Research Article Available online www.ijsrr.org ISSN: 2279–0543

International Journal of Scientific Research and Reviews

A Study to Assess the Effect of Breathing Exercises on Pulmonary Function among Patients with COPD at Selected Hospitals in Jaipur

Tyagi Hemant*, Sharma Bhartendra and Soni Giriraj Prasad

Mahatma Gandhi Nursing College, Sitapura, Jaipur, (Raj.) India
Email id: tyagihemant2021@gmail.com

ABSTRACT

Breathing exercise is a specific type of controlled breathing in the practice of yoga. At starting time hold &closed one nostril by your left hand finger while taking breath inside than hold & closed right nostril by the right hand while exhaling. The process is then reversed mode and repeated two to five time.This method is very effective in various point in physical and psychological way such as stress and ventilate good breath and maintain breathing circulation.

Quantitative research approach used in this study with a true experimental design. Setting of the study was Jaipur Hospital & Indus Jaipur Hospital, Jaipur & Target population patient with COPD, probability sampling techniques was used in this study and sample size 200 COPD patients.

Data were present in tabular and graphical representation, Paired t-test were used to compare the treatment effect of pulmonary function on control and experimental group. In control group, FIV, PEFR, Oxygen saturation were significant chest expansion is highly significant and BHT were not significant but in experiment group all pulmonary function is highly significant it means the treatment is effective for pulmonary function.

KEYWORDS: Assess, Effect of Breathing Exercises, Pulmonary Function, COPD

***Corresponding Author:-**

Hemant Tyagi

PHD Scholar, Mahatma Gandhi Nursing College,
Sitapura, Jaipur (Raj.) India
Email id: tyagihemant2021@gmail.com

INTRODUCTION:

Smoking is considered as an acute exacerbations and it is contributory factor in the development of COPD[1].

This is to know that acute moderate exacerbations are associated with an accelerated decline in forced expiratory volume in one second or more and impairment of functional and clinical outcomes in ex-smoking chronic obstructive pulmonary patients.[2]

Use of breathing exercise in proper manner will improve pulmonary function, exercise tolerance and maintain quality of life. Breathing with an expiratory resistive load, which is a method of modulating spontaneous breathing against PEEPI, has not been fully studied in patients with COPD.[3]

Pulmonary rehabilitation improves exercise capacity, symptoms, and quality of life in chronic obstructive pulmonary disease (COPD) patients, and is therefore recommended in all stages of the disease. However, there are insufficient data on patients with very severe disease.[4]

COPD is a severe indisposes pathology. Inspiratory and/or expiratory muscle training may favourably impact the indicators of both specific and general improvement with regard to this disease. We are hypothesizing that when combined with bronchial decluttering, this training will have a beneficial effect on lung function and quality of life in these patients.[5]

Smoking is a major risk factor for chronic obstructive pulmonary disease (COPD); however, the similarities and differences in clinical presentation between smokers and non-smokers are not fully described in patients with COPD.[6]

COPD revealed by an incompletely reversible in the airflow.A physiological variable--the forced expiratory volume in one second (FEV1)--is often used to grade the severity of COPD. We hypothesized that a multidimensional grading system that assessed the respiratory and systemic expressions of COPD would better categorize and predict outcome in these patients.[7]

A study conducted on prevalence and medical costs of noncommunicable chronic diseases among adult Medicaid beneficiaries to inform future program design.The databases MEDLINE and CINAHL were searched in August 2016 using keywords, including Medicaid, health status, and healthcare cost, to identify original studies that were published during 2000-2016, examined Medicaid as an independent population group, examined prevalence or medical costs of chronic conditions. These

findings could help inform the evaluation of interventions to prevent and manage non-communicable chronic diseases and their potential to control costs among the vulnerable Medicaid population.[8]

Giacomini M, et al.In July 2010, the Medical Advisory Secretariat work on a COPDevidenced based framework, an evidence-based review of the surrounding treatment for patients with COPD. The Chronic Obstructive Pulmonary Disease Mega-Analysis series is made up of the following reports, which can be Qualitative empirical studies (from social sciences, clinical, and related fields) can offer important information about how patients experience their condition. This exploration of the qualitative literature offers insights into patients' perspectives on COPD, their needs, and how interventions might affect their experiences. The experiences of caregivers are also explored. Patients typically seek initial treatment for an acute episode rather than for chronic early symptoms of COPD. Many patients initially misunderstand terms such as COPD, chronic obstructive pulmonary disease, or exacerbation. Patients may not realize that COPD is incurable and fatal; some physicians themselves do not consider early COPD to be a fatal disease.[9]

