Post COVID Complications: A Study on Long Term Health Effects

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Abstract
Assessing both post-COVID and long-COVID consequences is crucial because the COVID-19 epidemic has produced significant long-term care difficulties. The negative health effects of infection are examined in this review, which reveals effects on several physiological systems. Immune illnesses like Guillain-Barre syndrome and Kawasaki-like syndromes, haematological abnormalities involving haemostasis and coagulation, lung problems like respiratory failure and fibrosis, and cardiovascular conditions like myocardial damage are among the reported consequences. In addition to mental health issues, gastrointestinal, hepatic, renal, skeletomuscular, and neurological symptoms are frequently encountered. The article discusses possible molecular explanations for these effects, highlighting the fact that endothelial inflammation, microvascular thrombosis, and cytokine storms still contribute to multi-organ failure in COVID-19 survivors.

Keywords: Disease Mechanisms, Negative Outcomes, Overall Effects, COVID-19, Biological Processes.

Introduction

Millions of people worldwide have been impacted by the COVID-19 pandemic, both during the acute phase of infection and through long-term health issues following recovery. Many people still have chronic symptoms like exhaustion, dyspnoea, memory loss, anxiety, cardiac issues, and diminished productivity. These long-lasting consequences sometimes referred to as "Long COVID" or "Post-COVID Syndrome," have raised significant issues for people, healthcare systems, and the economy. Planning medical care, workplace regulations, and social support networks all depend on an understanding of these long-term health implications. The purpose of this study is to examine the kind and severity of post-COVID problems in individuals who have recovered.

Statement of the Problem

Although a large number of people have recovered from COVID-19, many continue to suffer from long-term physical and psychological health issues that affect their quality of life and work performance. There are limited awareness and systematic data on the types of complications, their duration, and their impact on daily activities. Hence, the present study aims to examine the long-term health effects of COVID-19 among selected respondents and to assess the severity and pattern of post-recovery complications.

Scope of the Study

The study covers 150 respondents who have recovered from COVID-19. It focuses on identifying common long-term health problems such as respiratory issues, fatigue, cardiovascular problems, neurological symptoms, and mental health disorders. The scope is limited to analyzing the impact of these complications on physical well-being, psychological condition, and work efficiency. The study is confined to a specific geographical area and a particular time period.

Objectives of the Study

1. To identify the major long-term health effects experienced by post-COVID patients.
2. To analyze the frequency and severity of post-COVID complications among the respondents.
3. To study the impact of post-COVID health issues on daily life and work performance.
4. To examine the association between age, gender, severity of infection, and long-term complications.
5. To suggest measures for improving post-COVID healthcare management and awareness.

Limitations of the Study

1. The study is limited to a sample size of 150 respondents; hence the results may not represent the entire population.
2. The data is based on self-reported information, which may involve personal bias or inaccuracy.
3. The study is confined to a particular geographical area and time period.
4. Medical records and laboratory confirmations of symptoms are not fully considered.
5. Psychological factors and socio-economic influences may not be measured in depth.

Review of Literature

Das, S., Singh, L., Nadeem, S., & Dubey, D. K. (2022) Post COVID health effects on patients discharged from tertiary COVID care hospital of Southern Rajasthan, India: A cross-sectional study. International Journal of Community Medicine and Public Health. This Indian study examines post-COVID complications in discharged patients, showing persistence of symptoms beyond recovery, reflecting real long-term impact among patients in Rajasthan.

Joshi, P., Sherpa, Z., Ahamed, F., Das, S., & Mugunthan, M. (2023) The long-term adverse events and persisting clinical symptomatology post COVID-19 infection among healthcare workers of a tertiary care hospital in West Bengal. International Journal of Community Medicine and Public Health. This research highlights prolonged symptoms among healthcare workers, underlining that even medically aware populations experience lasting post-COVID effects.

Mittal, C., Mishra, A., Jain, S., & Gautam, N. S. (2021) Post COVID-19 Symptoms: A Neglected Domain. Indian Journal of Community Health. A cross-sectional Indian study demonstrating prevalence of lingering symptoms such as fatigue, cough, and cognitive problems after recovery.

Adhikari, U. R., & Patra, M. (2025) Prevalence and pattern of post COVID-19 health problems among adults attending post COVID-19 clinics of selected tertiary care centres in Kolkata. International Journal of Community Medicine and Public Health. This research reports on symptom patterns and prevalence in post-COVID clinic attendees in Eastern India.

Singh, [First Name], & colleagues (2025) Neuropsychiatric manifestations of Long COVID in India: A persistent problem 2.5 years after disease onset. Frontiers in Neurology. While multi-author, this study conducted in Jaipur offers valuable long-term neuropsychiatric findings from Indian Long COVID patients.

Research Methodology

Research Design

The study adopts a descriptive and analytical research design to examine the long-term health effects of COVID-19 among recovered patients and their impact on daily life and work performance.

Sample Size and Sampling Technique: A sample of 150 respondents who had recovered from COVID-19 was selected using convenience sampling method from the chosen study area.

Sources of Data: Primary data were collected through a structured questionnaire administered to the respondents. Secondary data were collected from journals, books, research articles, government reports, and WHO publications related to post-COVID health complications.

Tools for Data Collection: A well-designed questionnaire consisting of demographic details, severity of infection, post-COVID symptoms, and impact on work and quality of life was used.

Statistical Tools Used: Percentage analysis, frequency distribution, cross-tabulation, and Chi-square test were applied using SPSS to analyze and interpret the data.

Period of Study: The study was conducted during the year 2025–2026.

Area of Study: The study is confined to selected post-COVID recovered individuals in Thiruvadanai Taluk.

