

Original Research Article

A Study to Assess the Effectiveness of the Functional Capacity of Lungs and Quality of Life among Patients with Chronic Obstructive Pulmonary Disease [COPD] in Selected Hospital at Cuddalore District

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ABSTRACT

Background: NCDs [Non Communicable Diseases] are the number one cause of death around the world. According to the WHO, NCDs kill 41 million people each year, equivalent to 71% of all deaths globally. When assessing chronic respiratory diseases, the India GBD Collaborators show that these diseases- mainly chronic obstructive pulmonary disease (COPD) and asthma- make the second largest contribution to the total mortality burden of India, at 10-9%.

Methods: A quasi experimental study was conducted to assess the effectiveness of breathing retraining on functional capacity of the lungs and quality of life among 100 patients with COPD. Using purposive sampling method, study participants were asked to complete the self-administered questionnaire to get basic data and St. George Respiratory Questionnaire [SGRQ] was used to assess QOL [quality of life] and functional capacity of the lungs was measured by using spirometry.

Results: The results revealed that 64% the subjects were in the age group of 55-65 years and they were males leading moderate quality of life. After the intervention the study findings revealed that the mean score of FEV1/FVC was found to be increased from 68.86 in the pretest to 75.92 in 3rd month and 79.42 in the 6th month and 20% of them changed their QOL from moderate to good quality of life.

Conclusion: The nurses are in a key position to assess the quality of life among patients with COPD & assist them to identify the factors deteriorating their health and implement self management programme that can prevent the negative consequences of on their health. Hence breathing retraining programme has to be incorporated in treatment schedule.

Key words: COPD, QOL, HRQoL, Functional capacity of lungs, Spirometry & FEV1\FVC

INTRODUCTION

NCDs [Non Communicable Diseases] are the number one cause of death worldwide, with 38 million people dying due to NCDs in 2012-equivalent to 68% of the 56 million global death toll [WHO,

2010]. The biggest burden of NCDs is in the low- and middle-income countries, where 80% of all NCD-related deaths were reported in the year 2005. [World Health Organization, Chronic Disease Report, 2005). Also, chronic diseases are estimated

to account for 53% of all deaths and 44% of disability-adjusted life-years (DALYs) lost

in 2005.

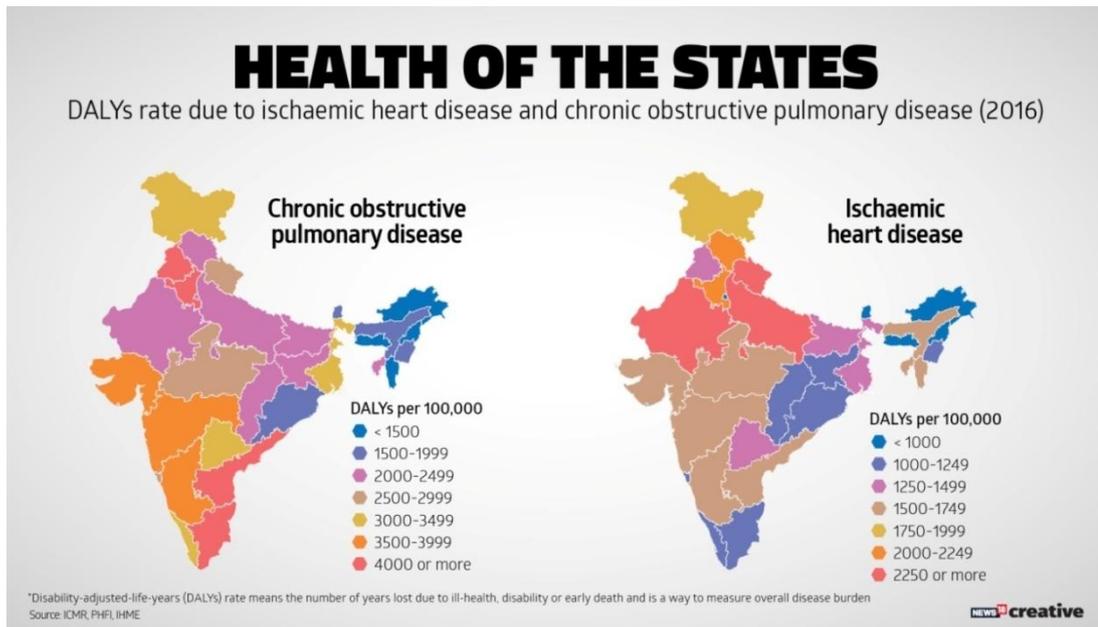


Figure ; 1 Geographic distribution of DALYs due to COPD per 100000 population in India
Source; ICMR-PHFI-IHME ,2017 India : Health of the Nation's States

