmark of the disease is shortness of breathing that gradually gets worse over time. Dyspnoea is "a term used to characterize a subjective experience of breathing discomfort that consists of qualitatively distinct sensations that vary in intensity. Pursed Lip Breathing Exercise is one of the effective rehabilitation approaches for relaxation and easily practicable, it helps the vital balance of blood gases and also to relieve shortness of breath. Many of the populations documented the patients with Chronic Obstructive Pulmonary Disease and found that they have decreased quality of life and daily activities. Looking into the above-mentioned reason the researcher decided to conduct the study to assess the effectiveness of Pursed Lip-Breathing Exercise to improve breathing patterns and quality of life among patients with Chronic Obstructive Pulmonary Disease.

NEED FOR THE STUDY

According to the global burden of disease (GBD) in the year of 2016, a prevalence of 251 million cases of COPD has been reported globally. Nearly 65 million people have been diagnosed with a moderate to severe degree of COPD. There were 3.17 million deaths caused by this disease in 2015 (that is, 5% of all deaths globally in that year). Based on the socioeconomic status the low and middle-income countries more prevalence of deaths due to COPD which is above more than 90% .this is because of higher exposure of tobacco intake and smoking (either active or passive) are the primary risk factors. In addition to that, other factors include exposure to indoor and outdoor pollution, occupational dust, and fumes (WHO2017).

Currently, there are about 98 million smokers in India and the total burden of COPD is about 14.84 million in 2011, doubled from 6.45 million in 1971 as per WHO. Management of patients with COPD, the strategy includes pharmacological and non- pharmacological approaches which include pulmonary rehabilitation occupying a vital part.

Prabhu Rajkumar et.al., (2017) conducted a cross-sectional study on the prevalence of the chronic obstructive pulmonary disease in a population of suburban areas of Chennai and shilling which represents a southern and northern region of India Prevalence of COPD is estimated that at 3.49% in India ranging from 1.1% in Mumbai to 10% in Thiruvananthapuram. The burden of Obstructive Lung Disease (BOLD) conducted a study in Pune, Mumbai, and Srinagar and reported overall COPD prevalence estimate of 6.25% 6.8% and 16.05%, and identified the risk factors for COPD were smoking air pollution and important comorbid conditions chronic respiratory disorder such as asthma and post tuberculosis.

PROBLEM STATEMENT:

"Effectiveness of pursed-lip breathing exercise on dyspnoea among chronic obstructive pulmonary disease (COPD) patients."

OBJECTIVES:

1. To assess the pre and post-test dyspnoea score among chronic obstructive pulmonary disease (COPD) patients in the experimental group and control group
2. To evaluate the effectiveness of pursed-lip breathing on the level of dyspnoea among chronic obstructive pulmonary disease (COPD) patients
3. To find the association between dyspnoea score and with their selected demographic variables

RESEARCH METHODOLOGY

- **Research approach and design:** an evaluative research approach Quasi-experimental design, pretest-posttest non-equivalent control group design respectively.
- **The setting of the study:** Medicine department in PES hospital, kuppam.
- **Participants:** All the patients who are diagnosed as COPD and admitted in PESIMSR Kuppam.
- **Sample:** patients who are diagnosed as COPD and fall mild to moderate dyspnoea.

- **Sample size:** Power analysis used for sample size confirmation, N 80 in experimental, and N 80 in the control group. Total of 160.
- **Sample technique:** The nonprobability convenience sampling technique was used to select samples.

SAMPLING CRITERIA:

Inclusion criteria: The COPD patients who

- Falls between the age range of 30-70year
- Have mild to moderate degree of dyspnoea

Exclusive criteria:

- Patients who were not willing to participate.
- Patients with very severe dyspnoea.

DEVELOPMENT OF THE TOOL:

Based on the exclusive review literature tool was prepared and validated by 6 nursing experts. A pilot study was feasible and reliable to conduct the main study. The tool mainly has two domains PART A: It deals with socio-demographic variables. It consists of 14 items like age in years, sex, education, occupation, marital status, place of residence, duration of illness, medical treatment, income per month, comorbid condition, smoking habits, years of smoking, exposure of allergens, and family history of COPD. PART B: Dyspnoea scale by Modified (UCSD) the University Of California, San Diego Shortness of Breath Questionnaire. These 15-items assess self-reported of shortness of breath while performing a variety of activities of daily living.

