

Quality of Life In Post ICU COVID Patients: A Literature Review

Ahmad Akmaluddin¹, Bambang Pujo Semedi^{2*}, Andriati³, Isnin Anang²

¹ Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia

² Department of Anesthesiology and Reanimation, Faculty of Medicine/Dr. Soetomo General Academic Hospital, Universitas Airlangga Surabaya, Indonesia

³ Department of Physical Medicine and Rehabilitation/Dr. Soetomo General Academic Hospital, Universitas Airlangga Surabaya, Indonesia

⁴ Departement of Pulmonolgy and Respiratory/Dr. Soetomo General Academic Hospital, Universitas Airlangga Surabaya, Indonesia.

*Corresponding Author

Abstract

Patients who have survived the COVID-19 outbreak around the world still exhibit signs of the sickness while having negative clinical tests. According to the National Institute of Excellence's recommendations, The term "post COVID-19," also referred to as "long COVID-19," describes signs and symptoms that first arose during or following a sickness that is compatible with COVID-19 and that persist for longer than four weeks without being adequately explained by another diagnosis.. This literature study aims to identify the signs and symptoms that happen after covid recovery as well as its effects on quality of life.

Keywords: Post – Covid 19; ICU Patients ; Quality of Life

1. Introduction

The severe acute respiratory syndrome coronavirus 2 strain, a novel coronavirus that causes the 2019 coronavirus disease (COVID-19) (SARS-CoV-2). Every nation has been affected by the global pandemic, which started in Wuhan, China, in December 2019 [1]. Early pandemic figures show that one in five infected people are hospitalized, and one in ten of these people may require intensive treatment the majority of whom have acute respiratory distress syndrome (ARDS) and need respiratory ventilation. [2]. The post-intensive care syndrome, which affects up to 80% of patients who survive acute respiratory failure after receiving mechanical ventilation in the ICU, is characterized by the development of new or deteriorating physical, cognitive, and/or mental health impairments that last after hospital discharge [3]. The danger of physical impairments increases when severe respiratory failure brought on by COVID-19 necessitates long periods of artificial ventilation, profound sedation, neuromuscular blockade, and the ensuing immobility. Long-term endotracheal tube intubation may also result in laryngeal injury, difficulty swallowing, and functional voice difficulty, all of which may go unrecognized without thorough screening and assessment. [4].

Naturally, the physical and psychological effects of COVID-19 have drawn a lot of professional and academic attention. Three to eight months after their first diagnosis, survivors of COVID-19 demonstrated rapid and long-term effects, according to research based on cohort and case-control studies. For instance, a previous studies collected from numerous countries revealed permanent harm to multiple organ systems [5]. The most frequently reported symptoms in patients with various disease severity levels included dyspnea, muscle weakness, exhaustion, and sleep problems. After three to six months, 51%-62% of COVID-19 survivors saw a decrease in health-related quality of life (HRQoL) [6]. Studies on the COVID 19 patients' quality of life (QOL) after discharge or recovery have exploded in this environment. Therefore, gathering global data on the COVID 19 patients' QOL after discharge or recuperation is important and timely. This literature review was done to combine the scientific data on QOL and the factors that affect it among adult COVID 19 survivors at various time points in light of its significance.

2. ICU Treatment and Ventilation in ICU Covid - 19 Patients

As mentioned above, severe Covid – 19 may result in patients being critically ill and requiring treatment in the ICU. The factors influencing morbidity and mortality in hospitalized COVID-19 patients were examined in several studies. Old age, the prevalence of comorbidities such hypertension, Diabetes Mellitus (DM), morbid obesity, chronic lung illness, coronary artery disease, chronic renal disease, and cancers were all associated with a bad prognosis [7]. A life-threatening form of respiratory failure known as acute respiratory distress syndrome (ARDS) is frequently experienced by COVID-19 patients which may corroborate the need of ICU admission. According to overall distribution made from data spanning research findings that have COVID-19 data available, 33% of hospitalized patients experience ARDS. ARDS is present in roughly 3/4 (or 75%) of COVID-19 patients admitted to the ICU [8]. The majority of patients who are admitted to the ICU will eventually require invasive mechanical ventilation and ventilator support [9].