According to the definition of WHO, NCDs are preventable diseases through lifestyle modification of the common causes such as unhealthy diet, physical inactivity, tobacco use and excessive alcohol use. In India, Non-Communicable Diseases (NCDs) accounted for 40% of all hospital stays and 35% of all outpatient visits in 2004. [Mahal, Karan and Engelgau 2009].

Disorders of the respiratory system can be classified into four general areas such as Obstructive conditions (e.g., emphysema, bronchitis, COPD and Bronchial asthma), Restrictive conditions (e.g., fibrosis, sarcoidosis, alveolar damage, pleural effusion), Vascular diseases (e.g., pulmonary edema, pulmonary embolism, pulmonary hypertension) and Infectious, environmental and other "diseases" (e.g., pneumonia, tuberculosis, asbestosis, particulate pollutants). COPD is a non-curable disease, which progressively reduces breathing capacity and impairs patients' ability to carry out activities of daily living, thereby adversely affecting health-related quality of life (HRQOL).[Jones. et al.2006]. While evaluating of COPD patients, due importance needs to be

given to QOL measurement similar to that given to pulmonary function test.[Malik Shanawaz Ahmed 2016].

OBJECTIVES; A study was conducted to assess the effectiveness of Breathing Retraining on functional capacity of lungs and quality of life among patients with COPD in selected hospital at Cuddalore District.

MATERIAL AND METHODOLOGY

The research design employed for this study was quasi experimental design in that the two groups pre test post test control group design was adopted among 100 patients with COPD.

Purposive sampling technique was used to select the sample from both the groups.

Criteria for sample collection;

Inclusion criteria

Patients in the age group of 35-60 yrs include both male and female diagnosed as COPD in the Stage of I and II & taking treatment since 2 years. Subjects also with co-morbid illness DM & HT in stable condition were included in the study.

The researcher has prepared the tool to collect baseline information about socio

demographic aspect and clinical variable. The biophysiological parameters were used as objective measurement to assess functional capacity of the lungs. It was assessed by spirometry. The researcher used standardized instrument St. George Respiratory Questionnaire [SGRQ] to assess the Quality of life. The subjects were selected by using purposive sampling technique.

Data collection procedure;

Individual informed consent was taken from the subjects after explaining the objectives, purpose, and the method of data collection. The data collection period for the main study was from February 2018 to May 2019. The participants were assured confidentiality of their response. The researcher first completed the data collection procedure for the control group and proceeded for experimental group.

During 1 visit, after establishing a good IPR with the patient, data were collected regarding the socio demographic, clinical variables of the patients for 10 mts. The researcher assessed quality of life by self administered St. George Respiratory questionnaire. Pulmonary function test was taken to assess their functional capacity of the lungs objectively before intervention. The PFT test was taken by the qualified personnel. The researcher demonstrated breathing retraining for group I and she supervised the return demonstration done by

the subjects for 20 mts. The researcher instructed the subjects to do the breathing retraining 5-10 mts/4 times a day for group I. The staff nurse also assisted the researcher to supervise the return demonstration done by the subjects. A *Booklet* was handed over to the subjects to recall and clarify the information. Through the Human Resource Department the researcher sent the intervention booklet to their whatsapp number. Pulmonary function test was taken to assess the effectiveness of interventions on 3rd and 6th month after interventions. Post test was conducted on St. George respiratory questionnaire at the end of 3rd and 6th month. The control group received hospital routine care.

Description of the intervention;

Breathing retraining techniques includes Diaphragmatic Breathing & Pursed Lip Breathing.

Goals of breathing retraining includes improve ventilation, increase the effectiveness of cough and promote airway clearance, promote relaxation and relieve stress, teach the patient how to deal with episodes of dyspnea, assisting in removal of secretions and correct abnormal breathing patterns and decrease the work of breathing. Subjects were instructed to do breathing retraining 5 times a day for 5-10 mts and also they were instructed to follow this throughout their life time.

