



ISSN: 2230-9926

Available online at <http://www.journalijdr.com>

IJDR

International Journal of Development Research
Vol. 16 Issue, 01, pp. 69873-69876, January, 2026
<https://doi.org/10.37118/ijdr.30505.01.2026>



RESEARCH ARTICLE

OPEN ACCESS

EVALUATION OF THE PULMONARY FUNCTIONAL PARAMETERS IN PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE IN A SELECTED HOSPITAL IN NAVSARI: THE IMPACT OF AN INTERVENTIONAL PACKAGE

¹Mr. Bhuvnesh Pnadya and ²Dalal Shahin Mahaiyuddin

¹Vice Principal S. S. Agrawal College of Nursing, Training College & Research Centre, Navsari

²PhD scholar, P P Savani School of Nursin, P P Savani University Gujarat- India

ARTICLE INFO

Article History:

Received 17th October, 2025
Received in revised form
28th November, 2025
Accepted 16th December, 2025
Published online 30th January, 2026

Key Words:

COPD, Dyspnea, The Modified Dyspnea Borg Scale (MDBS), Deep Breathing Exercise.

*Corresponding author:

Mr. Bhuvnesh Pnadya

ABSTRACT

Background: The general population has a high prevalence of chronic obstructive pulmonary disease. It is a slowly developing illness that obstructs airflow by affecting the pulmonary parenchyma or airways. COPD symptoms include dyspnea and a persistent cough that may or may not produce phlegm. Patients with COPD showed improved health and increased exercise tolerance after receiving an intervention package that included deep breathing exercises and education. **Objectives:** Determining the impact of an interventional package on lung functional measures in individuals with chronic obstructive pulmonary disease in the experimental group was the primary goal of the study. **Materials and Methods:** A quasi-experimental two-group pretest-posttest research design was used. A sample of 60 COPD patients (30 in experimental groups and 30 in control groups) was obtained using the purposeful sampling technique. Pulmonary functional parameters were used for pretest and posttest evaluation. The experimental group received two cycles of deep breathing exercises every day, whereas the control group received no intervention. The interventional package, which included an instructional phase, was given for twenty to twenty five minutes per day. On day tenth following the intervention, a post-test was administered to both the experimental and control groups. **Result:** The Modified Dyspnea Borg Scale (MDBS) scores revealed improvements in the experimental group post-intervention. In the experimental group, mild dyspnea increased from 6.66% (pre-test) to 10% (post-test), while severe dyspnea decreased from 23.33% to 3.33%. In contrast, the control group showed minimal changes. This suggests the interventional package positively impacted dyspnea levels in COPD patients. The spirometer results showed improved lung function in the experimental group post-intervention. In the experimental group, moderate impairment decreased from 30% (pre-test) to 16.66% (post-test), and severe impairment decreased from 20% to 13.33%. Mild impairment increased from 0% to 6.66%, indicating some patients shifted from moderate/severe categories. The control group showed minimal changes.

Copyright©2026, Mr. Bhuvnesh Pnadya and Dalal Shahin Mahaiyuddin. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Mr. Bhuvnesh Pnadya and Dalal Shahin Mahaiyuddin. 2026. "Evaluation of the Pulmonary Functional Parameters in Patients with chronic obstructive pulmonary disease in a selected hospital in navsari: The impact of an interventional package". *International Journal of Development Research*, 16, (01), 69873-69876.

INTRODUCTION

One of the main causes of illness in the world is chronic obstructive pulmonary disease. One of the most upsetting illnesses that negatively impacts people's lives is COPD. Restricted airflow and an aberrant inflammatory response in the lungs are the disease's hallmarks. People with severe respiratory diseases are reminded every six seconds that their breathing is compromised, their activities are limited, and they may not survive as long as they once did. According to recent research by Yiting Li et. al (2022) in China revealed that breathing exercises can greatly enhance the quality of life and pulmonary function metrics for people with chronic obstructive pulmonary disease (COPD). Breathing exercises enhanced exercise endurance, lung function, and quality of life in COPD patients, according to a systematic evaluation of seven trials. Diaphragmatic breathing and pursed-lip breathing exercises enhanced inspiratory muscle strength, functional capacity, and decreased dyspnea.

Significant gains in lung function, exercise capacity, and general quality of life were also demonstrated by home-based pulmonary rehabilitation in conjunction with non-invasive positive pressure ventilation.

Objectives

- To assess the pulmonary functional parameters among patients with COPD before interventions.
- To assess the pulmonary functional parameters among patients with COPD after interventions.

