

# Spectrum of Residual Symptoms in Post COVID Patients

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## ABSTRACT

**Background:** There are limited studies regarding post-COVID-19 infection patient's health status. **Objective:** To analyze the prevalence of post COVID-19 residual symptoms in local population of Faisalabad. **Study Design:** Cross sectional study. **Settings:** This study was conducted in Govt. General Teaching Hospital, GM Abad / Faisalabad Medical University, Faisalabad Pakistan. **Duration:** Over a period of 6 months. **Methods:** 212 patients fulfilling inclusion and exclusion criteria were enrolled in the study after obtaining a written informed consent. Demographics, relevant history, symptoms at presentation, date / duration since discharge from hospital, symptoms present on follow up date, severity of disease and treatment given were recorded for the patients discharged from the hospital in last 4 months. **Results:** Out of 212 COVID-19 patients, 56.6% were male and 43.4% were females Mean length of Hospital stay and mean time to follow up was 6.8 days and 88 days respectively. 94.3% patients returned to baseline functional status and jobs after recovery while 5.7% could not return to baseline functional status. 56.6% patients reported no post covid residual symptoms. Most frequently reported symptoms after covid recovery were Fatigue 24.5%, Depression 22.6% and Body Pains 20.8%. Fever, cough and dyspnea were reported in 11.3%, 17% and 3.8% respectively. **Conclusion:** Despite apparent recovery from Covid-19 infection many patients still face a wide range of post covid symptoms months after initial infection.

**Keywords:** Post covid-19, Residual symptoms, Quality of life.

## INTRODUCTION

As per the World Health Organization (WHO), viral diseases are emerging as serious public health issues. In the last twenty years, many epidemics like severe acute respiratory syndrome coronavirus (SARS-CoV) from 2002 to 2003, and H1N1 influenza in 2009, have been recorded. Most recently SARS-CoV2 was detected for the first time in Wuhan, China in December 2019. On February 11, 2020, the WHO named this disease as "COVID-19". This new virus is very contagious and has rapidly spread across the world. On 30<sup>th</sup> January 2020, this outbreak was declared a Public Health Emergency of International Concern (PHEIC) by the WHO. On March 11, as the number of COVID-19 cases outside China increased 13 times and more than 114 countries were involved, COVID-19 was declared a pandemic by WHO.<sup>1</sup>

To date (Jan 26, 2023) Pakistan has 1,576,221 confirmed cases of COVID-19 with total death toll of 30,640 so far.<sup>2</sup>

Majority of patients with COVID-19 recovered uneventfully. In approximately 19% there was progressive worsening leading to severe pneumonia and critical pneumonia in 14% and 5% of patients respectively.<sup>3</sup> This novel coronavirus, has since spread rapidly worldwide. While much attention has been focused on the acute symptoms and transmission of the virus, there is also rising concern about the long-term effects of Covid-19 on patients after recovery. Some people are reporting persistent symptoms, such as fatigue, shortness of breath, and cognitive difficulties, which are impacting their quality of life.<sup>4</sup>

A study published in JAMA about persistent symptoms in Italian population have reported that about 87.4% of

patients had persistence of at least 1 symptom, particularly fatigue and dyspnea after recovery from COVID-19 infection.<sup>5</sup> Little data about long term complications after recovery from clinically significant COVID-19 disease is available so far.<sup>6</sup> These findings highlight the long-term effects of COVID-19 on patients even after they have recovered from the initial infection. It is crucial for health professionals to monitor and address these persistent symptoms in order to provide appropriate care and support for patient's post-recovery. Additionally, further research is required to fully comprehend the impact of COVID-19 on long-term health outcomes.<sup>7</sup>

Post-Covid syndrome, also known as long Covid, is a phenomenon that has been increasingly recognized as a significant issue, with a growing number of patients reporting a variety of lingering symptoms that can significantly impact their quality of life.<sup>8</sup> A study done in United Kingdom, United States of America, and Sweden on more than 4000 COVID-19 patients reported that 12-16% of patients had symptoms lasting >28 days.<sup>9</sup> In this study, we aim to further explore the prevalence and nature of these post-Covid residual symptoms in Pakistani population and shedding light on the long-term effects of the virus on individuals' health and well-being.

