International Journal of Advance Research in Medical Surgical Nursing

E-ISSN: 2663-2268
P-ISSN: 2663-225X
www.surgicalnursingjournal.com
IJARMSN 2025; 7(2): 123-125
Received: 24-07-2025
Accepted: 28-08-2025

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A study to evaluate the effectiveness of nursing intervention package on dyspnea among patients with chronic obstructive pulmonary disease admitted at NMCH, Rohtas, Bihar

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DOI: https://www.doi.org/10.33545/surgicalnursing.2025.v7.i2b.278

Abstract
Background: Chronic Obstructive Pulmonary Disease (COPD) is a progressive condition often resulting in persistent dyspnea, adversely impacting quality of life. Non-pharmacological interventions are important for symptom management.
Aim: To evaluate the effectiveness of a structured nursing intervention package on dyspnea among COPD patients admitted at NMCH, Rohtas, Bihar.
Need for the study: In 2021, Chronic Obstructive Pulmonary Disease (COPD) affected approximately 213.39 million people globally, with an age-standardized prevalence rate of 2,512.86 per 100,000 population. This reflects a slight decrease of 1.46% since 1990, indicating relative stability in global prevalence when adjusted for age. However, the overall number of cases has increased, mainly due to population growth and aging. The global death toll from COPD in 2021 was 3.72 million, but the age-standardized mortality rate decreased significantly by 37.12% compared to 1990.
Objectives
- To assess and compare the pre-test level of dyspnea among patient with COPD between the study group and control group.
- To assess and compare the post-test level of dyspnea among patient with COPD between the study group and control group.
- To determine the effectiveness of Nursing intervention package on dyspnea among patient with COPD in the study group.
- To associate the pre-test and Post-test level of dyspnea among patient with COPD in the study and control group with their demographical variables.

Hypotheses
- **RH_1:** There will be a significant difference in the pre-test level of dyspnea among patient with COPD between the study and control group.
- **RH_2:** There will be a significant difference in the post test level of dyspnea among patient with COPD between the study and control group.
- **RH_3:** There will be a significant difference in the pre-test and post-test level of dyspnea among patient with COPD in study group.
- **RH_4**: There will be a significant association of pre-test and post-test level of dyspnea among patient with COPD with their socio demographical variable in the study and the control group.

Design: Quasi-experimental, non-randomized control group
Sample: 60 COPD patients (30 per group), purposive sampling
Intervention: Pursed-lip breathing, diaphragmatic breathing, patient education
Analysis: Standard dyspnea scale, statistical comparison between and within groups
Results: Significant reduction in dyspnea in the study group post-intervention ($p<0.05$); no significant change in the control group
Conclusion: The intervention package effectively reduced dyspnea and can improve quality of life if routinely integrated.

Keywords: Nursing intervention for dyspnea, COPD patients

Introduction
COPD remains a major and growing public health challenge globally and in India, with high prevalence and mortality rates, especially in under-resourced regions like Bihar. Multiple risk factors-smoking, indoor and outdoor air pollution, and poor healthcare infrastructure-contribute to disease burden. Managing dyspnea is critical for improving patient well-being.

Methodology

- **Design:** True experimental, pre-test/post-test control group approach
- **Setting:** Narayan Medical College and Hospital (NMCH), Jamuhar, Sasaram, Bihar
- **Population:** All COPD patients with dyspnea admitted at NMCH during the study
- **Sample**: 60 patients (30 experimental, 30 control), selected using simple random sampling
- **Inclusion Criteria:** COPD patients willing to participate and able to understand Hindi or English
- **Exclusion Criteria:** Very ill, those with cardiac disorders, or unable to cooperate
- **Tool**: Medical Research Council (MRC) Dyspnea Scale (standardized 5-point scale)

Intervention (Experimental group)

Conceptual Framework

Based on Roy's Adaptation Model: Focus on individual adaptation to dyspnea as a physiological and psychosocial challenge Nursing interventions as stimuli fostering adaptive responses (improved oxygenation, coping, support) Interventions target physiological, self-concept, and interdependence modes, resulting in adaptation and reduced dyspnea impact.

Results

Pre-test dyspnea: Groups were statistically similar (mean ~2.83-2.97, no significant difference; $p>0.05$).

