

Research Article

Post COVID Syndrome: The spectrum of symptoms challenging patient healthcare and Quality of life using EQ-5D-5L post discharge

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ABSTRACT

Introduction: COVID-19 has been linked to the development of post-COVID syndrome, which typically presents with symptoms. There is limited evidence of post-COVID syndrome, particularly in individuals with asymptomatic or moderate infections from India.

Material & Method: This single-centre retrospective cohort study was conducted on COVID-19-recovered patients at MNR Medical College & Hospital, Sangareddy. All the patient's records, admitted due to COVID-19 infection from April to July 2021 were collected. Patients diagnosed by RTPCR, treated for COVID-19, and recovered to discharge were included in the study after obtaining the informed consent. A predesigned questionnaire capturing the data related to the post-COVID symptoms and responses from all the patients was collected through telecommunication and Google forms through email. The impact of each domain is measured on a Likert scale with 1 as the minimum and 10 as the maximum score—the EQ-5D-5L to assess the various domains among the patients.

Result: A total of 400 patients were recruited for the study. The post covid symptoms are seen in almost all cases. Most common long-term COVID symptoms include post-viral fatigue (56.5%), post-exertional dyspnoea (39.1%), anosmia (34.8%), myalgia (34.8%), insomnia (32.6%), arthralgia (32.6%), persistent cough (30.4%), headache (30.4%), palpitations (17.4%). On EQ-5D-5L there was a significant difference in the anxiety and depression domain among the patients.

Conclusion: Understanding the long-term effects of COVID-19 is as it is a multisystemic disease impacting health and well-being, helping healthcare workers to focus on the health and recovery of the patient post-discharge from the hospital.

Keywords: Covid-19, Post covid syndrome, Fatigue, Insomnia, Rehabilitation.

1. INTRODUCTION

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), the virus responsible for the global COVID-19 pandemic, has led to extraordinary rates of illness and death across the world. With an increasing number of individuals recovering from the acute infection, it has become critically important to understand the post-COVID complications that may affect these patients.[1-3]. Post-COVID syndrome, commonly known as long COVID, was initially recognized as a separate clinical entity in early 2020. It became apparent when individuals

reported persistent symptoms lasting weeks beyond their recovery from the acute stage of COVID-19. This recognition was largely based on findings from the first in-depth patient surveys, which offered valuable insights into the nature of the condition [4, 5].

At that point, the medium- and long-term complications experienced by COVID-19 survivors after hospital discharge remained largely uncertain. However, emerging research was starting to provide clarity. One follow-up study from Italy, conducted over a 7-week period, found that among 143 participants, 53%

reported fatigue, 43% experienced shortness of breath, and 27% suffered from joint pain [6]. Several studies suggest that the incidence of post-COVID syndrome among hospitalized patients can be as high as 85%. Fatigue is the most frequently reported symptom, affecting between 17.5% and 72% of individuals, followed by persistent shortness of breath in 10% to 40% of cases. Other commonly observed symptoms include mental health disturbances (26%), chest pain (22%), and altered sense of smell or taste (11%). Notably, over one-third of those affected by post-COVID syndrome have pre-existing comorbidities, with hypertension and diabetes mellitus being the most prevalent [4].

The EQ-5D-5L, introduced by the EuroQol Group in 2009, was developed to enhance sensitivity and reduce the ceiling effect observed in the earlier EQ-5D-3L version. It includes two main components: a descriptive system and the EQ Visual Analogue Scale (EQ VAS), both of which assess various aspects of an individual's health status. This study aimed to explore the persistent symptoms and complications in individuals who had recovered from COVID-19. Chronic COVID-19 has been associated with a broad range of long-term symptoms and health conditions, which may arise due to ongoing inflammation, residual organ damage during the recovery phase, or non-specific effects of extended respiratory support [7, 8]. Therefore, a systematic study of post-COVID sequelae is essential to develop an evidence-based, multidisciplinary approach for managing these patients. There is a notable gap in the literature, particularly concerning large-population countries like India. The significance of this study lies in identifying post-COVID symptoms and potential complications. It aims to highlight the health status and recovery of patients following hospital discharge and assist in recognizing those who may benefit from rehabilitation services. Hence present study aimed to describe the incidence and clinical symptom pattern among post covid patients who recovered from disease.