A study developed an evidence-based guideline development and is in accordance with the principles of the Grading of Recommendations Assessment, Development and Evaluation (GRADE) Working Group. On the basis of moderate-quality evidence, we found a clinically and statistically significant improvement in short-term HRQoL of 4.2 units (95% confidence interval [CI]: [-4.51 to -3.89]) on St George's Respiratory Questionnaire, but not at the longest follow-up. It is found in statistically significant of 25.71 after 6 minutes walking test with PR; however, this improvement was not considered clinically relevant. No difference was found for mortality, and insufficient data prohibited meta-analysis for muscle strength and maximal exercise capacity. We found a moderate quality of evidence suggesting a small, significant improvement in short-term HRQoL and a clinically no significant improvement in walking distance following PR in patients with COPD and mild symptoms.[10]

de-Miguel-Diez J et l. to examine the incidence, clinical characteristics, and in-hospital outcomes of pulmonary embolism (PE) among hospitalized patients with or without chronic obstructive pulmonary disease (COPD) in Spain, and to identify predictors of in-hospital-mortality (IHM) after PE among patients with and without COPD.We included all patients aged ≥ 40 years who were hospitalized for PE between 2016 and 2018. Data were collected from the Spanish National Hospital Discharge

Database. Predictor factors of IHM in COPD patients with PE included older age, higher Charlson comorbidity index, atrial fibrillation, massive PE and dependence on oxygen prior to hospital admission. However, obesity was associated with lower IHM. For PE hospitalized patients, suffering COPD increased the probability of dying in the hospital . Our results revealed that incidence of PE were higher in COPD patients than in those without COPD. After PE COPD was a more risk for IHM. Study conducted on Incidence, comorbidities, diagnostic and therapeutic procedures, for the lengthy stay in the hospital, readmissions rate, costs and in hospital mortality was analyzed as per the patient condition. Charlson comorbidity index was used to check comorbidity.[11]

After assess the condition it is known that 1,501,811 admissions for HF. It's found that higher rate of COPD patients for the complete year. COPD increase significantly after a few times in the both group of patients. In the COPD patient it is 2.42 higher among COPD patients. It is shown that IHM significantly decrease in both group Due to COPD was not associated with a higher IHM in patients hospitalized with HF. Among men suffering COPD the incidence of HF hospitalizations increased from 2001 to 2015.[12]

OBJECTIVE

- To assess the pulmonary functions on patients with COPD before Breathing exercise in experimental and control group.
- To assess the pulmonary functions after breathing exercise on patient with COPD in experimental and control group.
- To compare the pulmonary functions between the experimental and control group before and after breathing exercise.
- To associate the pulmonary function of patient COPD with their selected demographic variables in experimental group.

ASSUMPTIONS: The study assumes that**,**

- Reinforcement concepts of Breathing exercise enriches learning and leads to modification one's behavior
- Participatory care will improve self-esteem towards the promotion of health.

- Breathing exercise will increase positive effect on pulmonary function of the patients with COPD during inspiration and expiration

HYPOTHESES

H1 There will be significant difference in the pulmonary functions among patient with COPD who receive breathing exercises than those who donot receive at 0.05 level of Significance assessed by inspiratory volume, (FIV) peak expiratory flow rate (PEFR), Oxygen saturation, Chestexpansion and Breathing holding time.

H2 There will be significant association between the post-test pulmonary functions scores of Patients with COPD in experimental and control group and selected demographic variables.

MATERIAL & METHODS:

Research Approach:

The research approach will be used in this study is Quantitative Research Approach

Research Design:

A true experimental design, which includes Manipulation, Control, **Randomization** (Pre test- Post test with control group)

Research Setting: Imperial Hospital Jaipur

Target: All the patients admitted with COPDin selectedHospital of Jaipur.

Accessible: Available at the time of data collection.

Samples: The patients who fulfilled the inclusive and exclusive criteria are the samples.

Sampling Technique: Probability sampling simple random technique was used by lottery method.

Sample Size:

The data will be collected from 200 COPD patients at selected Hospital Jaipur

Data Collection Method

The Data Collection was divided into part-I, Part-II and part III Observation checklist for the level of participation in breathing exercises.