MATERIALS AND METHODS

A quantitative research approach was adopted to evaluate the effectiveness of an interventional package on pulmonary functional parameters among patients with Chronic Obstructive Pulmonary

Disease (COPD). The study employed a quasi-experimental two-group pre-test post-test design, conducted at selected hospital of Navsari District- Gujarat, from October to December (3 months). The dependent variable, pulmonary functional parameters, was assessed using the Modified Dyspnea Borg Scale. The independent variable, an interventional package consisting of an educational phase and deep breathing exercises, was administered to 30 COPD patients selected through purposive sampling. The study aimed to determine the impact of this interventional package on improving pulmonary function among COPD patients. The study included COPD patients experiencing breathing difficulty and expectoration, while excluding those with other chronic illnesses or on respiratory supportive devices (except oxygen therapy). This selective approach aimed to assess the interventional package's effectiveness on pulmonary functional parameters in a relatively homogeneous COPD population.

RESULTS

There are four sections in the Result:

Section A: Demographic Factors

Section B: The Modified Dyspnoea Borg scale, which is used to gauge the degree of dyspnea in COPD patients

Section C: This section discusses inspiratory and expiratory capacity using a spirometer, which assesses the lungs' functional capacity in COPD patients.

Section D: In order to determine whether a person is capable of holding their breath for a specific amount of time, this section discusses breath holding time using a stop clock.

Methods of Statistics: Descriptive and inferential statistics were used to analyze the data.

The distribution of study subjects' numbers and percentages based on their demographic characteristics is shown in the above table. Out of the 15 samples in the experimental group, 13.33% were between the ages of 30 and 40, 26.66% were between the ages of 41 and 50, and 60% were between the ages of 51 and 60. Gender-wise, the experimental group consisted of 53.33% females and 46.66% males. In terms of occupation, 73.33% of workers were sedentary, whereas 4% belonged to the non-sedentary category. In terms of family structure, 40% belonged to joint families and 60% to nuclear families. Regarding smoking history, 33.33% of the experimental group smoked, whereas 66.66% did not. The Modified Dyspnea Borg Scale (MDBS) scores revealed improvements in the experimental group post-intervention. In the experimental group, mild dyspnea increased from 6.66% (pre-test) to 10% (post-test), while severe dyspnea decreased from 23.33% to 3.33%.

Table 1. Percentage Distribution of study subjects According to Demographic variables

Demographicvariable	Experimentalgroup		Controlgroup	
	Frequency (f)	Percentage (%)	Frequency (f)	Percentage (%)
Age				
30-40Years	2	13.33	0	0
41-50Years	4	26.66	3	20
51-60Years	9	60	12	80
Gender				
Male	7	46.66	9	60
Female	8	53.33	6	40
Occupation				
Sedentary	11	73.33	12	80
Non-sedentary	4	26.66	3	20
Typeoffamily				
Nuclear	9	60	13	86.66
Joint	6	40	2	13.33
Historyof smoking				
Yes	5	33.33	8	53.33
No	10	66.66	7	46.66
Familyhistory				
Allergy	7	46.66	9	60
Lungdisease	4	26.66	2	13.33
Heart disease	4	26.66	4	26.66

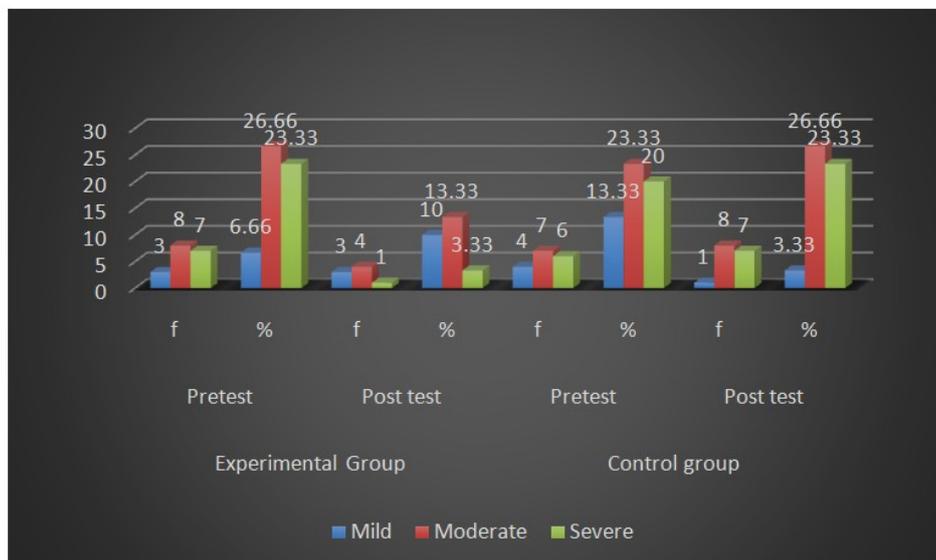


Figure 1. Pre test and post test level of dyspnoea by using modified dyspnoea borg scale in both experimental and control group N=30

In contrast, the control group showed minimal changes: mild dyspnea decreased from 13.33% to 3.33%, and severe dyspnea remained relatively stable (20% to 23.33%). This suggests the interventional package positively impacted dyspnealevels in COPD patients.