2. MATERIAL AND METHODS

This single-centre retrospective cohort study was

conducted at MNR Medical College & Hospital, Sangareddy, to determine post-COVID symptoms and any associated complications in patients who had recovered from COVID-19. Medical records of patients admitted for COVID-19 infection between April and July 2021 were reviewed. The study included patients who were diagnosed with COVID-19 via RT-PCR, treated, and subsequently discharged after recovery, following informed consent. Patients who were critically ill, pregnant women, and children were excluded from the study.

The demographic and clinical data were collected from the medical records and the telephone or mobile number were procured from the records after obtaining the informed consent. A predesigned questionnaire capturing the data related to the post COVID symptoms and response from all the patients were collected through telecommunication and Google forms through email. The impact of each some domain is measured on Likert scale with 1 as minimum and 10 as maximum score. The **EQ-5D-5L** to assess the various domain among the patients. The descriptive system comprises five dimensions: mobility, self-care, usual activities, anxiety/depression and pain/discomfort. Each dimension has 5 levels: extreme problems, severe problems moderate problems, slight problems, and no problems (going from score 1 as no problem to 5 as extreme problems). Patients are asked to indicate their health status by checking the box next to the health status or verbally mentioning the most appropriate statement in each of the five dimensions.(9) This determination yields a single-digit number representing the level selected for that dimension. The EQ VAS recorded the patient's self-rated health status on a vertical visual analogue scale, using endpoints labelled 'worst imaginable health' and 'best imaginable health'. VAS is a quantitative measure of health result that represents the patient's personal evaluation [9].

Statistical analysis

The participant's data were collected in proforma and the collected data were represented in tables, and figures as frequency, percentage, mean and standard deviation. All the statistical analysis

was carried using SPSS V26.0 operating on windows 10, and $p < 0.05$ was considered statistical significance level for all analytical purpose.

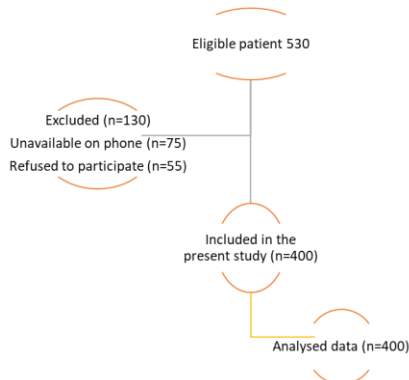


Figure 1: STROBE flow diagram of Participants

3. RESULTS

A total of 400 patients were recruited for study with mean age of the patients 47.23 ± 17.78 yrs, male predominance with 74% males and 26% female participants.

Table 1. Showing the post covid symptoms among patients

	Frequency	Percent
Discharge	336	84
Death	60	15
Post viral fatigue	228	57
Persistent cough	120	30
Insomnia	128	32
Sleep disorder	112	28
Headache	120	30
Vertigo	104	26
Post exertional dyspnea	160	40
Rashes	92	23
Restless leg syndrome	52	13
Anosmia	136	34
Tinnitus	40	10
Nasal blockade	68	17
Arthralgia	128	32
New onset diabetes	52	13
Myalgia	136	34

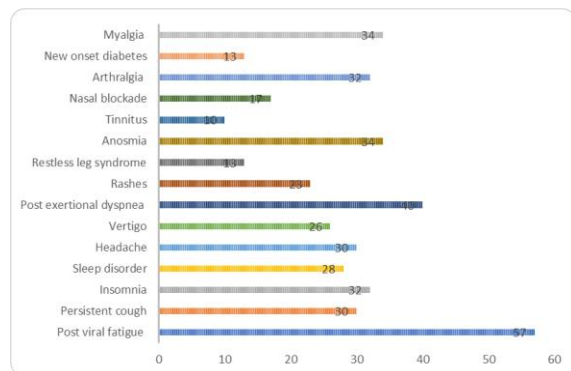


Figure 2: Showing the post covid symptoms among patients

4. DISCUSSION

For years, patient-reported outcome measures have been utilized to assess the quality of life in recovering patients within both clinical and research settings. Numerous studies have effectively demonstrated their significance. Recent research underscores the importance of global rehabilitation protocols in evaluating the quality of life in COVID-19 patients and guiding clinicians to prioritize the patient's overall recovery [10-15].

