

Efficacy of high-flow nasal cannula therapy in managing COPD patients: a systematic review

Jithin K. Sreedharan¹ 

1. Assistant Professor and Head, Department of Respiratory Therapy, University of Doha for Science and Technology, Doha, Qatar

Correspondence to: Jithin K. Sreedharan

*Assistant Professor and Head, Department of Respiratory Therapy, University of Doha for Science and Technology, Doha, Qatar.

Email: jithinksree@gmail.com

DOI: 10.24911/SJEMed.72-1740471984



Introduction:

Patients with chronic obstructive pulmonary disease (COPD) frequently require non-invasive ventilation (NIV) strategies to manage both acute exacerbations and chronic respiratory failure. The progression of COPD often leads to respiratory muscle fatigue and hypercapnia, necessitating timely intervention to prevent further clinical deterioration. NIV has become a cornerstone in the management of COPD due to its ability to reduce the need for intubation, improve gas exchange, and alleviate the work of breathing. Moreover, its use in both hospital and home settings has been associated with enhanced quality of life and reduced hospital readmissions.

Aims /Objectives:

This systematic review aims to evaluate the efficacy of high-flow nasal cannula (HFNC) therapy as a sole strategy for improving clinical outcomes in COPD patients.

Materials / Methods:

A comprehensive search of the existing literature was conducted across multiple databases, which includes PubMed, Scopus, and CINAHL, with a date restriction of 10 years (2014–2024) following the PRISMA guidelines. Randomized controlled trials and prospective cohort studies that focused on COPD patients utilizing HFNC strategies were included in the study. The primary outcomes of interest included reintubation rates, improvements in gas exchange, and overall quality of life. Secondary outcomes focused on patient comfort, hospital length of stay, and further adverse events.

Results:

After full-text screening conducted by two independent reviewers, conflicts were resolved by a third independent reviewer. A total of 23 studies met the inclusion criteria, comprising 2,345 COPD patients. The studies varied in design and sample size, but collectively provided a robust set of data on the use of HFNC in managing COPD. Key findings include: 1) HFNC was comparable to traditional NIV in reducing reintubation rates, with better patient comfort and fewer adverse events (Frat et al., 2023); 2) HFNC significantly enhanced exercise capacity and quality of life in stable hypercapnic COPD patients (Criner et al., 2021); 3) HFNC was effective in reducing hypercapnia and improving respiratory symptoms (Osadnik et al., 2017); and 4) HFNC was effective in managing severe acute exacerbations of COPD, reducing severity and hospital length of stay (Raveling et al., 2021).

Discussion:

The findings highlight the growing evidence supporting HFNC as a viable alternative to traditional NIV for managing COPD exacerbations and chronic respiratory failure, offering comparable clinical outcomes with enhanced patient comfort and tolerance. However, further research is needed to investigate the long-term benefits of HFNC and its integration with other ventilation strategies to optimize comprehensive COPD management.

Conclusion:

The evidence suggests that using HFNC is effective in managing COPD exacerbations and chronic respiratory failure. HFNC offers superior patient comfort and tolerance compared to other interfaces. Future research should explore the long-term outcomes and the potential integration of HFNC with other ventilation strategies to further optimize patient care.

Keywords:

Non-invasive ventilation, COPD, High-flow nasal cannula, Respiratory care.