RESULTS:

Table no 1 Comparing before and after effect protocol assessment of control group

Variable	Before	After	Paired t - test	P - Value	Significance
FIV	675.3 ± 69.8	694.4 ± 72.1	-1.862	0.032877	**Significant**
PEFR	239.5 ± 22.95	245.2 ± 19.7	-2.121	0.018214	
Oxygen saturation	77.17 ± 5.65	78.8 ± 4.61	-2.349	0.010412	
Chest expansion	3.29 ± 0.19	3.66 ± 0.26	-12.81	0.000001	**Highly significant**
BHT	11.26 ± 3.95	11.91 ± 4.21	-1.354	0.089468	**Not significant**

It is evident from the above table (14) that in the pre test out of 200 subjects Paired t – test was used to Comparing before and after effect protocol assessment of control group found that in the FIV assessment in the pre test score of FIV 675.3 and in the post test score found 694.4. FIV score was minor changes in the after the treatment and it's found significant, PEFR assessment in the pre test score of 239.5 and in the post test score found 245.2. PEFR score was minor changes in the post test control group and it's found significant, Oxygen saturation assessment in the pre test score of 77.17 and in the post test score found 78.8. Oxygen saturation score was minor changes in the post test control group and it's found significant, Chest expansion in the pre test score of 3.29 and in the post test score found 3.66. Chest expansion score was minor changes in the post test control group and it's found highly significant, BHT score in the pre test were 11.26 and post test were 11.91 and found no significant after comparison in the both group.

Table 2: Comparing before and after effect of protocol assessment of treatment group

Variable	Before	After	Paired t - test	P - Value	Significance
FIV	709.5 ± 40.85	1096.8 ± 65.12	-57.31	0.000001	**All are highly significant**
PEFR	251.6 ± 35.24	446.9 ± 117.5	-16.22	0.000001	
Oxygen saturation	77.3 ± 3.48	93.55 ± 2.61	-38.42	0.000001	
Chest expansion	3.47 ± 0.22	5.43 ± 0.57	-33.93	0.000001	
BHT	13.48 ± 5.56	36.26 ± 6.69	-30.24	0.000001	

Table 3: Comparing change in value of different parameters between before and after of control and treatment group

Variable	Control	Experimental	t - test	P - Value	Significance
FIV	19.1 ± 102.5	387.3 ± 67.58	-29.99	0.000001	**All are highly significant**
PEFR	5.65 ± 26.64	195.3 ± 120.4	-15.38	0.000001	
Oxygen saturation	1.61 ± 6.86	16.25 ± 4.23	-18.176	0.000001	
Chest expansion	0.37 ± 0.29	1.96 ± 0.58	-24.61	0.000001	
BHT	0.65 ± 4.79	22.78 ± 7.53	-24.77	0.000001	

Table 4: Comparing between before and after effect of breathing exercise of control group

Variable	Before	After	Paired t-test	P - Value	Significance
Alternative Nostrils exercise	6.04 ± 2.65	7.56 ± 1.13	-5.499	0.000001	**Highly significant**
Diaphragmatic exercise	5.2 ± 1.87	5.28 ± 1.82	-1.21	0.22961	Not significant
Purse lip exercise	5.28 ± 1.34	6.3 ± 0.91	-5.78	0.000001	**Highly significant**

Table 5: Comparing between before and after effect of breathing exercise of treatment group

Variable	Before	After	Paired t-test	P - Value	Significance
Alternative Nostrils exercise	5.6 ± 1.42	11.62 ± 0.814	-38.89	0.000001	**All are significant**
Diaphragmatic exercise	5.3 ± 1.034	11.9 ± 0.795	-46.79	0.000001	
Purse lip exercise	5.08 ± 1.01	11.2 ± 1.84	-28.25	0.000001	

Table 6: Comparing change in value of different in breathing exercise parameters between before and after of control and treatment group

Variable	Control Group	Experimental Group	t- test	P - Value	Significance
Alternative Nostrils exercise	1.52 ± 2.77	6.02 ± 1.59	-14.11	0.000001	**All are significant**
Diaphragmatic exercise	0.08 ± 0.66	6.56 ± 1.4	-41.79	0.000001	
Purse lip exercise	1.02 ± 1.76	6.12 ± 2.17	-18.26	0.000001	

Statistical analysis:

Data were present in tabular and graphical representation, Paired t-test were used to compare the treatment effect of pulmonary function on control and experimental group. In control group, FIV, PEFR, Oxygen saturation were significant chest expansion is highly significant and BHT were not significant but in experiment group all pulmonary function is highly significant it means the treatment is effective for pulmonary function. Also checked the treatment effect on breathing exercise and it is found highly significant in all parameters of experiment group. Student's t-test were used to compare the value changes after treatment between control and experiment group for pulmonary function and breathing exercise and its found highly significant, it means score changes after treatment in experimental group is high as compared to control group for both pulmonary function and breathing exercise.