This suggests the interventional package positively impacted breath holding time in COPD patients. Figure 3 shows the comparison of mean, standard deviation in experimental and control group. In the experimental group the mean post test level of dyspnea was 3.27 with

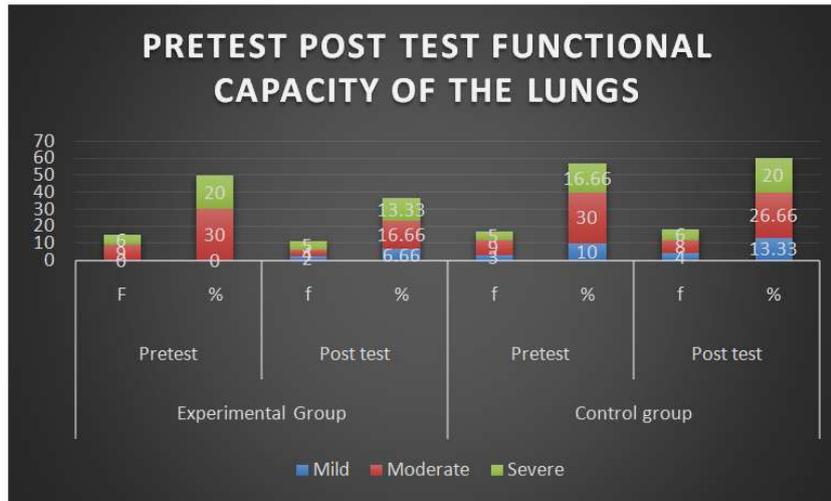


Figure 2. Pretest and posttest functional capacity of the lungs in both experimental and control group N=30

Table 2. Pretest and posttest level of measurement of breath holding time in both experimental and control group N=30

Breath holding time	Experimental Group				Control group			
	Pretest		Posttest		Pretest		Posttest	
	f	%	f	%	f	%	f	%
Mild	0	0	7	23.33	0	0	0	0
Moderate	8	53.33	5	16.66	8	53.33	9	30
Severe	7	46.66	3	10	7	46.66	6	20

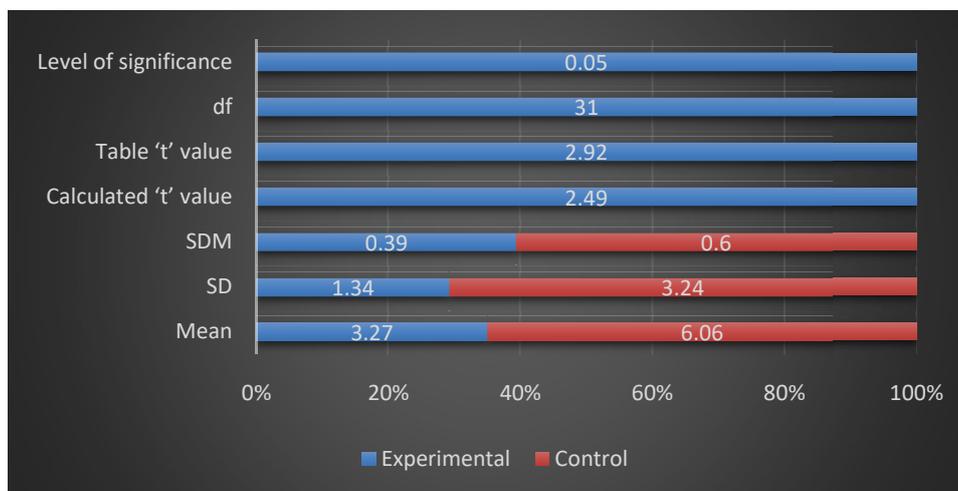


Figure 3. Comparison of mean, standard deviation of posttest level of dyspnea experimental and control group N=30

