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[ijrset@gmail.com](mailto:ijrset@gmail.com)

[www.ijrset.com](http://www.ijrset.com)

# Post Covid Physiological Challenges and its Impact on Human Behavior

**Dr. Anupama Johri**

Associate Professor, Dept. of Home Science, Govt. Girls College, Chomu, District Jaipur, Rajasthan, India

**ABSTRACT:** Although most people with COVID-19 get better within weeks of illness, some people experience post-COVID conditions. People commonly report experiencing different combinations of the following symptoms viz. Difficulty breathing or shortness of breath, Tiredness or fatigue, Symptoms that get worse after physical or mental activities, Difficulty thinking or concentrating (sometimes referred to as “brain fog”), Cough, Chest or stomach pain, Headache, Fast-beating or pounding heart (also known as heart palpitations), Joint or muscle pain, Pins-and-needles feeling, Diarrhea, Sleep problems, Fever, Dizziness on standing (lightheadedness), Rash, Mood changes, Change in smell or taste, Changes in period cycles. Patients, who got their report negative in May, are still going through post-Covid symptoms like elevated sugar level, lethargy, lung related issues and brain fog. “Post-acute COVID-19 syndrome” viz. post corona is further divided into two periods: (1) clinical and laboratory abnormalities that persist 4–12 weeks beyond acute COVID-19; and (2) clinical and laboratory abnormalities persisting 12 weeks beyond acute COVID-19 and not attributable to alternative diagnoses.

The biggest hospital for children in Rajasthan, JK Lone in Jaipur has recorded 17 deaths in the last two months among the 155 cases of Multisystem Inflammatory Syndrome in Children (MISC) while doctors across the state grapple with rising cases of this rare inflammatory syndrome- a post-Covid-19 complication.

In post COVID syndrome, direct viral toxicity; endothelial damage and microvascular injury; immune system dysregulation and stimulation of a hyperinflammatory state; hypercoagulability with resultant in situ thrombosis and macrothrombosis; and maladaptation of the angiotensin-converting enzyme 2 (ACE2) pathway. The best way to prevent these long-term complications is to prevent COVID-19 by getting a COVID-19 vaccine, Wearing a mask that covers your nose and mouth to help protect yourself and others, Staying 6 feet apart from others who don't live with you, Avoiding crowds and poorly ventilated indoor spaces, Washing your hands often with soap and water, Use hand sanitizer if soap and water aren't available. An explicit message of Post-COVID-19 is that other people/places can carry an invisible threat. Deciding on what to do—especially in relation to large decisions, such as holidays and where to live or work—is becoming a more anxious process. Many purchases are being postponed. All of this will make risk less tolerable and the familiar more valuable.

Children learn many of their own fears and anxieties from what they hear and what they see. In other words, seeing something scary on television, hearing something scary on the news, or seeing their parents look nervous or afraid are common learning mechanisms for young children.

## I. INTRODUCTION

Post-COVID symptoms are defined as new, returning, or ongoing health problems that people can experience 4 weeks or more after first being infected with the virus that causes COVID-19. In some cases, people who had no symptoms (or mild symptoms) when they were first infected with the virus can have post-COVID symptoms. Also, these symptoms may or may not be the same as the symptoms they experienced when they were first infected with COVID-19. Experts have noted a steep rise in the number of recovered Covid patients experiencing long-term heart problems such as “chest pain, sudden palpitation, heart attack, heart-swelling, heart failure, low pump capacity (low ejection fraction), and arrhythmia (abnormal heartbeat)”. To keep the heart healthy, post-covid patients must go for regular cardiac screening after every six months, stick to a healthy diet, stay physically active, and take medication. In fact, hair loss is one of the post-Covid conditions that people are facing. [1]

The post-COVID experience will include the return of symptoms — fever, fatigue and breathlessness — as well as more severe sequelae, including impairment of renal and cardiovascular function, ongoing hypercoagulability, myalgia, depression, and other persistent physical and psychological effects. Patients around the country have been reporting feeling lingering effects of COVID-19 post recovery for between 4-12 weeks, or even beyond this.