Post-test dyspnea: Experimental group mean = 1.07 (SD 0.828), control group mean = 3.00 (SD 0.830), t = -9.032, p = 0.001 80% of the study group had no or only slight dyspnea post-test, compared to severe or very severe dyspnea in most controls.

Significant association between demographic variables (sex, income, diet) and pre-test dyspnea; no association post-test.

Intervention demonstrated strong statistical and clinical effectiveness in reducing dyspnea.

Compression of pre-test and post-test Mean & S.D level of dyspnea among patient with COPD study group and control group.

Table 1: Paired Sample t-Test Analysis of Pre-test and Post-test Scores

Paired Samples Statistics					Paired Sample Test			
	Mean	Mean difference	N	Std. Deviation	t	df	P value	Correlation
Pre- test Post- test	2.83	1.767	30	.791	8.102	29	.000	-.088
	1.07		30	.828				

The mean pre-test dyspnea score in the study group was 2.83, while the mean post- test score dropped to 1.07, resulting in a mean difference of 1.767. A paired t-test was conducted to evaluate the significance of this change. The test yielded a t-value of 8.102, with 29 degrees of freedom and a p-value of 0.000, indicating a highly significant improvement. The standard deviation was 0.791 for the pre-test and 0.828 for the post- test. These results clearly demonstrate that the nursing intervention package had a statistically significant positive impact on reducing the level of dyspnea among patients in the study group.

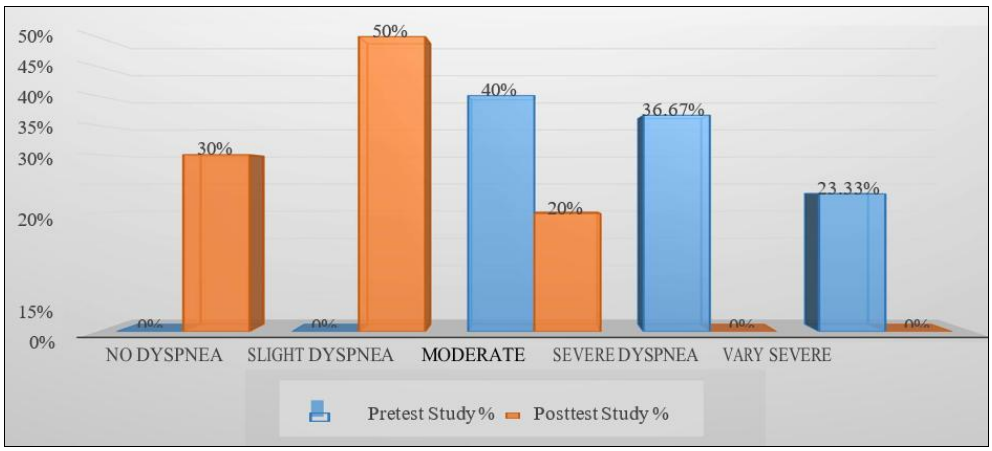

Fig 1: Study group

Compression of pre-test and post-test level on dyspnea among patient with COPD Discussion / Major Findings

Nursing intervention package (breathing exercises, positioning, education) significantly reduced dyspnea in COPD patients compared to controls.

No significant baseline group differences, supporting validity Targeted interventions can benefit patient comfort, function, and activity tolerance.

Conclusion

The structured nursing intervention package is highly effective and recommended as a routine, low-cost method to reduce dyspnea in hospitalized COPD patients. Implementing such protocols can improve patient outcomes and quality of life

Nursing Implications

Integrate systematic breathing and education interventions. in nursing care for COPD.

Train nurses in non-pharmacological techniques.

Use standardized dyspnea assessment tools for patient monitoring and care planning.

Develop hospital protocols, conduct regular workshops, and promote patient empowerment.

Limitations and Recommendations
Limited by small single-center sample.
Long-term effects, other variables (physical activity, psychosocial support) not addressed.
Recommend larger, multi-center studies, and examination of digital and remote interventions for wider applicability.

Conflict of Interest
Not available.

Financial Support
Not available.

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How to Cite This Article
Latha K, Patel S, Anand A. A study to evaluate the effectiveness of nursing intervention package on dyspnea among patients with chronic obstructive pulmonary disease admitted at NMCH, Rohtas, Bihar. International Journal of Advance Research in Medical Surgical Nursing. 2025; 7(2): 123-125.