Description of the tool;

Section	Tool	No. of Items
I	Socio- demographic variable proforma.	14
II	Clinical variable	6
III	Bio-physiological Parameters includes pulse rate, respiratory rate, oxygen saturation and PFT values includes FVC FEV1\FVC ratio, FEV1, PEF & FEF	8
IV	St. George Respiratory Questionnaire on quality of life. Symptom Domain- Activity Domain - Impact Domain -	50

Statistical analysis:

Data Analysis was carried out using SPSS Software version 16.0. The final data were summarized into percentages and analyzed by cross tabulations for different variables. The chi-square test was applied to

calculate the statistical difference between the demographic variables of patients with COPD among control group and group I before intervention and the non significant 'P' value [P>0.05] confirmed that there was no significant difference between the

experimental and control groups and the groups were almost similar and comparable. There was no significant difference between control group and group I lung function

tests. It was assessed using one way Analysis of variance F-test. Associations were assessed through odds ratio (OR) and its CI at 95%.

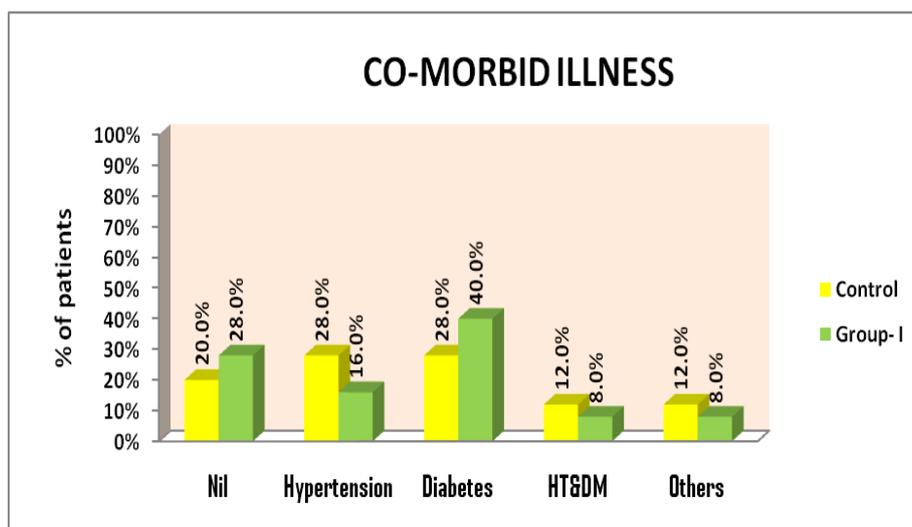
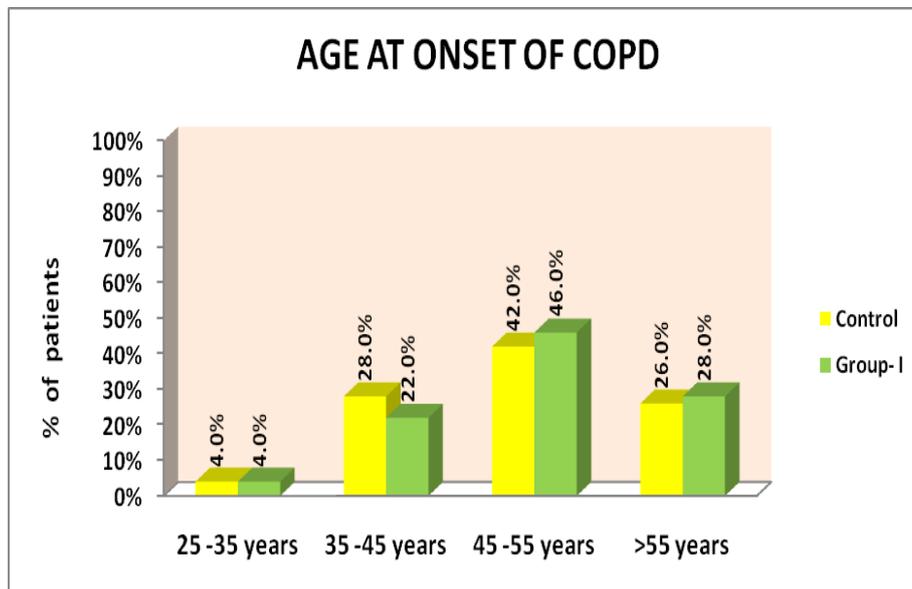