Table 2: Comparison of EQ-5D-5L Dimension scores at discharge

EQ-5D-5L Dimension	At discharge (Mean \pm SD)	At 8 weeks (Mean \pm SD)	p-value
Mobility	1.19 \pm 0.62	1.11 \pm 0.51	0.28
Self-care	1.11 \pm 0.52	1.05 \pm 0.38	0.34
Usual activity	1.16 \pm 0.56	1.07 \pm 0.4	0.153
Pain or discomfort	1.21 \pm 0.63	1.10 \pm 0.52	0.17
Anxiety or depression	1.44 \pm 0.66	1.02 \pm 0.19	0.01*

In present study most common long covid symptoms include post viral fatigue, post exertional dyspnoea, anosmia, myalgia, insomnia, arthralgia, persistent cough, headache, circadian rhythm sleep disorders. other symptoms include vertigo, rash, palpitations, nasal blockade, tachycardia, non-ulcer dyspepsia, chest pain, new onset diabetes mellitus (13%) burning feet, tinnitus, disturbance in memory. Similar to present study, Naik *et al.*, (2021) documented the Most common symptoms included 10.9percent with myalgia, 6.1percent with shortness of breath, 5.5percent with fatigue, cough in 2.1percent, insomnia in 1.4percent, mood disturbances in 0.48percent and anxiety among 0.6percent patients [16].

In concordance, Anjana *et al.*, in Kerala documented the 5.8percent headache, Fatigue, 3.2percent with myalgia, 2.5percent exertional dyspnea and joint pain as main symptoms [17]. Similarly, Uniyal *et al.*, (in Northern India documented that disease severity had a significant impact on post-COVID symptom persistence for up to 12 weeks, with fatigue and sleep disturbance being the most common complaints [18].

The study documented a significant difference in the anxiety and depression domain according to the EQ-5D-5L questionnaire. Similar to present study, among all the domains anxiety and

depression domain showed a significant difference [15]. The number of individuals experiencing anxiety and depression showed a significant decline. Moreover, a statistically significant difference was observed between the patient's score at the time of discharge and at week 8. These findings, aligning with previous research, highlight a clear association between psychological stress and pandemic-related experiences [19-22]. Anxiety/depression gradually diminishes over time as the immediate fear of mortality and morbidity recedes and the psychopathological impact of inflammatory mediators recedes [23]. Additionally, the physical absence of loved ones during hospitalization and recovery leads to feelings of isolation.

Further research is needed to determine the need for rehabilitation of patients with post-COVID 19 symptoms in order to accelerate function recovery and improve quality of life.

5. CONCLUSION

In COVID-19 patients with minimal symptoms, the presence of post-COVID syndrome is not uncommon. Understanding the long-term effects of COVID-19 is just as important as treating the acute phase of the illness, as it affects multiple systems and significantly impacts overall health and well-being. The most common symptoms include post-viral fatigue, post-exertional dyspnea, and anosmia. Among the patients in this study, 84.8% were discharged, while 15.2% were recorded as deaths after discharge. This study assists healthcare workers in focusing on the health and recovery of patients after discharge from the hospital and helps identify those who may require rehabilitation.

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Conflict of interest

Authors declare no conflict of interest in publishing the work.

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Ethical information The study was approved by the Institutional ethics committee of MNR Medical College & Hospital, Sangareddy, Telangana, India.

REFERENCES:

1. Sharma A, Tiwari S, Deb MK, Marty JL. Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2): a global pandemic and treatment strategies. *Int J Antimicrob Agents*. 2020;56(2):1-10.
2. Lai C-C, Shih T-P, Ko W-C, Tang H-J, Hsueh P-R. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and coronavirus disease-2019 (COVID-19): The epidemic and the challenges. *Int J Antimicrob Agents*. 2020;55(3):105924.
3. Nalbandian A, Sehgal K, Gupta A, Madhavan M V, McGroder C, Stevens JS, et al., Post-acute COVID-19 syndrome. *Nat Med*. 2021;27(4):601-15.
4. Pavli A, Theodoridou M, Maltezos HC. Post-COVID Syndrome: Incidence, Clinical Spectrum, and Challenges for Primary Healthcare Professionals. *Arch Med Res*. 2021;52(6):575-81.
5. Halpin SJ, McIvor C, Whyatt G, Adams A, Harvey O, McLean L, et al. Postdischarge symptoms and rehabilitation needs in survivors of COVID-19 infection: A cross-sectional evaluation. *J Med Virol*. 2021;93(2):1013-22.
6. Carfi A, Bernabei R, Landi F. Persistent Symptoms in Patients After Acute COVID-19. *JAMA*. 2020;324(6):603-5.
7. Liang L, Yang B, Jiang N, Fu W, He X, Zhou Y, et al. Three-month Follow-up Study of Survivors of Coronavirus Disease 2019 after Discharge. *J Korean Med Sci*. 2020;35(47):e418.

