

January 2023

## Exploring the Prevalence of Long-Covid and its Factors among Post-Covid Survivors of Karachi

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### Recommended Citation

Majeed S, Khan IA, Tariq T. Exploring the Prevalence of Long-Covid and its Factors among Post-Covid Survivors of Karachi. Allied Med Res J. 2023;1(1):58-69. Available from:

<http://ojs.amrj.net/index.php/submissions/article/view/40>.

**Abstract**

Long COVID or post-COVID problems are long-term effects of COVID-19 infection that certain people who have contracted the virus can experience. This may result in having persistent symptoms for 3 months or more, such as those who had tiredness, malaise, changed smell and taste, dyspnea, and cognitive deficits three or more months after their initial COVID-19 diagnosis. However, some people may still have inferior work performance and a lower quality of life due to the long COVID episodes. From October 2021 to April 2022, cross-sectional research was conducted in Karachi, utilizing an electronic questionnaire to record sociodemographic data, current comorbidities, and previous episodes of acute COVID-19, post-COVID symptoms, and job performance among COVID survivors. The study's findings revealed that more than 35% of individuals surveyed claimed to have had COVID symptoms for six weeks or more, with approximately 20% to 30% of those reporting frequent coughing and appetite loss. Planning prevention, rehabilitation, and clinical treatment need an awareness of long-term COVID and its related components in order to maximize recovery and long-term COVID-19 outcomes.

**Keywords**

*COVID-19, Symptoms, Medical professionals, Work performance*

## Introduction

Long COVID or post-COVID problems are long-lasting consequences of COVID-19 infection that certain persons who have contracted the virus that causes them can endure. The Americans with Disabilities Act (ADA) introduced “long COVID” as a recognized condition that might lead to a disability in July 2021<sup>1</sup>. Between June 2022 and January 2023, 11% to 19% of COVID patients reported having persistent COVID symptoms, according to data collected from US residents<sup>2</sup>. Although there is conflicting evidence regarding whether vaccines reduce the risk of developing long COVID or the severity of it in those who already have it, only 15% of the US population has received all recommended vaccines. As a result, there is still a great deal of uncertainty regarding long COVID cases that follow post-COVID conditions<sup>2-3</sup>.

Additionally, among those who have experienced COVID, the long-term COVID remains high. In addition, an estimated 7.5% of adults, including those with tiredness, malaise, changed smell and taste, dyspnea, and cognitive deficits continued to experience persistent symptoms three or more months following their initial COVID-19 diagnosis<sup>4-7</sup>. The severity of this collection of symptoms is getting worse. The majority of patients experienced satisfactory physical and functional recovery during follow-up, and the majority of those who were employed prior to COVID-19 resumed their prior positions. However, some people may still have inferior work performance and a lower quality of life due to the long COVID episodes<sup>8-9</sup>. Only a few studies in Asian nations had sufficient sample sizes, which hampered the ability to make conclusions on COVID’s long-term effects in this region. In one Indian study, long COVID was found in 29.2% of patients, 23.4% with mild or moderate cases, and 62.5% with severe or critical cases. The current UK study, in contrast, was unable to identify any protective benefits of receiving two doses of the COVID-19 vaccination<sup>10</sup>. Another northern research suggested that 22% of participants might acquire COVID<sup>11</sup>. A third research discovered that 32% of patients experienced a post-COVID phase and that 8% of patients continued to experience symptoms of COVID<sup>12</sup>. At 12 weeks, 16.1% of Bangladeshis had long-lasting COVID symptoms, with tiredness being the most prevalent<sup>13</sup>. One month after contracting COVID-19 in Pakistan, 83.7% of patients reported symptoms, with body aches being the most prevalent<sup>14</sup>. The body of research

on the burden of long-term COPD is extensive. However, it is also somewhat constrained by the inclusion of only small-scale studies and the exclusion of specialist study groups and clinical investigations. Clinical investigations and patient-reported outcome assessments can provide further light on the underlying mechanisms and subsequent clinical treatment of long-term COVID. There has not been a recent large-scale study that outlines the incidence of SARS-CoV-2 infection symptoms and abnormal or impeded investigation in the general population<sup>13</sup>. Studies on long-term COVID have primarily been done on patients who have just been released from a hospital in Europe. A comprehensive evaluation found little evidence among non-hospitalized individuals from low- to middle-income nations<sup>14</sup>. Furthermore, there is no evidence available for Pakistan on whether COVID-19 survivors with lesser symptoms or those not admitted to hospitals had long-term COVID symptoms or what variables are connected with long-term COVID. Thus, we performed an online survey with Karachi COVID-19 survivors in the community to learn more about their long-term COVID symptoms and associated factors.

## **Methodology**

From October 2021 to April 2022, cross-sectional research was conducted in Karachi utilizing an electronic questionnaire designed on a secure, web-based software platform. The questionnaire was developed in English and translated into Urdu, Sindhi, and Punjabi to accommodate the multiethnic society. The following sections were included in the survey: sociodemographic data, current comorbidities, previous episodes of acute COVID-19, post-COVID symptoms and job performance. The questionnaire is only open to those between 18 and 50 who have had COVID-19 during the last two years and are now employed; it is not open to individuals who are unemployed/retired or who have withdrawn their agreement to participate in the survey.