## METHODS

This is a cross sectional prospective study that was conducted in department of medicine at Faisalabad Teaching Hospital, Ghulam Muhammad Abad, Faisalabad over a period of 6 months from June 2021 to November 2021. After approval from ethical review committee with registration no. 1053, 212 patients fulfilling the exclusion and inclusion criteria were called to Faisalabad Teaching Hospital, GM Abad, Faisalabad and enrolled into the study after obtaining a written informed consent. Demographics including age & gender, relevant history, symptoms at presentation, date / duration since discharge / recovery from hospital, symptoms present on follow up date, severity of disease at presentation and treatment given were recorded for the patients discharged from Faisalabad Teaching Hospital, GM Abad, Faisalabad in last 4 months.

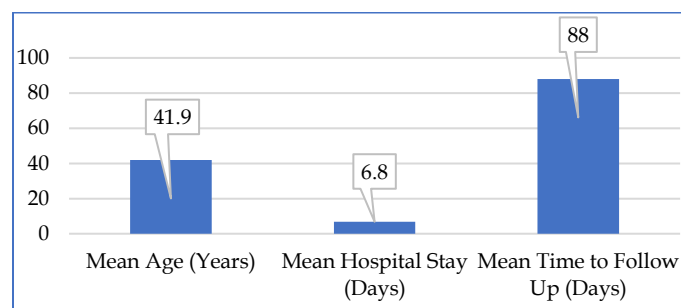
Inclusion criteria (All patients with age between 18 to 80 years, who came for follow up within 30-120 days of discharge, both genders, COVID-19 PCR positive or radiologically COVID-19, mild / moderate / severe / critical respiratory disease). Exclusion criteria (Age less than 18, asymptomatic COVID-19 patients, patients who had symptoms that were explainable with other co morbidity). A detailed questionnaire about residual Covid related symptoms was filled from each patient. All the data was processed and analyzed using SPSS 20 for Windows. Mean  $\pm$  Standard Deviation was calculated for

Quantitative variables like age of the patients. Frequency and percentages were calculated for Qualitative Variables like different symptoms present at the follow up, Gender, Co morbidities, Stages of Severity of disease.