DATA COLLECTION PROCEDURE:

Demographic variable and the Modified University of California, San Diego Shortness of Breath Questionnaire were used to collect the data from subjects. The intervention was given in the form of pursed-lip breathing to COPD patients with frequency 5 minutes, 3 times a day for 5 days. 5th-day evening post-test dyspnoea scores were assessed, Subjects were asked to follow pursed-lip breathing following all incidences of shortness of breath during their daily activities.

FINDINGS:

DEMOGRAPHIC DATA

The majority of participants involved in this research had the age range above 61 years and 30% in experimental and 41.25 % in the control group respectively, and educational status most of the participants were gained primary and secondary schooling grades nearly 47.5 % in both the groups. 53.75 % were employed workers, closely 69% were married. 56.2 % were residence of rural areas. 91.25% were suffering from a chronic obstructive pulmonary disease for 1-3 years, 43.75 % were receiving regular treatment, and 52.50% receiving irregular treatment. In experimental (42.50%) and control groups (31.25 %), monthly wages were reported above 15000 Indian rupees. the primary history of hypertension was 33.75% and smoking history was around 47.50 %.

Table 1: Item wise distribution of Pre-test and post-test dyspnoea score among chronic obstructive pulmonary disease (COPD) patients in the experimental group.

Experimental group		Mean	Std.dev	Min	Max	Max possible score	Mean %	Dyspnoea reduction score %
USCD 1	Pre test	2.5	1.01	1	5	5	50	25.4
	Post test	1.23	0.76	0	3	5	24.6	
UCSD2	Pre test	2.51	0.95	1	5	5	50.2	28
	Post test	1.11	0.81	0	3	5	22.2	
UCSD3	Pre test	3.77	0.92	1	5	5	75.4	37.2
	Post test	1.91	1.05	0	4	5	38.2	
UCSD4	Pre test	3.82	0.88	1	5	5	76.4	38
	Post test	1.92	0.96	0	4	5	38.4	
UCSD5	Pre test	3.03	0.89	1	5	5	60.6	34
	Post test	1.33	0.92	0	3	5	26.6	
UCSD6	Pre test	3.08	0.94	1	5	5	61.6	31.2
	Post test	1.52	0.87	0	3	5	30.4	
UCSD7	Pre test	3.57	0.72	1	5	5	71.4	42.4
	Post test	1.45	0.79	0	3	5	29	
UCSD8	Pre test	3.57	0.70	1	5	5	71.4	46
	Post test	1.27	0.79	0	3	5	25.4	
UCSD9	Pre test	3.65	0.90	1	5	5	73	44.4
	Post test	1.43	0.95	0	3	5	28.6	
UCSD1	Pre test	4.08	0.84	1	5	5	81.6	40.2
	Post test	2.07	0.80	1	4	5	41.4	
UCSD1	Pre test	3.26	0.99	1	5	5	65.2	36.8
	Post test	1.42	0.74	0	3	5	28.4	
UCSD1	Pre test	3.17	1.04	1	5	5	63.4	34.2
	Post test	1.46	0.84	0	4	5	29.2	
UCSD1	Pre test	3.41	0.77	1	5	5	68.2	44.2
	Post test	1.2	0.75	0	3	5	24	
UCSD1	Pre test	4.12	0.81	1	5	5	82.4	42.2
	Post test	2.01	0.94	0	4	5	40.2	
UCSD1	Pre test	3.91	0.82	2	5	5	78.2	42.6
	Post test	1.78	0.80	0	3	5	35.6	

The data in Table 1 shows that in the experimental group, the mean percentage of pre and post-test dyspnoea scores were as follows at rest 50% in pre and 24.6% in the post test. The score was obtained 50.2% and 22.2 % in pre and post while brushing the teeth. During walking the score were observed 75.4% and 38.2% in pre and post and in the same comparison between pre and post in different actions were documented as follow as while walking upstairs 76.4% and 38.4%,while eating 60.6% and 26.6%, standing up from a chair 61.6% and 30.4%,bathing 71.4% and 29%,,dressing 71.4% and 25.4%,during dishes 73% and 28.6% ,sweeping, cum vacuuming 81.6% and 41.4 % ,making bed 65.2% and 28.4% ,shopping 63.4% and 29.2%,while combing hair 68.2% and 24% ,while traveling 82.4% and 40.2%,walking on a level of at your own pace 78.2% and 35.6%.