The COVID-19 support group website, social media trending apps, email lists, and WhatsApp groups were all used to disseminate the survey to as many COVID-19 victims as possible. To maintain their anonymity, the target population's names, phone numbers, and email addresses were not acquired. However, the respondents were given the option of leaving their emails if the researchers considered that the comments needed to be referred for greater attention, for follow-

up or help needed. Survey results were exported into the SPSS version 23 software for data analysis. The median with interquartile range (IQR) or mean with standard deviation (SD) was used to present either customarily distributed or skewed data. The frequency with a percentage was used to show categorical variables.

## **Results**

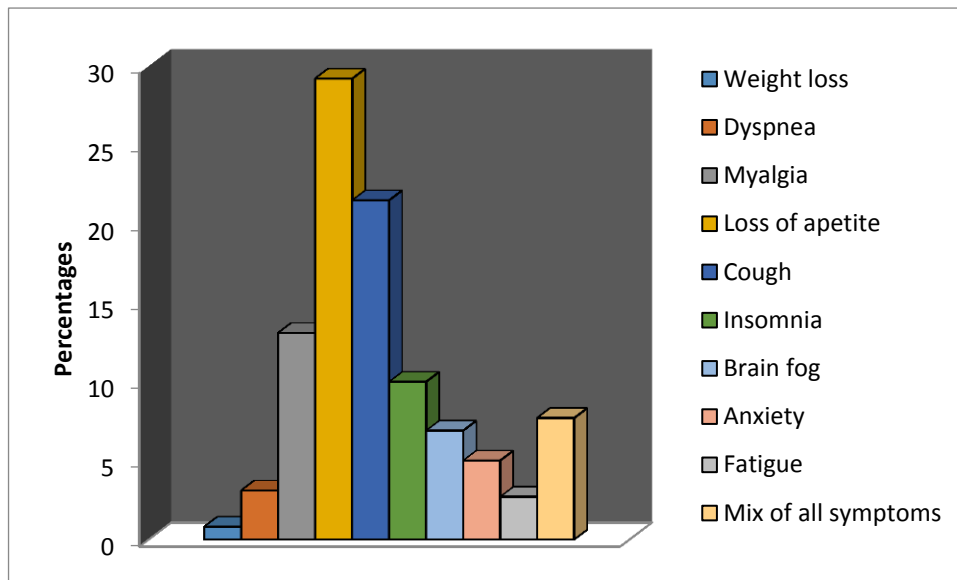
Through social media, COVID support groups, emails, and WhatsApp groups, a total of 500 questionnaires were distributed. 350 of them were returned, and 260 of them contained all the necessary information. The survey had 139 men (53.5%) and 121 women (46.5%) who were mainly between the ages of 26 and 33 (48.8%), bachelor's degree holders (31.9%), and intermediate (28.8%) as depicted in Table-1. Moreover, 48.1% reported no comorbidities while 41.9% had diabetes, and 6.2% hypertension. Amongst, 58.5% were reported to be smokers and 41.5 non-smokers%.

Table-1 Demographic characteristics of participants		
Variables		n (%)
<b>GENDER</b>	Males	139 (53.5)
	Females	121 (46.5)
<b>AGE GROUPS</b>	18-25	52 (20.0)
	26-33	127 (48.8)
	34-41	52 (20.0)
	42-50	29 (11.2)
<b>EDUCATION</b>	Secondary or lower	22 (8.5)
	Matriculation	48 (18.5)
	Intermediate	75 (28.8)
	Bachelors	83 (31.9)
	Master's degree	32 (12.3)

In acute COVID-related data, 155 people (59.6%) reported a booster dose, compared to 105 people (40.4%) who received just one shot. COVID symptoms were reported as moderate by 38.8% of participants, mild by 24.6%, and absent by 20.4%. However, 36.2% were admitted to the COVID-19 care facility, and 45.8% said they managed their symptoms at home under quarantine as shown in Table-2.

Table-2 Acute COVID-19 data reported by participants		
Variables		n (%)
<b>VACCINATION</b>	One dose	105 (40.4)
	Booster shot	155 (59.6)
<b>SYMPTOMS</b>	No symptoms	53 (20.4)
	Mild symptoms	64 (24.6)
	Moderate symptoms	101 (38.8)
	Severe symptoms with oxygen support	42 (16.2)
<b>MANAGEMENT</b>	Home quarantined	119 (45.8)
	Hospital admittance	47 (18.1)
	COVID-19 care facility	94 (36.2)

In long COVID data, it was found that 37.3% of patients had symptoms for more than six weeks, 35.8% for up to 6-weeks followed by 26.9% for more than 3-months. with 29.2% reporting appetite loss, 21.5% coughing, 13.1% myalgia, 10% insomnia, 6.9% brain fog, and 7.7% a combination of all symptoms (Figure 1).