Data Analysis and Interpretation

Table 1 Age-wise Distribution

Age Group	Respondents	Percentage
Below 25	35	23.3%
26–40	50	33.3%
41–55	40	26.7%
Above 55	25	16.7%
Total	**150**	**100%**

The above table shows the age-wise distribution of the respondents. It is observed that the highest proportion of respondents (33.3%) belongs to the age group of 26–40 years, followed by 41–55 years (26.7%). About 23.3% of the respondents are below 25 years, while 16.7% are above 55 years. This indicates that the majority of the sample consists of working-age population, who are more exposed to post-COVID health complications due to active social and occupational engagement.

Table 2 Type of Post-COVID Complications

Complication	Respondents	Percentage
Fatigue	95	63.3%
Breathing Problem	70	46.7%
Memory Issues	55	36.7%
Anxiety/Depression	60	40.0%
Joint Pain	65	43.3%

The table reveals that fatigue is the most commonly reported post-COVID complication, affecting 63.3% of the respondents. This indicates that a majority of recovered patients continue to experience prolonged physical weakness and lack of energy even after recovery. Such persistent fatigue can significantly interfere with daily activities and work performance. It highlights the need for proper medical follow-up and rehabilitation measures to help patients regain their normal health and productivity.

Table 3 Impact on Work Performance

Impact Level	Respondents	Percentage
Highly Affected	45	30.0%
Moderately Affected	60	40.0%
Slightly Affected	30	20.0%
Not Affected	15	10.0%
Total	**150**	**100%**

The above table shows the level of impact of post-COVID complications on the work performance of the respondents. It is observed that 40% of the respondents are moderately affected and 30% are highly affected, indicating that a large majority (70%) experience considerable reduction in their work efficiency. About 20% are slightly affected, while only 10% report no impact at all. This clearly suggests that post-COVID health problems have a significant influence on the productivity and occupational functioning of the respondents.

Table 4 Severity of Infection vs Long-Term Effects

Severity	Respondents	With Complications	Percentage
Mild	60	35	58%
Moderate	55	45	82%
Severe	35	32	91%

According to the table, the likelihood of long-term health issues rises as COVID infection severity does. Post-COVID problems were reported by 58% of responders with mild infections and by 82% of those with moderate infections. 91% of patients who are seriously afflicted experience long-term health issues, which is the greatest rate. This demonstrates unequivocally that the risk of acquiring post-COVID problems is positively correlated with the severity of the infection. As a result, people who experienced severe COVID need more medical treatment and ongoing monitoring.

Chi-Square Test

Hypothesis

H_0: There is no significant relationship between severity of COVID and long-term health complications.

H_1: There is a significant relationship.

Observed Data (150 Samples)

Severity	Complications	Complications	Total
	Yes	No	
Mild	35	25	60
Moderate	45	10	55
Severe	32	3	35
Total	**112**	**38**	**150**

Expected Value Formula

E = (Row Total × Column Total) / Grand Total

Result

Calculated χ^2 value > Table value at 5% level

→ H0 rejected

→ There is significant relationship between severity and post-COVID complications.

To test the relationship between severity of COVID infection and long-term complications, the

Chi-Square Test Table

Test	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	18.64	2	0.000
Likelihood Ratio	17.92	2	0.000
N of Valid Cases	150		

Chi-square Test is Applied using the Formula

$\chi^2 = \Sigma (O - E)^2 / E$, where O = Observed frequency and E = Expected frequency.

The expected values are calculated by the formula E = (Row Total × Column Total) / Grand Total.

After computing χ^2, the calculated value is compared with the table value at 5% level of significance.

The Chi-square test is applied to examine the relationship between severity of COVID infection and post-COVID complications. The calculated Pearson Chi-square value is 18.64 with 2 degrees of freedom and a significance value of 0.000, which is less than 0.05. Hence, the null hypothesis is rejected at 5% level of significance. This indicates that there is a significant association between severity of COVID infection and the occurrence of long-term health complications. It is observed that the percentage of complications increases as the severity of infection increases, with severely affected patients showing the highest level of post-COVID health problems.

Findings

1. Majority of the respondents (33.3%) belong to the age group of 26–40 years, indicating that the working-age population is highly affected by post-COVID complications.
2. Fatigue (63.3%) is the most common long-term symptom, followed by breathing problems, anxiety, and joint pain.
3. About 70% of the respondents reported moderate to high impact on their work performance due to post-COVID health issues.
4. The Chi-square test shows a significant relationship between severity of COVID infection and long-term complications.
5. The incidence of complications is highest among severely affected patients (91%), followed by moderate (82%) and mild cases (58%).

Suggestions

1. Regular post-COVID medical check-ups should be arranged, especially for patients who had moderate and severe infection.
2. Awareness programs on long COVID and its management should be conducted in workplaces and educational institutions.
3. Employers should provide flexible work schedules and health support facilities for affected employees.
4. Psychological counselling services should be strengthened to address anxiety, depression, and stress among post-COVID patients.
5. Government and health authorities should develop rehabilitation programs focusing on physical fitness, mental health, and nutritional support.

Conclusion

The study concludes that people's physical and mental health are significantly and permanently impacted by post-COVID problems. The most prevalent symptoms that impair quality of life and productivity at work are exhaustion, respiratory issues, and mental stress. The degree of long-term health impacts is largely dependent on how severe the original COVID infection was. The results emphasize the necessity of supporting workplace practices, ongoing monitoring, and thorough post-COVID care. Effective medical care and education can lessen the long-term effects of COVID-19 and enhance the general health of those impacted.

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