

## ORIGINAL ARTICLE

## A follow up study of discharged COVID-19 patients admitted at tertiary care hospital of Ahmedabad city

Mansi Patel<sup>1</sup>, Hardika Khanpara<sup>2</sup>, Arpit Prajapati<sup>3</sup>, Parth Thakar<sup>4</sup>

<sup>1</sup>Assistant Professor, GCS Medical College, Hospital & Research Centre, Ahmedabad; Gujarat; <sup>2</sup>Assistant Professor, GCS Medical College, Hospital & Research Centre, Ahmedabad, Gujarat; <sup>3</sup>Associate Professor, GCS Medical College, Hospital & Research Centre, Ahmedabad, Gujarat; <sup>4</sup>Post graduate Student, GCS Medical College, Hospital & Research Centre, Ahmedabad

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### Corresponding Author

Dr. Arpit C Prajapati, 22, Sapphire Bungalow, Near Coral Bungalows, Opp. Anmol Apartment, Nana Chiloda, Ahmedabad - 382330  
E Mail ID: [doc.arpitprajapati@gmail.com](mailto:doc.arpitprajapati@gmail.com)



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### Abstract

**Introduction:** Though there is limited information on late sequelae of COVID-19, reports of persistent symptoms in persons who recovered from COVID-19 illness have emerged. The most frequently reported symptoms include fatigue, shortness of breath, cough. **Objectives:** 1.To identify the persistence or development of various symptoms among discharged COVID-19 patients 2.To study the outcome of COVID-19 infection after one month of discharge 3.To assess the difference in the quality of life pre and post COVID-19 status of study participants by using EuroQol Visual Analogue scale. **Material & Methods:** A Longitudinal study was carried out among all discharged confirmed COVID-19 patients aged more than 18 years and above in 1st December 2020 to 31st December 2020. 50% of patients discharged in December 2020 were selected by simple random sampling method. Status of present symptoms at the time of discharge and after one month of discharge were taken through telephonic interview. **Results:** COVID-19 patients had persistent symptoms like fatigue, cough, & anosmia respectively at the time of discharge. 7 (4.6%) patients found dead at the time follow up after one month. According to EQ-VAS, 79 (52.3%) COVID-19 patients perceived improved quality of life at the time of follow up one month after discharge as compare to the time of discharge. **Conclusion:** There is significant improvement in quality of life seen among the patients at the time of follow up than at the time of discharge. At the time of follow up, 4.6% deaths observed and some patients had persistent symptoms like fatigue, dyspnea.

### Keywords

COVID-19; Symptoms; EQ-VAS; Fatigue.

### Introduction

SARS-CoV-2 Coronavirus is causing a new disease called COVID-19, with new information being known on an active basis about the natural history of the disease, especially in terms of after recovery. After acute COVID-19 illness, recovered patients may continue to report wide variety of signs and symptoms including fatigue, body ache, cough, sore throat, difficulty in breathing, etc. There is limited evidence of post COVID-19 sequelae and further research is required and is being actively pursued. A support is required through holistic approach for follow up care and well-being of all post COVID-19 recovering patients.(1)

Confirmed case of SARS-CoV-2 infection is either person with a positive Nucleic Acid Amplification Test (NAAT) or person with a positive SARS-CoV-2 Antigen-RDT and meeting either the probable case definition or suspect criteria or an asymptomatic person with a positive SARS-CoV-2 Antigen-RDT who is a contact of a probable or confirmed case. (2)

In peer-reviewed refereed journal and open public discussion, persistent symptoms are being reported among COVID-19 survivors, including individuals who initially experience a mild acute illness. These persistent symptoms pose new challenges to patients, healthcare providers, and public health practitioners. The natural

history of SARS-CoV-2 infection and COVID-19 is a current area of investigation, and the prevalence, type, duration, and severity of persistent symptoms following resolution of acute SARS-CoV-2 infection, as well as risk factors associated with their development, are currently being studied.(3,4)