In the control group, the mean percentage of pre and post-test dyspnoea scores were as follows at rest 53.4% in pre and 50% post-test. While brushing the teeth,57.2% and 50 %,during walking 75.6% and 75.4%,while walking upstairs 77% and 76.4%,,while eating 63.4% and 60.6%, standing up from a chair 63.4% and 61.6%,bathing 72.4% and 71.4%,,dressing 71.2% and 71%,during dishes 72% and 70.6%, sweeping, cum vacuuming 75.6% and 76.6 % ,making bed 76.% and 75.2 % ,shopping 67 % and 65%,while combing hair 67.4% and 65.2% ,while traveling 72.6% and 72.4%,walking on a level of at your own pace 83 % and 82.4%.

Table 2: item wise mean, SD, t value score on the effectiveness of pursed-lip breathing on the level of dyspnoea among chronic obstructive pulmonary disease (COPD) patients in the experimental group.

Experimental group		Mean	SD.error	Std.dev	M.Diff	SE.Diff	SD Diff	t VALUE	P VALUE
UCSD 1	Pre test	2.5	0.11	1.01	1.26	0.14	1.29	8.75	0.00
	Post test	1.23	0.08	0.76					
UCSD2	Pre test	2.51	0.10	0.95	1.4	0.14	1.32	9.43	0.00
	Post test	1.11	0.09	0.81					
UCSD3	Pre test	3.77	0.10	0.92	1.86	0.153	1.37	12.11	0.00
	Post test	1.91	0.11	1.05					
UCSD4	Pre test	3.82	0.09	0.88	1.9	0.151	1.35	12.53	0.00
	Post test	1.92	0.10	0.96					
UCSD5	Pre test	3.03	0.09	0.89	1.7	0.156	1.39	10.86	0.00
	Post test	1.33	0.10	0.92					
UCSD6	Pre test	3.08	0.10	0.94	1.56	0.13	1.22	11.45	0.00
	Post test	1.52	0.09	0.87					
UCSD7	Pre test	3.57	0.08	0.72	2.125	0.11	1.07	17.73	0.00
	Post test	1.45	0.08	0.79					
UCSD8	Pre test	3.57	0.07	0.70	2.3	0.11	1.011	20.34	0.00
	Post test	1.27	0.08	0.79					
UCSD9	Pre test	3.65	0.10	0.90	2.21	0.149	1.33	14.79	0.00
	Post test	1.43	0.10	0.95					
UCSD10	Pre test	4.08	0.09	0.84	2.01	0.133	1.19	15.0	0.00
	Post test	2.07	0.09	0.80					
UCSD11	Pre test	3.26	0.11	0.99	1.83	0.14	1.29	12.67	0.00
	Post test	1.42	0.08	0.74					
UCSD12	Pre test	3.17	0.11	1.04	1.71	0.15	1.41	10.81	0.00
	Post test	1.46	0.09	0.84					
UCSD13	Pre test	3.41	0.08	0.77	2.21	0.11	0.98	19.99	0.00
	Post test	1.2	0.08	0.75					
UCSD14	Pre test	4.12	0.09	0.81	2.11	0.14	1.30	14.50	0.00
	Post test	2.01	0.10	0.94					
UCSD15	Pre test	3.91	0.09	0.82	2.16	0.13	1.22	15.76	0.00
	Post test	1.78	0.09	0.80					

Table 2 shows mean SD, difference, mean difference t value of the effectiveness of pursed-lip breathing on the level of dyspnoea among chronic obstructive pulmonary disease (COPD) patients in the experimental group. overall p-value score ($p < 0.001$) revealed highly significant differences in pre and post a comparison of all the items listed in the dyspnoea questionnaire in the experimental group and found no significant items to control group.

Nithyanada (2018) quasi-experimental non-equivalent control group design was used to assess the effectiveness of pursed-lip breathing exercises on dyspnoea among 60 COPD patients, the results show that, computed t value highly significant $p < 0.05$. there was a reduction in dyspnea score among the experimental group.

Table 3: mean, mean percentage of pre-test and post-test dyspnoea scores of the experimental and control group.

Dyspnoea score		Min score	Max score	Max Possible score	mean	Mean %	Dyspnoea reduction score
Experimental group	Pre test	16	75	75	51.45	68.6	37.79
	Post test	1	50	75	23.11	30.81	
Control group	Pre test	21	75	75	52.36	69.81	1.56
	Post test	16	75	75	51.19	68.25	

CONCLUSION

There was a significant association between pre-test dyspnoea score and demographic variables such as (Pr0.002) marital status, duration of illness, (Pr 0.000) comorbid condition (Pr0.004) and there was no significant association between other variables.

RECOMMENDATION:

The future research might be focused on with various domains, by using multiple standardized test tools with larger population and including all the types of patients with dyspnoea score, patients with COPD, and also the future study can be carried out including all the types of respiratory disease.

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