8. Garg P, Arora U, Kumar A, Wig N. The “post-COVID” syndrome: How deep is the damage? *J Med Virol.* 2021;93(2):673-4.
9. EQ-5D-5L [Internet]. Available from: <https://euroqol.org/eq-5d-instruments/eq-5d-5l-about/>
10. Anurag Y, Mala RD, Yadav BSH, Padmasree D, Anmol MG, Nanda KLG. ABO blood group relationship with COVID-19 occurrence and severity. *Indian J Clin Anat Physiol.* 2022;9(3):192-6.
11. Yuan Y, Liu Z-H, Zhao Y-J, Zhang Q, Zhang L, Cheung T, et al. Prevalence of post-traumatic stress symptoms and its associations with quality of life, demographic and clinical characteristics in COVID-19 survivors during the post-COVID-19 era. *Front Psychiatry.* 2021;12:665507.
12. Garrigues E, Janvier P, Kherabi Y, Le Bot A, Hamon A, Gouze H, et al. Post-discharge persistent symptoms and health-related quality of life after hospitalization for COVID-19. *J Infect.* 2020;81(6):e4-6.
13. Demeco A, Marotta N, Barletta M, Pino I, Marinaro C, Petraroli A, et al., Rehabilitation of patients post-COVID-19 infection: a literature review. *J Int Med Res.* 2020;48(8):0300060520948382.
14. Amdal CD, Pe M, Falk RS, Piccinin C, Bottomley A, Arraras JI, et al., 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;30(12):3367-81.
15. Hegde S, Sreeram S, Bhat KR, Satish V, Shekar S, Babu M. Evaluation of post-COVID health status using the EuroQol-5D-5L scale. *Pathog Glob Health [Internet].* 2022 Nov 17;116(8):498-508.
16. Naik S, Haldar SN, Soneja M, Mundadan NG, Garg P, Mittal A, et al. Post COVID-19 sequelae: A prospective observational study from Northern India. *Drug Discov Ther.* 2021 Nov;15(5):254-60.
17. Anjana NKN, Annie TT, Siba S, Meenu MS, Chintha S, Anish TSN. Manifestations and risk factors of post COVID syndrome among COVID-19 patients presented with minimal symptoms - A study from Kerala, India. *J Fam Med Prim care.* 2021;10(11):4023-9.
18. Uniyal N, Sethi Y, Sharma PC, Sayana A, Jeet N, Agarwal A, et al. Post-COVID Syndrome and Severity of COVID-19: A Cross-Sectional Epidemiological Evaluation From North India. *Cureus.* 2022 Jul;14(7):e27345.
19. Cullen W, Gulati G, Kelly BD. Mental health in the COVID-19 pandemic. *QJM An Int J Med.* 2020;113(5):311-2.
20. Pfefferbaum B, North CS. Mental health and the Covid-19 pandemic. *N Engl J Med.* 2020;383(6):510-2.
21. Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, et al., Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China. *Int J Environ Res Public Health.* 2020;17(5):1729.
22. Xiang Y-T, Yang Y, Li W, Zhang L, Zhang Q, Cheung T, et al. Timely mental health care for the 2019 novel coronavirus outbreak is urgently needed. *The lancet psychiatry.* 2020;7(3):228-9.
23. Mazza MG, De Lorenzo R, Conte C, Poletti S, Vai B, Bollettini I, et al., Anxiety and depression in COVID-19 survivors: Role of inflammatory and clinical predictors. *Brain Behav Immun.* 2020;89:594-600.