

Letter to the Editor

Insights About the Human-Centered Design Analysis as a Tool to Improving Patients' Tolerance with Non-Invasive Ventilation

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Abbreviations: noninvasive ventilation, NIV

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Dear Editor:

We have read the article, [Exploring the Patient Experience with Noninvasive Ventilation: A Human-Centered Design Analysis to Inform Planning for Better Tolerance](#), with great interest, which allows us to analyze the perspective of the patient and the psychological impact associated with initiation, maintenance, and methodology of treatment with non-invasive ventilation (NIV).¹ We want to congratulate the authors for this original study. However, in order to extend the results obtained and identify new strategies

to improve tolerance with NIV, we consider some issues that need more clarification.

First, in this study, patients were interviewed using a guide based on the human-centered design motivational approach. However, it is not clarified whether there were any aspects that could affect the patient's neuropsychological state prior to entering the study; particularly, it is not specified if the patients had a previous history of evaluation from psychology-psychiatric conditions or if they were using anxiolytic or antidepressant drugs before entering the hospital and undergoing NIV.

Concerning the study's methodology, it is also unclear if the semi-structured interview technique used has been previously validated or tested by an expert panel. Also, authors say that "the steps of the patients' experience are captured in a stepwise narrative creating a journey map"¹ but it is not clear if interviewers used any type of interventions for those patients who did not show adherence to this protocol, thus, affecting the description of the overall experience and data collection. Another methodological problem is the analysis of patients' emotions and their codification as negative, neutral, or positive; in this regard it would be important to know if the authors used any grading scheme to encode emotions that would give objectivity and reproducibility to the data analysis.

Other important aspects to consider are the application methods and monitoring protocols for NIV.

Firstly, the authors identify the discomfort with the mask as one of the main themes which influenced tolerance to NIV. However, physicians are often aware that interface intolerance is one of the main factors in NIV failure and they often apply several strategies to increase patients' comfort and adherence.² This study did not analyze whether this problem was stable during treatment and the observation period or if strategies had been implemented to solve it. Secondly, it must be considered that the level of acceptance of NIV also depends on the ventilation mode used and the patient-ventilator synchrony.³ In this study, the ventilation modality and its changes during the treatment are not specified and patients may have attributed to the mask the discomfort related to inadequate adaptation and breathing synchronization with a ventilator. In addition, since it becomes often necessary to use analgo-sedative drugs to keep the patient in a comfortable condition while receiving NIV,⁴ it would be helpful to know if patients received pharmacological support during ventilation. Lastly, the setting of the application of NIV is not reported and this aspect is important because the hospital environment influences the patient's psychological state and perception of

treatment.⁵

The authors also discuss how patients felt threatened by fear of intubation. We feel this is very difficult to address as patients often present during an exacerbation and are high risk for invasive ventilation support. Therefore, this condition requires teaching clinicians to stress the importance of NIV to patients as a means of preventing progression to intubation. Similarly, it was not reported if this perception, reported by patients, was mostly in those who did fail at using NIV or if they were non-responsive and awoke wearing the mask. This is important as these conditions could have increased the feelings of fear.

In conclusion, we think that future studies are important to know if this optimization protocol based in NIV-patient experience is a useful rational approach to improve NIV tolerance.

Declaration of Interest

The authors have no conflicts of interest to report.

References

1. McCormick JL, Clark TA, Shea CM, et al. Exploring the patient experience with noninvasive ventilation: a human-centered design analysis to inform planning for better tolerance. *Chronic Obstr Pulm Dis*. 2022;9(1):80-94. doi: <https://doi.org/10.15326/jcopdf.2021.0274>
2. Carron M, Freo U, BaHammam AS, et al. Complications of non-invasive ventilation techniques: a comprehensive qualitative review of randomized trials. *Br J Anaesth*. 2013;110(6):896-914. doi: <https://doi.org/10.1093/bja/act070>
3. Di Marco F, Centanni S, Bellone A, et al. Optimization of ventilator setting by flow and pressure waveforms analysis during noninvasive ventilation for acute exacerbations of COPD: a multicentric randomized controlled trial. *Crit Care*. 2011;15(6):R283. doi: <https://doi.org/10.1186/cc10567>
4. Ozyilmaz E, Ugurlu AO, Nava S. Timing of noninvasive ventilation failure: causes, risk factors, and potential remedies. *BMC Pulm Med*. 2014;14:19. doi: <https://doi.org/10.1186/1471-2466-14-19>
5. Devlin JW, Skrobik Y, Gélinas C, et al. Executive summary: clinical practice guidelines for the prevention and management of pain, agitation/sedation, delirium, immobility, and sleep disruption in adult patients in the ICU. *Crit Care Med*. 2018;46(9):1532-1548. doi: <https://doi.org/10.1097/ccm.0000000000003259>