Figure 2 reveals the spirometer results showed improved lung function in the experimental group post-intervention. In the experimental group, moderate impairment decreased from 30% (pre-test) to 16.66% (post-test), and severe impairment decreased from 20% to 13.33%. Mild impairment increased from 0% to 6.66%, indicating some patients shifted from moderate/severe categories. The control group showed minimal changes: mild impairment increased from 10% to 13.33%, and severe impairment remained relatively stable (16.66% to 20%). This suggests the interventional package positively impacted lung function in COPD patients. The breath holding time assessment showed improvements in the experimental group post-intervention. In the experimental group, mild impairment increased from 0% (pre-test) to 23.33% (post-test), while severe impairment decreased from 46.66% to 10%. Moderate impairment decreased from 53.33% to 16.66%. In contrast, the control group showed different trends: moderate impairment decreased from 53.33% to 30%, and severe impairment increased from 46.66% to 70%.

standard deviation 1.34 and in the control group was 6.06 with SD 2.49. The calculated 't' value was -2.49, which is less than the table value which is 2.92 at 0.05 level. The post-test lung function assessment via spirometer showed a significant difference between the experimental and control groups. The experimental group had a higher mean score (3.52) compared to the control group (4.08). With a calculated 't' value of 5.5, exceeding the table 't' value of 2.88 at 26 degrees of freedom and 0.05 significance level, the difference is statistically significant. This indicates the interventional package had a positive impact on lung function in COPD patients. The post-test breath holding time comparison showed a significant difference between the experimental and control groups. The experimental group had a slightly higher mean score (1.07) compared to the control group (1.01). With a calculated 't' value of 3.81, exceeding the table 't' value of 2.63 at 27 degrees of freedom and 0.05 significance level, the difference is statistically significant. This indicates the interventional package had a positive impact on breath holding time in COPD patients.

Table 3. Comparison of mean, standard deviation of posttest levelling functioning by spirometer on experimental and control group N=30

Group	Mean	SD	SDM	Calculated 't' value	Table 't' value	df	Level of significance
Experimental	3.52	2.40	0.62	5.5	2.88	26	0.05
Control	4.08	2.29	0.59				

Table 4. Comparison of mean, standard deviation of posttest level of breath holding time on experimental and control group N=30

Group	Mean	SD	SDM	Calculated 't' value	Table 't' value	df	Level of significance
Experimental	1.07	0.27	0.07	3.81	2.63	27	0.05
Control	1.01	0.23	0.05				

CONCLUSION

The interventional package comprising an educational phase and deep breathing exercises proved effective in enhancing pulmonary functional parameters among COPD patients at the selected hospital in Navsari. Significant improvements were observed in dyspnea levels, lung function (assessed via spirometer), and breath holding time. The experimental group showed notable reductions in severe dyspnea (from 23.33% to 3.33%) and improvements in lung function. Statistical analysis confirmed these differences were significant ($p < 0.05$), indicating the package's potential to positively impact COPD management and patients' quality of life. The study demonstrates the effectiveness of the interventional package in improving pulmonary functional parameters among COPD patients at the selected hospital in Navsari. Significant improvements were observed in dyspnea levels, lung function (via spirometer), and breath holding time in the experimental group compared to the control group. Statistical analysis confirmed these differences were significant ($p < 0.05$). The findings suggest that incorporating educational phases and deep breathing exercises can positively impact COPD management, potentially enhancing patients' quality of life.

REFERENCES

- Afonso ASM, et al. Awareness about COPD in primary health care clinics. 2011.
- Barnett S. Genetic factors contributing to the development of COPD. 2012.
- Basavanthappa BT. Nursing Research. 2nded. New Delhi: Jaypee Brothers Medical Publishers; 2006.p.72- 78.
- Black MJ, Hawks JH, Keen AM. Medical Surgical Nursing: Clinical Management for Positive Outcomes. 9th ed. Philadelphia: WB Saunders Company.
- COPD articles. The New England Journal of Medicine. 2015;613-673.
- COPD Exacerbations: AJN The American Journal of Nursing. 2015; 188-207.
- Global Initiative for Chronic Obstructive Lung Disease. Pocket Guide to COPD Diagnosis, Management and Prevention. 2010. *International Journal of COPD*. 2015; Volume2015:1178-2005.
- Neder JA, Milne KM, Berton DC, de-Torres JP, Jensen D, Tan WC, et al. Exercise tolerance according to the definition of airflow obstruction in smokers *Am J Respir Crit Care Med*. 2020 202, 760: 2.
- Salvi SS, Barnes PJ Chronic obstructive pulmonary disease in non-smokers *Lancet* 2009, 374733:43 *The European Respiratory Journal*. Nov 2011; 1222- 1232.