2.1. ICU Treatment

The majority of COVID - 19 patients present with minor illnesses and recover from the infection, however life-threatening illnesses can also develop and necessitate admission in the intensive care unit (ICU). Acute Respiratory Distress Syndrome (ARDS), sepsis, multi-system organ failure, hyper-inflammation, neurological and other extra-pulmonary symptoms, and thromboembolic illness are the characteristics of severe COVID-19 [10]. As mentioned before, Several studies looked at the variables affecting morbidity and mortality in hospitalized COVID-19 patients. A poor prognosis was linked to advanced age, the prevalence of comorbid conditions [7]. Other parameters such as laboratory results such as lymphocytopenia, as well as higher levels of inflammatory biomarkers like interleukin-6, lactate dehydrogenase, and C-reactive protein, among others were reportedly linked to a poor outcome [11]

2.2 ARDS (Acute Respiratory Distress Syndrome)

Acute respiratory distress syndrome (ARDS)-qualifying hypoxemic respiratory failure may result with COVID-19. Both direct viral impacts and chemicals produced from host cells cause ARDS. The immune system's activated cells release a number of substances, including eosinophil major basic proteins and cationic proteins, neutrophil myeloperoxidases and other proteinases, and excessive amounts of proinflammatory

cytokines, such as IL-6 and TNF-, which can cause extensive tissue damage, ARDS aggravation, and mortality. In contrast to patients with traditional ARDS, patients with COVID-19 ARDS may have normal or even high lung compliance. According to its specificity, the severity of COVID-19 ARDS is now classified into three stages: mild, mild-moderate, and moderate-severe. As a result, COVID-19 ARDS patients require mechanical breathing for longer than patients with other forms of ARDS [12].

2.3 Mechanical Ventilation

According to the majority of research from North America, 10–20% (depending on age) of hospitalized patients require some type of mechanical ventilatory assistance because they have acute hypoxemic respiratory failure, either in the ward or the ICU [13]. Invasive mechanical ventilation was found to last an average of 8.4 (95% confidence interval [CI] 1.6-13.7) days in patients with coronavirus disease (COVID-19) admitted to the intensive care unit (ICU); however, the use is prolonged in some individuals. The chance of developing ventilator-induced pulmonary strain injuries with the length of time a patient is on respiratory support, and lung damage increases with time. [14].

3. Post Covid Effects on Quality of Life

According to early reports, COVID - 19 infection may still cause symptoms like tiredness, shortness of breath, angina, cognitive problems, arthralgia, and a decline in health - related quality of life (HRQoL). These sequelae may be caused by cellular damage, an active innate immune response that produces inflammatory cytokines, and a pro-coagulant state brought on by covid infection [5].

Normal definitions of HRQoL include multiple dimensions. The best way to evaluate it is by the patients themselves using patient-reported outcome measures because it is subjective (PROMs). Measurements of the patient's physical, psychological, and social functioning are frequently included in questionnaires designed to assess HRQoL, in addition to questions about disease symptoms and therapy [17]. According to CDC HRQoL assessment, policy creation, and assurance are the three main facets of public health that are supported by surveillance. Regarding an evaluation, HRQoL surveillance is utilized to find unmet community health needs, including population trends, inequities, and health factors [18]. In the pandemic determining how COVID 19 will affect those affected is crucial and timely so that healthcare professionals and governmental organizations can better prepare to support them. One's health and wellbeing can be measured and evaluated using QOL, which is a popular indicator. There are at least 150 distinct QOL evaluation tools available. Of these, SF-36, SF-12, EQ-5D-5L, and EQ-5D-3L are the most often employed in various contexts around the globe. [19]

ICU patients in the United Kingdom reported experiencing new problems regarding to health - related quality of life (HRQoL) such as issues in mobility, self - care and usual activities. Worsening breathlessness and fatigue not experienced before covid infection was also reported to be common among the patients. It is found that those who require ICU admission and respiratory support, have premorbid lung conditions, are older, have higher BMIs, and are more likely to have breathlessness after discharge [15]. Another study in Spain also supported this finding which stated that compared to their pre-COVID-19 condition, a high percentage of patients reported reduced quality of life, decreased functional status, and persisting symptoms 6 months after needing ICU admission and a lower quality of life were linked to advanced age, male sex, the necessity for mechanical breathing during ICU stays, the length of those stays, and the duration of that ventilation. The patients were tested with the EuroQol five-domain, three - level questionnaire (EQ-5D-3L). It is divided into two parts: the descriptive system, and the visual analog scale. Mobility, self-care, usual

activities, pain/discomfort, and anxiety/depression are the five areas that the descriptive system evaluates. There are three possible response options for each domain: no problems, moderate problems, or serious problems. Majority of the patients reported moderate to severe problems regarding decreasing mobility, pain, and anxiety [16].

4. Conclusion

It can be concluded from the publications that ICU patients commonly experienced symptoms of post – covid especially those who experienced lung conditions and requiring respiratory support. Quality of life dimension such as mobility, usual activities, and anxiety are found to be commonly affected .

