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The use of non-invasive mechanical ventilation in patients with COVID-19: an integrative review

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Introduction: COVID-19 has affected thousands of people and was declared a pandemic by the World Health Organization in March 2020. One of the most affected organs is the lung, and the inflammatory process caused by the SARS-CoV-2 virus can impair gas exchange, resulting in acute hypoxemic respiratory failure and, in some cases, Acute Respiratory Distress Syndrome (ARDS).^(1,2) Non-invasive mechanical ventilation (NIV) has assisted in the treatment of some patients with the SARS-CoV-2 virus.⁽³⁾ This therapy provides positive pressure ventilation and helps normalize lung volumes, improve respiratory muscle function and lung mechanics, as well as attenuate hypoxemia.

Objective: To analyze the effectiveness of non-invasive mechanical ventilation in hypoxemic patients affected by COVID-19 in the existing literature.

Methods: Integrative review study through article searches in the databases SciELO, PubMed, Embase, and Bireme in June and July 2021. A total of 224 articles

were pre-selected based on title and abstract. Among these, 40 were selected for subsequent full-text reading (Figure 1).

Results: Thirteen articles met the inclusion criteria. Of these, 12 mention the success rate of NIV therapy, which ranges from 24.3% to 72.1%. The lowest success rate was reported in Italy during the initial period of the pandemic, at a time of limited understanding of the disease, high demand, and scarce resources. Eight studies (66.6%) reported a NIV success rate greater than or equal to 50%. A limitation observed in the vast majority of the studies is the retrospective observational design. Furthermore, only 3 articles presented a multicenter dimension with distinct populations. Given the variety of techniques, interfaces, and parameters used, success or failure rates may differ in other contexts, experiences, or populations. Heterogeneity was found in the therapeutic management among institutions and a lack of beds or resources. Selected cohorts of patients, usually more severe cases, may have contributed to some degree of bias in outcome associations, as well as the absence of control groups, which prevents a reliable comparison of NIV effectiveness with other ventilatory modalities.

Conclusion: The use of NIV as an initial strategy in COVID-19 patients requiring ventilatory support is associated with symptom improvement and survival in a similar proportion of patients. Therapeutic efficacy was observed in approximately half of the cases, which did not progress to invasive ventilation or death. However, bedside monitoring is essential to identify patients at high risk of failure and determine the need for invasive support at the appropriate time. Further randomized clinical trials are needed to determine the most appropriate use of NIV in this patient context.

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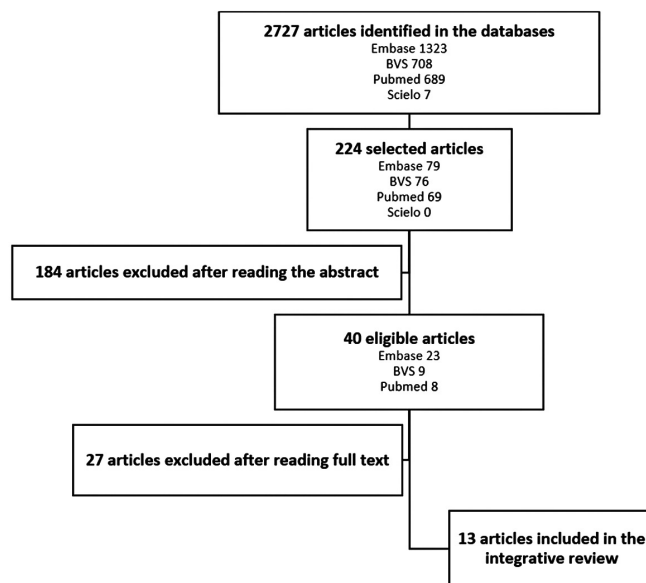


Figure 1. Flowchart of study selection in databases