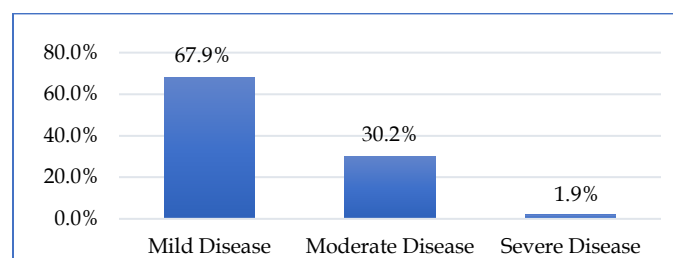
## RESULTS

Total of 212 COVID-19 patients who were included in the study and their post covid-19 recovery symptoms were recorded prospectively, 120 were male (56.6%) and 92 females (43.4%). Minimum age was 18 years and maximum age 80 years with mean age of 41.9 years. Mean length of Hospital stay and mean time to follow up was 6.8 days and 88 days respectively. At the time of presentation 144 (67.9%) had mild disease, 64 (30.2%) had moderate disease and 04 (1.9%) had severe respiratory disease. Only 04 (1.9%) patients were put on high flow nasal cannula, none of the patients were being put on ventilator. Out of 212 patients 156 (73.6%) had no comorbidities. Among remaining 26.4% patients, comorbidities were (DM 9.4%, HTN 5.7%, IHD 1.9%, Thyroid disease 1.9%, Smoking 5.7% and CKD 1.9%). A total of 120 (56.6%) patients received steroids, 04 (1.9%) patients were given remdesivir and tocilizumab. 200 (94.3%) patients out of 212 returned to baseline functional status and jobs after discharge from hospital, 5.7% could not return to baseline functional status and job after covid-19. Patients reported persistence of following symptoms after post covid recovery (Fever 11.3%, Fatigue 24.5% as per fatigue severity score, Dyspnea 3.8% as per ATS definition, Cough 17%, Sputum 5.7%, Rhinitis 3.8%, Sore throat 9.4%, Anosmia 7.5%, Headache 5.7%, Lack of Appetite 9.4%, Joint Pain 1.9%, Body Pains 20.8%, Diarrhea 1.9% and Depression 22.6%). 120 out of 212 patients that is 56.6%, reported no post covid residual symptoms.

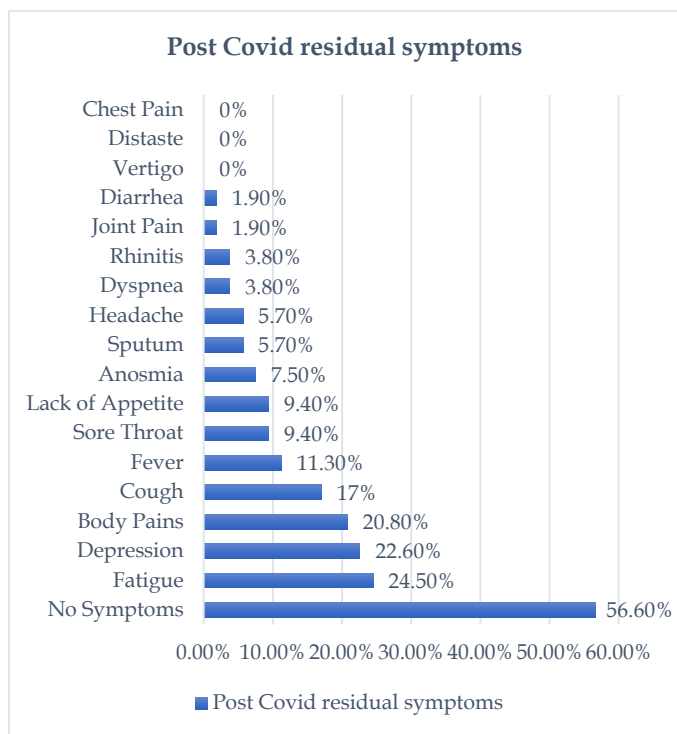
**Figure 1: Mean age, hospital stay & time to follow up**



**Figure 2: Percentage of severity of disease**



**Figure 3: Post COVID residual symptoms**



**DISCUSSION**

Covid-19 being a viral infection became pandemic & has drawn attention of the whole world. The epidemic is over but sporadic cases are still being reported. Now an era of post covid complications & residual symptoms have started. Spectrum of residual symptoms in viral infections varies from fatigue, lethargy to neuromuscular weakness & sometimes death.<sup>5</sup> In the aftermath of COVID-19, a large number of symptoms persist, constituting a syndrome called "long COVID-19" or "post-COVID- 19".<sup>10</sup> Persistence of symptoms in post-COVID-19 infection is a significant issue, affecting nearly one in five individuals.<sup>11</sup>

The data from our study shows a wide range of post-COVID symptoms, with body pains and depression being the most reported. However, it is reassuring to note that over half of the patients (56.6%) reported no residual symptoms. The discussion highlights the ongoing impact of COVID-19, with sporadic cases still being reported and an era of post-COVID complications emerging. It emphasizes the importance of understanding and addressing the spectrum of residual symptoms that can occur following viral infections. In one study of 128 participants more than half of patients reported persistent fatigue 52.3%; 45/128) as compared to 24.5% in our study.<sup>12</sup>