References

1. Rai DK, Sharma P, Kumar R. Post covid 19 pulmonary fibrosis. Is it real threat? Indian J Tuberc. 2021 Jul;68(3):330-333. doi: 10.1016/j.ijtb.2020.11.003. Epub 2020 Nov 10. PMID: 34099197; PMCID: PMC7654356.
2. CDC COVID-19 Response Team. Severe outcomes among patients with coronavirus disease 2019 (COVID-19) — United States, February 12–March 16, 2020. MMWR Morb. Mortal. Wkly Rep. 69, 343–346 (2020). Deep-Burn Project: Annual Report for 2009, Idaho National Laboratory, Sept. 2009.
3. Needham, D. M. et al. Improving long- term outcomes after discharge from intensive care unit: report from a stakeholders' conference. Crit. Care Med. 40, 502–509 (2012).
4. Brodsky, M. B. et al. Laryngeal injury and upper airway symptoms after oral endotracheal intubation with mechanical ventilation during critical care: a systematic review. Crit. Care Med. 46, 2010–2017 (2018).
5. Nalbandian A, Sehgal K, Gupta A, Madhavan MV, McGroder C, Stevens JS, et al. Post-acute COVID-19 syndrome. Nat Med. 2021 Apr;27(4):601–15. <http://dx.doi.org/10.1038/s41591-021-01283-z>. PubMed. 1546-170X
6. Morin L, Savale L, Pham T, Colle R, Figueiredo S, Harrois A, et al.; Writing Committee for the COMEBAC Study Group. Four-Month Clinical Status of a Cohort of Patients After Hospitalization for COVID-19. JAMA. 2021 Apr;325(15):1525–34. <http://dx.doi.org/10.1001/jama.2021.3331>. PubMed. 1538-3598
7. Li X, Xu S, Yu M, Wang K, Tao Y, Zhou Y, et al. Risk factors for severity and mortality in adult COVID-19 inpatients in Wuhan. J Allergy Clin Immunol 2020;146:110–8.
8. Tzotzos SJ, Fischer B, Fischer H, Zeitlinger M. Incidence of ARDS and outcomes in hospitalized patients with COVID-19: a global literature survey. Crit Care. 2020;24(1):1–4.
9. Ferrando C., Suarez-Sipmann F., Mellado-Artigas R., Hernandez M., Gea A., Arruti E., Aldecoa C., Martinez-Palli G., Martinez-Gonzalez M.A., Slutsky A.S., et al. Clinical features, ventilatory management, and outcome of ards caused by covid-19 are similar to other causes of ards. *Intensive Care Med.* 2020;46:2200–2211. doi: 10.1007/s00134-020-06192-2.
10. Cui S, Chen S, Li X, Liu S, Wang F. Prevalence of venous thromboembolism in patients with severe novel coronavirus pneumonia. *J Thromb Haemost* 2020;18:1421–4.
11. Du RH, Liang LR, Yang CQ, Wang W, Cao TZ, Li M, et al. Predictors of mortality for patients with COVID-19 pneumonia caused by SARS-CoV-2: a prospective cohort study. *Eur Respir J* 2020;55:2000524.
12. Aslan, A., Aslan, C., Zolbanin, N.M. et al. Acute respiratory distress syndrome in COVID-19: possible mechanisms and therapeutic management. *Pneumonia* 13, 14 (2021). <https://doi.org/10.1186/s41479-021-00092-9>
13. CDC Cases, Data, and Surveillance. Available at <https://protect-public.hhs.gov/pages/hospital-capacity>. Accessed 27 November 2022
14. Taniguchi H, Ohya A, Yamagata H, Iwashita M, Abe T, Takeuchi I (2022) Prolonged mechanical ventilation in patients with severe COVID-19 is associated with serial modified-lung ultrasound scores: A single-centre cohort study. *PLoS ONE* 17(7): e0271391. <https://doi.org/10.1371/journal.pone.0271391>
15. Halpin SJ, McIvor C, Whyatt G, et al. Postdischarge symptoms and rehabilitation needs in survivors of COVID-19 infection: A cross-sectional evaluation. *J Med Virol.* 2020;1–10. <https://doi.org/10.1002/jmv.26368>
16. Taboada, M. et al. (2021) “Quality of life, functional status, and persistent symptoms after intensive care of COVID-19 patients,” *British Journal of Anaesthesia*, 126(3). Available at: <https://doi.org/10.1016/j.bja.2020.12.007>.
17. Amdal CD, Pe M, Falk RS, Piccinin C, Bottomley A, Arraras JI, Darlington AS, Hofso K, Holzner B, Jørgensen NMH, Kulis D, Rimehaug SA, Singer S, Taylor K, Wheelwright S, Bjordal K. Health-related quality of life issues, including symptoms, in patients with active COVID-19 or post COVID-19; a systematic literature review. *Qual Life Res.* 2021 Dec;30(12):3367–3381. doi: 10.1007/s11136-021-02908-z. Epub 2021 Jun 19. PMID: 34146226; PMCID: PMC8214069.
18. *HRQOL surveillance* (2021) *Centers for Disease Control and Prevention*. Centers for Disease Control and Prevention. Available at: <https://www.cdc.gov/hrqol/surveillance.htm> (Accessed: December 5, 2022).
19. Burckhardt CS, Anderson KLJH, outcomes qol. The Quality of Life Scale (QOLS): reliability, validity, and utilization. 2003; 1(1):1–7.