Most people with COVID-19 experience mild symptoms or moderate illness. Approximately 10-15% of cases progress to severe disease, and about 5% become critically ill. Typically people recover from COVID-19 after almost 1 to 2 months. For some people, some symptoms may linger or recur for weeks or months following initial healing. This can also happen in people with mild disease. People are not infectious to others during this time. Some COVID-19 patients develop medical complications that may have long lasting health effects. There are many case reports from people who do not regain their previous health following COVID-19.(5) In a telephone survey of symptomatic adults who had a positive outpatient test result for SARS-CoV-2, 35% had not returned to their usual state of health when interviewed 2–3 weeks after testing.(6)

Though there is limited information on late sequelae of COVID-19, reports of persistent symptoms in persons who recovered from acute COVID-19 illness have emerged. The most frequently reported symptoms include fatigue, shortness of breath, cough, joint pain, and chest pain. Other rare reported symptoms include cognitive impairment, depression, myalgia, headache, fever, and palpitations. More serious complications appear to be less common but have been reported. These complications include Cardiovascular (myocardial inflammation, ventricular dysfunction), Respiratory difficulty (pulmonary function abnormalities), Renal (acute renal injury), skin problems (rash, alopecia), Neurological (olfactory and gustatory dysfunction, sleep dysregulation, altered cognition, memory impairment), Psychiatric: depression, anxiety, changes in mood. (3,4)

There are limited research study found and information on late sequelae of COVID-19 is also limited, reports of persistent symptoms in persons who recovered from acute COVID-19 illness have emerged.(5) So, more studies are required to unravel the possible mechanism of COVID-19 infection and the after-effects of it to understand the characteristics of the virus and to develop the necessary preventive measures to prevent it. The present study was conducted to identify the development of various symptoms among recovered COVID-19 patients admitted at tertiary COVID-19 Hospital in Ahmedabad city.

### Aims & Objectives

1. To identify the persistence or development of various symptoms among discharged COVID-19 patients
2. To study the outcome of COVID-19 infection among study participants after one month of discharge

3. To assess the difference in the quality of life pre and post COVID-19 status of study participants by using EuroQol Visual Analogue scale.

### Material & Methods

**Study Type:** - Longitudinal study

**Study Population:** - Confirmed COVID-19 patient (RT-PCR / Rapid Antigen Test / radiologically by HRCT)

**Study Unit:** - Discharged COVID-19 patients from tertiary care COVID-19 hospital

**Sampling Frame:** All discharged COVID-19 patients from 1st December 2020 to 31st December 2020

**Study Sample:** 50% of patients (151) discharged in the month of December 2020 selected by simple random sampling method. Out of total 302 COVID-19 patients admitted in December 2020, 151 patients were selected through simple random sampling.

**Inclusion Criteria:** - Study participants aged more than 18 years and above

**Exclusion Criteria**

1. Study participants who are not willing to participate
2. Study participants who are not traceable by telephonic mode

**Study Duration:** - One month

**Data Collection and Analysis:** Data was collected by using pre tested & predesigned questionnaires through telephonic interview. Eligible COVID-19 patients were called to solicit interest in the study and only interested patients were enrolled over the phone for data collection. After obtaining verbal informed consent, the telephonic interview was taken of included study participants after discharge and one month after discharge from tertiary care COVID-19 hospital and data were entered in google form. The Euro-Qol visual analog scale was used to ask patients to score their quality of life from 0 (worst imaginable health) to 100 (best imaginable health) before COVID-19 and at the time of the follow up. A difference of 10 points defined worsened quality of life.(6) Collected data exported in MS Excel and analyzed using Epi Info™ Version 7.2. Continuous variables were described by mean with standard deviation (SD) and Categorical variables were described as percentage (%). Ethical approval for the study was taken from the relevant Institutional Ethics Committee (IEC).

### Results

In the current study, as shown in [Table 1](#) out of total 151 study sample, 60.9% were male and 91.4% were residing in urban area. 95.4% were discharged from the COVID-19 infection. 88.1% were non-smokers amongst study sample. 4.6% deaths occurred within one month of discharge from Hospital. Hypertension (19.9%) and Diabetes (14.6%) were found in study sample. 88.1% were nonsmokers in study sample.