In our study overall prevalence of post covid residual symptoms is 43.4% which is consistent with the data reported from other continents like Europe 44% and

North America 31%.<sup>13</sup> Though prevalence of post covid syndrome symptoms in one study that was conducted in Jordan is as high as 83%.<sup>14</sup>

In this study fatigue and body pains are the commonest symptoms like other viral infections. But in Covid-19 follow up cases, these symptoms were severe and prolonged, most probably due to associated depression. The depression was commonly seen in these patients because of fear of death and socioeconomic deprivation.<sup>15</sup>

A systematic review published in Journal of Clinical Medicine by Jennings, G., Monaghan *et al* in 2021 showed fatigue in 44%, sleep disorder in 33%, dyspnea in 40% and cough in 22% of patients as post covid symptom. Anxiety and depression were reported to be 34% and 32% respectively. Decreased quality of life was reported by 57% of patients in this study.<sup>16</sup>

A similar study on post covid residual symptoms was done by Carfi A, Bernabei R, Landi F *et al* in 2020. According to this study no residual symptoms were reported by 12.6% patients as compared to 56.6% in our study. Frequency of fatigue was 53.1% as compared to 24.5% in our study. 43.4% reported dyspnea compared to 3.8% in our study. Joint pains and body pains were 27.3% and 7.5% as compared to 1.9% and 20.8% respectively.<sup>5</sup>

Geographical and ethnic differences result in variation of prevalence of most common post covid symptoms. A study conducted in Jordan in 2021 showed most prevalent post covid symptom as mood disturbance / depression in 59.4% patients with fatigue and anxiety in 56.4% and 47.3% respectively.<sup>14</sup> In our study first 3 most prevalent symptoms are fatigue, depression and myalgia as 24.5%, 22.6% and 20.8% respectively.

Another study on post covid symptoms conducted in Saudi Arabia in 2021 by Khodeir MM, Shabana HA, Rasheed Z *et al* reported general fatigue in 73%, Mood changes in 41%, Insomnia in 39% of patients. It was an online cross sectional-based survey. Cough, Dyspnea and loss of appetite were reported to be 47%, 43% and 42% respectively.<sup>7</sup>

It is important to note that while many individuals may recover fully from COVID-19, a significant portion continue to struggle with ongoing symptoms that can impact their quality of life. As shown in our study, Carfi A, Bernabei R, Landi F *et al* and Khodeir MM, Shabana HA, Rasheed Z *et al*.<sup>5,7</sup> As we continue to learn more about the long-term effects of this virus, it is crucial to provide support and resources for those dealing with post-Covid complications.

A multicenter study published in Science in 2024 by Carlo Cervia-Hasler *et al* highlighted the role of increased complement activation and thromboinflammation in

Long Covid. Analysis of >6500 proteins in 268 longitudinal samples revealed dysregulated activation of the complement system in individuals experiencing Long Covid. Thus, active Long Covid was characterized by terminal complement system dysregulation and ongoing activation of the alternative and classical complement pathways.<sup>17</sup>

## CONCLUSION

It is concluded that despite apparent recovery from Covid-19 infection many patients still have a wide range of post covid symptoms months after initial infection. Healthcare professionals must be aware of these residual post Covid-19 symptoms in order to provide better care to Covid-19 patients after recovery.

## LIMITATIONS

It was a single center study with small sample size. There was lack of information on symptom history before acute covid-19 illness and lack of details on symptom severity. We could not continue study in 3<sup>rd</sup> and 4<sup>th</sup> wave of covid-19 when more effective antiviral treatments were readily available for treatment. More such studies with large sample size and different ethnicity needs to be done in future, especially in patients who had timely interventions in the form of antivirals and other medicines.

## SUGGESTIONS / RECOMMENDATIONS

More such studies with bigger sample size and extended follow up after recovery from covid-19 is required in future.

## CONFLICT OF INTEREST / DISCLOSURE

There was no conflict of interest.

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