TABLE 1 ; COMPARISON MEAN LUNG FUNCTION PARAMETERS AMONG GROUP-I

Parameters	Group I						Mean Difference	One-way ANOVA F-test
	Pretest		3rd month		6th month			
	Mean	SD	Mean	SD	Mean	SD		
Pulse Rate	85.00	4.54	80.72	3.33	76.88	1.57	-8.12	F=144.88 P=0.001*** (S)
Respiratory Rate	23.72	.95	21.58	1.80	17.76	1.20	-5.96	F=169.22 P=0.001*** (S)
Oxygen saturation	89.64	.60	91.72	1.67	94.74	1.47	5.1	F=13.95 P=0.01** (S)
FVC	72.04	3.16	73.74	2.72	79.30	2.44	7.26	F=81.51 P=0.001*** (S)
FEV1	51.72	3.21	57.88	.85	62.74	4.01	9.04	F=82.87 P=0.001*** (S)
FEV1_FVC	68.86	2.06	75.92	1.45	79.42	2.59	10.56	F=104.83 P=0.001*** (S)
PEF	66.44	4.22	70.10	3.26	75.70	3.56	9.26	F=82.91 P=0.001*** (S)
FEF	65.82	5.15	67.92	4.18	70.92	1.90	5.1	F=25.97 P=0.001*** (S)

The one-way ANOVA F test revealed that there was highly significant difference in lung function parameters at the level of P=0.001*** between pretest, 3rd month and 6th month lung function tests among Group I patients.

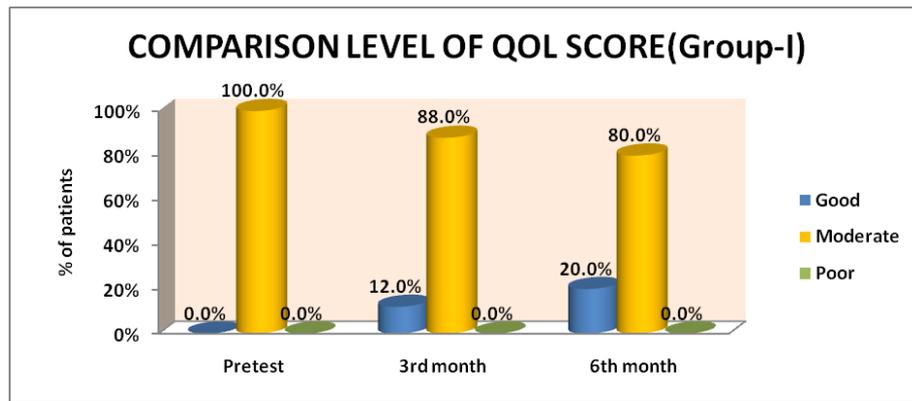


Table 2: Pre test , Post test1 and Post-test 2 QOL score among group- I patients

S.No.	Domains	Pre-test		Post-test1		Post-test 2		Mean difference	Repeated measures ANOVA F-test
		Mean	SD	Mean	SD	Mean	SD		
Group I	Symptoms	47.26	6.16	38.66	5.92	38.66	5.92	8.60	F=52.76 P=0.001*** (S)
	Activity	54.94	2.91	47.56	2.21	43.56	2.21	11.38	F=150.40 P=0.001***(S)
	Impacts	40.80	4.15	36.15	2.63	33.70	2.92	7.10	F=67.73P=0.001***(S)
	Total	47.67	2.82	40.79	2.22	38.64	2.33	9.03	F=160.76P=0.001***(S)

TABLE ;3 Comparison of pretest, 3rd month & 6th month level of QOL score among group I patients

Level of QOL	Test						McNemar's test
	Pretest		3rd month		6th month		
	N	%	N	%	N	%	
Good	0	0.0%	6	12.0%	10	20.0%	$\chi^2=10.15$ P=0.001*** DF=2S
Moderate	50	100.0%	44	88.0%	40	80.0%	
Poor	0	0.0%	0	0.0%	0	0.0%	
Total	50	100.0%	50	100.0%	50	100.0%	

Table 3 shows comparison of pretest, 3rd month & 6th month level of QOL score among group I patients. To confirm whether the difference in level of quality of life was observed among patients with COPD in group I between 3rd and 6th month were statistically significant, McNemar's test was applied. The calculated χ^2 value was 10.15. The 'p' value [0.001***] showed, the fact that increased level of quality of life was found among patients with COPD was statistically significant.