*Figure-1 Long COVID symptoms reported by respondents*

In terms of health perception, 63.8% of people said their symptoms were no worse than they were before COVID, but 36.2% said they were worse than that, 51.5% said they were affected in job performance, and 38.8% said they had cut back on their working hours, 33.5% had quit, and 27.7% had taken time off.

## Discussion

The results of this study showed that young adults with bachelor's, master's, and doctoral degrees, as well as middle-aged and older adults, made up the majority of respondents. At the same time, those with less formal education were underrepresented. Additionally, slightly more men than women responded to the study. Low rates of comorbid conditions like hypertension were observed; however, diabetes was found in 41.9% and 48.1% of those with no comorbid conditions, respectively, as more than half of these individuals were in their twenties and thirties. About 60% of respondents reported being fully immunized at the time of the survey because our survey was conducted when booster vaccinations were widely available. However, we could not determine whether the respondents received their vaccinations before or after the diagnosis.



More than 35% of those polled reported having COVID symptoms for six weeks or longer. Six months after acute COVID-19, 76% of hospitalized patients reported at least one symptom, according to a cohort study<sup>17</sup>. Another study using linked data from 273,618 COVID-19 survivors' electronic health records discovered that one in three patients had one or more long-COVID symptoms recorded between three and six months after receiving a COVID-19 diagnosis<sup>18</sup>. According to a review, patients with a mild COVID-19 infection had persistent symptoms after three weeks, ranging from 10% to 35%. In contrast, more than 25% to 35% of the participants in our study reported having mild to moderate symptoms in their pre-COVID condition<sup>19</sup>. The differences in long-term COVID definitions, study settings, and patient characteristics may all impact the reported prevalence.

Several studies reported that the most commonly experienced symptoms of long-term COVID were fatigue, brain fog, depression, anxiety, insomnia, arthralgia, or myalgia<sup>20</sup>. Similar to these findings, more than 7% of respondents had a mix of all these symptoms in which almost 20% to 30% suffered loss of appetite and cough commonly. The long-term COVID symptoms' etiology is complex, and several mechanisms might be responsible for these varieties of symptoms. It appears that persistent inflammation plays a key role in the pathogenesis of long-term COVID symptoms.

While more than 20% of respondents had to cut back on their working hours, take time off, or even resign, more than 50% claimed that their job performance was damaged. Davis et al.<sup>21</sup> found that 45.2% of participants with long-term COVID needed a decreased work schedule compared to before their sickness, and an additional 22.3% were not working at the time of the survey owing to illness. In addition, Aiyegbusi et al.<sup>22</sup> noted that individuals employed before contracting the disease could not resume their jobs because of chronic symptoms. At the same time, those who could do so had to change their duties or reduce their hours owing to health issues. Additionally, some individuals had previously been hospitalized and were unable to work. Similar to this, 18% of our respondents said they had been admitted to the hospital, and more than 30% had been admitted to an acute care facility; this may be why they were more negatively impacted in their ability to function at work due to the protracted period of lingering

symptoms. Symptoms like brain fog or trouble concentrating may impact the productivity of those working in the accounting or teaching fields. It could take longer for these impacted people to function at their prior level. It should be highlighted that more than 30% of our respondents had long-term COVID, whether they had symptoms or mild to severe symptoms. In contrast to patients admitted to the hospital with serious infections, most patients with mild to moderate COVID infections are often treated as outpatients at home or in clinics. Therefore, if the patients do not seek treatment, the medical experts may not identify the post-COVID or long-term COVID symptoms. The long-term symptoms of COVID should be explained to these patients, and they should be urged to get treatment if necessary.

With advancing age, the frequency of long COVID almost doubled. People's capacity to control viral load declined as they became older. However, due to technology and a self-reported online questionnaire, the senior citizen age group was underestimated because most of our respondents were young. As researchers continue to study and comprehend more about them, the pathophysiology and mechanism underpinning the persistence of symptoms in long COVID, have yet to be found. To our knowledge, this is the first research that has described the symptoms, duration, and contributing factors of long-term COVID in Karachi. This may have major and long-lasting health and economic effects on a national basis. Thus, our research findings can aid in better planning for the utilization of pertinent medical resources.

## **Conclusion**

According to the study's findings, more than 35% of individuals surveyed claimed to have had COVID symptoms for six weeks or more, with approximately 20% to 30% of those reporting frequent coughing and appetite loss. Among COVID-19 survivors, this study provides further details on the symptoms and duration of post-COVID symptoms as well as the factors that contributed to Long COVID in Karachi. Planning prevention, rehabilitation, and clinical treatment need an awareness of Long COVID and its related components in order to maximize recovery and long-term COVID-19 outcomes.

### Authors Contribution

**Majeed S:** Conception, design and drafting.

**Khan IA:** Drafting and data acquisition.

**Tariq T:** Critical revision and final approval.

### Declaration of Interest

None.

### Funding Sources

None.

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