Mean age group of study participants was 61.15 + 11.8 years. Mean duration of stay in particular hospital was 11.6 + 7.2 days. The difference found in EQ-VAS was 12.3

+ 16.7 at the time of discharge to after one month of discharge.

As depicted in [Table 2](#), Persistent symptoms found in study sample like fatigue (30.5%), cough (16.6%), shortness of breath (15.2%) & anosmia (15.2%) at the time of discharge and fatigue (11.8%), cough (5.6%), shortness of breath (8.3%) & anosmia (4.9%) after one month of discharge. Others includes red eyes, dysgeusia, sore throat, appetite loss, vertigo, myalgia, mucormycosis.

Total 7 (4.6%) patients found dead at the time follow up after one month. According to EQ-VAS, 79 (52.3%) COVID-19 patients perceived improved quality of life at the time of follow up one month after discharge as compare to the time of discharge.

## Discussion

In the current study, symptoms like fatigue (11.8%), cough (5.6%), shortness of breath (8.3%) & anosmia (4.9%) found after one month of discharge. In the similar studies, it was found that persistent fatigue in 39–72% of study participants.(7) Breathlessness or shortness of breath was reported by 67% studies, ranging from 39 to 74%.(8) An increased risk of specific clinical sequelae after the acute infection was noted across a range of organ systems, including cardiovascular, neurologic, kidney, respiratory, and mental health complications.(9)

As shown in [Table 3](#), fatigue, anosmia and joint pain slightly more common in males and shortness of breath, chest pain and cough were more common in females. Some symptoms were persistence from the time of discharge to one month of discharge like fatigue (8.6%), shortness of breath (7.3%) and cough (5.3%). Excess chance for new clinical sequelae after acute COVID-19 seldom differed between male and female, apart from fatigue and anosmia (more frequently diagnosed in females) and myocarditis, hypercoagulability, deep vein thrombosis (DVT), renal injury, and sleep apnea (more frequently diagnosed in males).(9) Study conducted in health care workers found overwhelming fatigue with altered sleep, persistent headaches are prominent features in post viral syndromes.(10) Long COVID-19 encompasses a wide range of symptoms and clinical findings that can occur in people with varying degrees of illness from acute SARS-CoV-2 infection, including patients who had mild or asymptomatic SARS-CoV-2 infection. Most common reported persisting symptoms include fatigue, difficulty thinking or concentrating (brain fog), difficulty breathing (with and without abnormal imaging and pulmonary function testing), cough, painful joints or muscles, chest pain, depression or anxiety, headache, fever, palpitations, loss of smell or taste dizziness on standing.(11) Similar other study conducted in tertiary hospitals of Henan Province showed that on the day of follow up after 3 months, the presenting symptoms included gastrointestinal symptoms (30.91%), headache

(18.18%), fatigue (16.36%), exertional dyspnea (14.55%), and cough and sputum (1.81%).(12)

In the other study, the risk for incident sequelae increased with age, pre-existing conditions.(9) As mentioned by Centre for Disease Control and Prevention (CDC), older patients and those with underlying health conditions might have an increased risk for severe disease, young people, including those who were physically fit before SARS-CoV-2 infection, have also reported symptoms lasting several months after acute illness.(13)

## Conclusion

There is significant improvement in quality of life seen among half of the patients at the time of follow up than at the time of discharge. Also there were persistent symptoms like Shortness of breath, joint pain, chest pain among the discharge patients. However, at the time of follow up after one month, 4.6% deaths observed. Symptoms like fatigue (11.8%), cough (5.6%), shortness of breath (8.3%) & anosmia (4.9%) found after one month of discharge. Some of the patients had persistence of symptoms like fatigue, dyspnea, cough. Regular follow-up post COVID-19 is indicated for assessment for the persistence of sequelae and prevention of complication.

## Recommendation

There should be consideration of the persistent symptoms while implementing community-based programme to improve quality of life of COVID-19 patients after discharge. Policymakers and health care workers should try to form strong guideline for improvement of the persistent symptoms and quality of life (QoL) of survivors of COVID-19.