TABLE;4 Identification of influencing factors for Knowledge gain score using Multivariate logistic regression (Group I)

Influencing variables	Univariate analysis		Multivariate analysis	
	p-value	Unadjusted OR(95%CI)	p-value	Adjusted OR(95%CI)
Age(<55 years Vs ≥55 years)	0.01**	6.0(1.7 -21.3)	0.03*	3.4(1.3 -12.8)
Sex (Female Vs Male)	0.04*	3.7(1.1 -12.9)	0.05*	2.0(1.0 -7.9)
Income(>Rs.20000 Vs <Rs.10000)	0.02*	4.0(1.2 -13.6)	0.25	1.4(0.6 -18.0)
Smoking(No Vs Yes)	0.02*	4.3(1.2 -15.2)	0.03*	2.7(1.0 -8.5)
Previous knowledge (Yes Vs no)	0.01**	4.5(1.4 -15.1)	0.33	2.1(0.6 -18.6)
Severity of illness(No Vs Yes)	0.01**	8.1(2.2 -28.9)	0.03*	4.2(1.4 -16.4)

Multivariate analysis logistic regression identifies the patients in the age group of <55 years patients, female patients, non smokers and mild severity of illness patients are gained more scores than others. Adjusted odds ratio was given with 95% confidence interval.

RESULTS OF THE STUDY

The study findings revealed that

- The mean score of FEV1/FVC was found to be increased from 68.86 in the pretest to 75.92 in 3rd month and 79.42 in the 6th month
- Regarding level of quality of life among patients with COPD in group I , in pretest 100% Of them had moderate level of quality of life. At the end of 3rd month among 100%, 12% of changed to good quality of life and 88% of them remain in the moderate quality of life.

At the end of 6th month 20% of them lead good quality of life 80% of them remain in moderate quality of life

- The mean score of symptom domain was found to be decreased from 47.26 in the pretest to 38.66 in 3rd month and 38.66 in the 6th month. The mean difference was 8.60 after the intervention.
- The mean score of activity domain was found to be decreased from 54.94 in the pretest to 47.56 in 3rd month and 43.56 in the 6th month. The mean difference was 11.38 after the intervention. The mean score of impact domain was found to be decreased from 40.67 in the pretest to 36.15 in 3rd month and 33.70 in the 6th month. The mean difference was 7.10 after the intervention.
- Overall mean score of all domains was found to be decreased from 47.67 in the pretest to 40.79 in 3rd month and 38.64 in the 6th month. The mean difference was 9.03 after the intervention. To confirm whether the difference in overall domain mean score observed among patients with COPD in group I between 3rd and 6th month follow up were statistically significant, repeated measures of ANOVA F- test was applied. The calculated F ratio was 160.76. The 'p' value [0.001***] showed, the fact that reduction in overall domain score was found among patients with COPD was statistically significant.

DISCUSSION

The study findings are supported by the following studies done earlier.

Murphy [2017] identified that sixteen reviews interventions were broadly classified as education or action plans, complex interventions with an SM [Self management] focus, pulmonary rehabilitation (PR), telehealth and outreach nursing. There was strong evidence that education is associated with a significant reduction in COPD-related hospital admissions, moderate to strong evidence that telehealth interventions

and moderate evidence that complex interventions (SM focus) are associated with reduced health care utilization. There was strong evidence that education is associated with a significant reduction in COPD-related hospital admissions, moderate to strong evidence that telehealth interventions and moderate evidence that complex interventions (SM focus) are associated with reduced health care utilization. These findings from a large body of evidence suggesting that SM, through education or as a component of PR, confers significant health gains in people with COPD in terms of HRQoL.

CONCLUSION

COPD impairs quality of life, by preventing people with the condition from socializing and enjoying their hobbies. The Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines have identified the goals of treatment for patients with COPD, these include the patients' goals of improved exercise tolerance and emotional function (health-related quality of life) and also important clinical goals such as prevention of disease progression and minimization of symptoms .

The nurses are in a key position to assess the quality of life among patients with COPD and to assist them to identify factors deteriorating their health and implement such breathing retraining programme that can prevent the negative consequences of on their health. Patient education is "a two way process-that of teaching by the nurse, and learning by the patient, with the purpose of achieving a specific goal, that is optimum health" (Mary Deyirmenjian, 2004).

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