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### **REVIEWER'S REPORT**

Manuscript No.: IJAR-51030

Date: 12-04-2025

Title: HIGH FLOW NASAL CANNULA THERAPY IN PAEDIATRIC INTENSIVE CARE UNIT FOR CHILDREN WITH RESPIRATORY DISTRESS WITH HYPOXIA - A RETROSPECTIVE COHORT STUDY

Recommendation:	Rating	Excel.	Good	Fair	Poor
Accept as it is <b>YES</b> Accept after minor revision Accept after major revision Do not accept ( <i>Reasons below</i> )	Originality				
	Techn. Quality				
	Clarity				
	Significance				

Reviewer's Name: Dr Aamina

Reviewer's Decision about Paper: Recommended for Publication.

**Comments** (Use additional pages, if required)

### **Reviewer's Comment / Report**

**Title Evaluation:** The title accurately reflects the primary focus of the study, which is the use of highflow nasal cannula (HFNC) therapy in children with respiratory distress and hypoxia in a pediatric intensive care unit. It clearly highlights the study's cohort design and its retrospective nature. However, the title could be more concise by removing some repetitive elements. For example, the phrase "for children with respiratory distress with hypoxia" could be simplified to "in pediatric respiratory distress with hypoxia."

**Abstract Evaluation:** The abstract provides a clear and concise summary of the study, including background, objectives, methods, results, and conclusions. The background section briefly explains HFNC and its importance, while the objectives and methodology are clearly stated. The results include relevant patient demographics and clinical details, while the conclusions succinctly outline the potential benefits of HFNC therapy in pediatric patients.

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However, the abstract could benefit from a clearer explanation of the "failure rate" and "escalation to higher O2 support" to better convey what constitutes failure and the significance of this outcome. Additionally, the mention of "no in-patient mortality" adds value but could be emphasized in the conclusions as a key positive finding of the study.

**Introduction Evaluation:** The introduction provides adequate background on acute respiratory distress in pediatric patients and the associated risks of invasive mechanical ventilation. The explanation of HFNC as a non-invasive alternative is clearly stated. It successfully contextualizes the study by referencing the challenges of invasive mechanical ventilation and the potential benefits of HFNC therapy.

A more thorough review of the existing literature could strengthen this section by comparing HFNC with other non-invasive therapies. While the introduction briefly mentions HFNC's effectiveness, more details on its mechanism of action and prior research outcomes would offer a more comprehensive context for the study.

**Methods Evaluation:** The study design is clearly stated as a retrospective cohort study conducted at a pediatric intensive care unit. The inclusion criteria (children aged 1 month to 18 years with acute respiratory distress and hypoxia on HFNC therapy) are well-defined. The methods outline the variables considered (demographics, clinical course, vital parameters, etc.), and the process for data collection is described with sufficient detail.

However, the study would benefit from additional information on how the HFNC therapy was standardized across patients, as the study does not specify whether HFNC settings (e.g., flow rates, FiO2) varied according to specific clinical conditions. Also, while the study evaluates patient outcomes, it does not provide detailed definitions or measures of "failure" in HFNC therapy. Clarification of what constitutes failure (e.g., escalation to invasive ventilation) would improve transparency.

**Results Evaluation:** The results section clearly presents key findings, including patient demographics, common indications for HFNC, and the failure rate. It is noted that 57 patients were downgraded to lower oxygen support (LFNC), and 8 patients were escalated to higher oxygen support, with a failure rate of 10.6%. The average duration of HFNC therapy is also provided (2-4 days), along with information on the discharge status (no inpatient mortality).

This section is well-organized, but additional statistical analysis (e.g., p-values, confidence intervals) would strengthen the findings and provide a clearer sense of the significance of the results. For example, was the failure rate statistically significant, and how did it vary by age, underlying conditions, or specific indications for HFNC therapy? Including such details would enhance the validity of the study's conclusions.

**Conclusions Evaluation:** The conclusions are aligned with the study's objectives and key findings. HFNC therapy is recommended as a first-line treatment for acute respiratory distress with hypoxia in

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children, and it is highlighted as an effective non-invasive option for reducing the need for intubation and minimizing the risk of ventilator-associated pneumonia (VAP).

While these conclusions are valid, they would be even stronger with a more detailed discussion of the clinical implications. For instance, how can these findings inform clinical guidelines or change practice in pediatric intensive care units? Moreover, the study could expand on potential areas for further research, such as examining long-term outcomes for children treated with HFNC or exploring factors influencing its success rate across different subgroups.

**Clarity of Writing:** The writing is generally clear, and the study's objectives and results are easy to follow. However, there are occasional minor grammatical errors and awkward sentence structures that could be improved for readability. For example, "this can lead washout of the upper airways" would be clearer if rephrased as "this can lead to washout of the upper airways." Proofreading for language and clarity would enhance the readability of the paper.

**Statistical and Analytical Considerations:** While the study provides descriptive data and discusses the failure rate, it would benefit from more comprehensive statistical analysis. For instance, including multivariable regression models or exploring risk factors associated with HFNC failure would strengthen the study's findings and provide a more robust understanding of the factors influencing HFNC efficacy. Additionally, clearer explanations of the statistical tests used would improve the transparency of the analysis.

**Ethical Considerations:** The study briefly mentions the patient demographic details and the cohort design but does not mention ethical approval or patient consent. For a retrospective study, this information should be explicitly stated to ensure that the study adheres to ethical guidelines. It would also be important to mention how patient data confidentiality was maintained.

**Overall Impression:** This study provides valuable insights into the use of HFNC therapy in pediatric patients with acute respiratory distress and hypoxia. The research is well-organized and relevant, offering important information on the efficacy and failure rates of HFNC in this patient population. While the study design and results are clearly presented, the paper would benefit from more detailed statistical analysis, clearer definitions of failure, and a deeper discussion of the clinical implications. Additionally, minor improvements in writing and figure clarity would enhance the overall quality of the paper.