## Relevance of the study

This study provides the scientific evidence on persistent symptoms and quality of life of survivors of COVID-19 after discharge. This study results will add the evidence of post COVID-19 sequel globally.

## Authors Contribution

All authors contributed equally.

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**Tables**

**TABLE 1 DEMOGRAPHIC AND CLINICAL CHARACTERISTICS OF THE STUDY SAMPLE (N=151)**

Characteristics	Frequency (%)
<b>Gender</b>	
Male	92 (60.9)
Female	59 (39.1)
<b>Residence</b>	
Urban	138 (91.4)
Rural	13 (8.6)
<b>Outcome</b>	
Recovered	144 (95.4)
Death	07 (4.6)
<b>Comorbidity</b>	
Hypertension	30 (19.9)
Diabetes	22 (14.6)
Coronary Heart Disease	1 (0.7)
C.O.P.D./ Asthma	1 (0.7)
None	68 (45)
<b>Smoking status</b>	
Non smoker	133 (88.1)
Current smoker	6 (4)
Past smoker	12 (7.9)

**TABLE 2 SYMPTOMS PRESENT AT THE TIME OF DISCHARGE AND AFTER ONE MONTH OF DISCHARGE**

Symptoms	Symptoms present	At the time of Discharge (n=151) Frequency (%)	After one month of Discharge (n=144) Frequency (%)	Chi-square test (P value)
<b>Fatigue</b>	Yes	46 (30.5)	17 (11.8)	15.3 (0.000093)
	No	105 (69.5)	127 (88.2)	
<b>Shortness of breath</b>	Yes	23 (15.2)	12 (8.3)	3.35 (0.067)
	No	128 (84.8)	132 (91.7)	
<b>Joint pain</b>	Yes	07 (4.6)	02 (1.4)	2.62 (0.10)
	No	144 (95.4)	142 (98.6)	
<b>Chest Pain</b>	Yes	11 (7.3)	06 (4.2)	1.31 (0.25)
	No	140 (92.7)	138 (95.8)	
<b>Cough</b>	Yes	25 (16.6)	08 (5.6)	8.97 (0.0027)
	No	126 (83.4)	136 (94.4)	

Symptoms	Symptoms present	At the time of Discharge	After one month of Discharge	Chi-square test (P value)
		(n=151) Frequency (%)	(n=144) Frequency (%)	
Anosmia	Yes	23 (15.2)	07 (4.9)	8.67 (0.0032)
	No	128 (84.8)	137 (95.1)	
Rhinitis	Yes	07 (4.6)	03 (2.1)	1.47 (0.225)
	No	144 (95.4)	141 (97.9)	
Headache	Yes	13 (8.6)	02 (1.4)	7.96 (0.0048)
	No	138 (91.4)	142 (98.6)	
Others	Yes	42 (27.8)	19 (13.2)	---

**TABLE 3 GENDER WISE PRESENCE OF SYMPTOMS AMONG STUDY PARTICIPANTS**

Symptoms after one month of discharge	Symptoms present	Gender		Chi square test (p value)
		Male (frequency, %) (n=92)	Female (frequency, %) (n=59)	
Fatigue	Yes	11 (12)	06 (10.2)	0.11 (0.734)
	No	81 (88)	53 (89.8)	
Shortness of breath	Yes	07 (7.6)	05 (8.5)	0.04 (0.847)
	No	85 (92.4)	54 (91.5)	
Chest Pain	Yes	03 (3.3)	03 (5.1)	0.31 (0.575)
	No	89 (96.7)	56 (94.9)	
Cough	Yes	02 (2.2)	06 (10.2)	4.58 (0.032)
	No	90 (97.8)	53 (89.8)	
Anosmia	Yes	04 (4.3)	03 (5.1)	0.04 (0.833)
	No	88 (95.7)	56 (94.9)	
Rhinitis	Yes	02 (2.2)	01 (1.7)	0.04 (0.836)
	No	90 (97.8)	58 (98.3)	
Headache	Yes	01 (1.1)	01 (1.7)	0.10 (0.749)
	No	91 (98.9)	58 (98.3)	
Others	Yes	12 (14.1)	06 (10.2)	---