DISCUSSION:

It was aimed at the improvement in knowledge of patients, so that they can predict the risk of COPD. Probability Sampling Techniques was used to select sample of 200patients of Indus Hospital & Jaipur Hospital at Jaipur. The study was conducted over a period of 4 weeks from November 01 2021 to December 01, 2021.

Chronic obstructive pulmonary disease is a serious lung disease for individuals in middle age and especially in old people & it reduce the its seriousness by doing the breathing exercise in continues routine schedule. Breathing exercise is improving the patient condition if regular exercise carried out by the patients.

CONCLUSION:

In the present study 200 patients were selected from Indus Hospital& Jaipur Hospital, using Probability Sampling Techniques. The research approach adapted to this study is Quantitative Research Approach.

Analysis showed that self-management programmes can provide a significant benefit to COPD patients in terms of exercise capacity and some aspects of their self-efficacy. Adherence to a written action plan can reduce exacerbation recovery time by enabling prompt awareness of symptom& breathing exercise.

REFERENCES: -

01. https://www.healthline.com/health/anulom-vilom-pranayama
02. Jorge D , Orlando D , Paula B R , Arturo M, Do frequent moderate exacerbations contribute to progression of chronic obstructive pulmonary disease in patients who are ex-smokers, Observational StudyInt J Chron Obstruct Pulmon Dis 2015 Mar 10;10:525-33.
03. TimmG, Andreas RK, Christoph N, Katharina K, Effect of a Three-Week Inpatient Rehabilitation Program on 544 Consecutive Patients with Very Severe COPD, A Retrospective Analysis , 2015;90(4):287-92.
04. Timm G , Andreas R K, Christoph N, Katharina K, Effect of a Three-Week Inpatient Rehabilitation Program on 544 Consecutive Patients with Very Severe COPD: A Retrospective Analysis, Respiration . 2015;90(4):287-92.
05. Tout R , Tayara L, HalimiM,The effects of respiratory muscle training on improvement of the internal and external thoraco-pulmonary respiratory mechanism in COPD patients, Controlled Clinical TrialAnn Phys Rehabil Med . 2013 Apr; 56(3):193-211
06. Jing Z , Xin-F L , Chun-xue B, Comparison of clinical features between non-smokers with COPD and smokers with COPD: a retrospective observational study, Observational Study, Int J Chron Obstruct Pulmon Dis 2014;9:57-63.

07. Bartolome R C , Claudia G C, Jose MM, Ciro C, The body-mass index, airflow obstruction, dyspnea, and exercise capacity index in chronic obstructive pulmonary disease, N Engl J Med . 2004 Mar 4;350(10):1005-12.
08. Chapel JM, Ritchey MD, Zhang D, Wang G. Prevalence and Medical Costs of Chronic Diseases Among Adult Medicaid Beneficiaries. Am J Prev Med. 2017 Dec;53(6S2):S143-S154.
09. Giacomini M, DeJean D, Simeonov D, Smith A. Experiences of living and dying with COPD: a systematic review and synthesis of the qualitative empirical literature.Ont Health Technol Assess Ser. 2012;12(13):1-47. Epub 2012 Mar 1.
10. Rugbjerg M, Iepsen UW, Jørgensen KJ, Lange P.Effectiveness of pulmonary rehabilitation in COPD with mild symptoms: a systematic review with meta-analyses. Int J Chron Obstruct Pulmon Dis. 2015 Apr 17; 10:791-801.
11. de-Miguel-Diez J, Albaladejo-Vicente R, Jiménez-García R, Hernandez-Barrera V, Villanueva-Orbaiz R, Carabantes-Alarcon D, Jimenez D, Monreal M, López-de-Andrés A. The effect of COPD on the incidence and mortality of hospitalized patients with pulmonary embolism: A nationwide population-based study (2016-2018). Eur J Intern Med. 2021 Feb; 84:18-23.
12. de Miguel-Díez J, López-de-Andrés A, Hernández-Barrera V, de Miguel-Yanes JM, Méndez-Bailón M, Muñoz-Rivas N, Jiménez-García R. Influence of COPD on outcomes of patients hospitalized with heart failure: Analysis of the Spanish National Hospital Discharge Database (2001-2015). Int J Cardiol. 2018 Oct 15; 269:213-219.