Pediatric Post COVID-19 Rehabilitation Clinic, for children and adolescents who have recovered from COVID-19 but need additional support to regain lost neurological and physical functioning as a result of the illness. After a prolonged illness, rehabilitation can play a critical role in recovery.

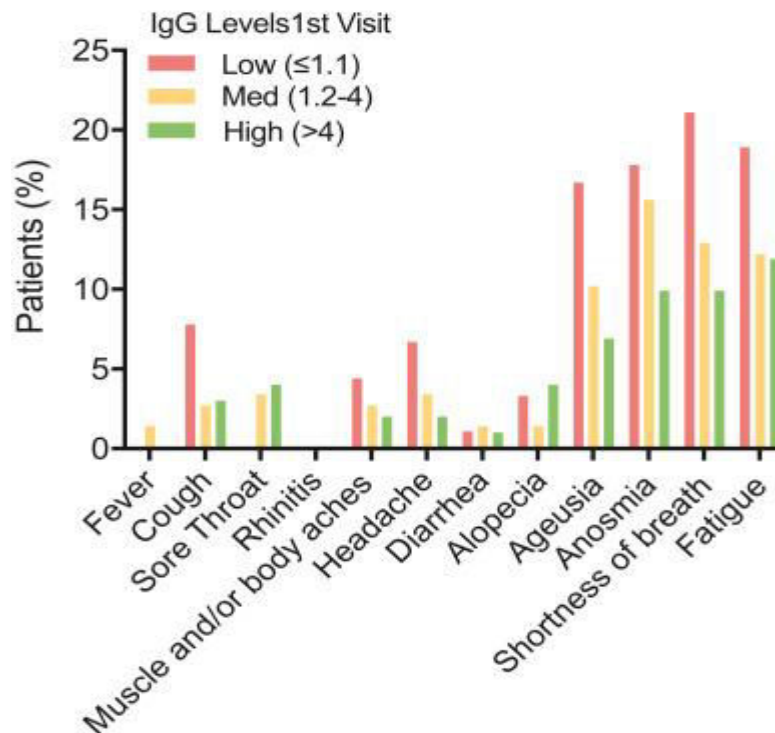
Almost all Covid patients suffer neurological disability in a varying scale. This is because Covid affects nerve cells due to which brain activity does slow a bit after a patient recovers from Covid. This is why majority of the patients show cognitive deficits after they recover from Covid infection[2]

Some of the most common Post COVID symptoms include the following problems experienced post-recovery:

- A persistent cough, a feeling of chest pain, and shortness of breath, chest heaviness.
- Increased fatigue coupled with brain fog that makes focusing, thinking clearly, and paying attention difficult.
- Anxiety, mood changes, and depression.
- Increased fatigue and a decrease in stamina a Post with severe muscle and joint pain, specifically in legs.
- Hair loss has been noted in some patients exhibiting Post COVID syndrome.
- Difficulty sleeping, concentrating and recalling events.
- Rashes and sudden hair loss are also symptoms of Post COVID syndrome.
- The feeling of your heart pounding or heart palpitations coupled with sweating indicates a decrease in proper pumping and functioning of the heart.
- Abnormal lung function and inflammation of the heart muscle.
- Gastrointestinal symptoms, extreme appetite, abdominal bloating, acid reflux.

Those who have anxiety or depression post-COVID may benefit from counselling. Breathing exercises, balanced diet and gradual introduction of physical activities may help in these patients. Specialist consultation will be required in a very small number of patients who continue to have persistent organ-specific symptoms. In patients recovering from COVID, tele-consultations or physical consultations with a local doctor are recommended for 3-6 months.

The enforced shift during the worst of the pandemic to virtual working, consuming and socializing will fuel a massive and further shift to virtual activity for anything. It will affect ways of communicating across learning, working, transacting and consuming. This cause impact to everyone.[3,4]



Graph showing Post covid symptoms in patients during a survey study  
Specific and general methods of physical rehabilitation can be helpful.





## II. OBSERVATIONS

Early complications of COVID-19 include:

- Acute respiratory distress syndrome (ARDS)
- Sepsis or septic shock
- Multi-organ failure
- Acute kidney injury
- Cardiac injury

These complications often lead to the person being admitted to an Intensive Care Unit (ICU).

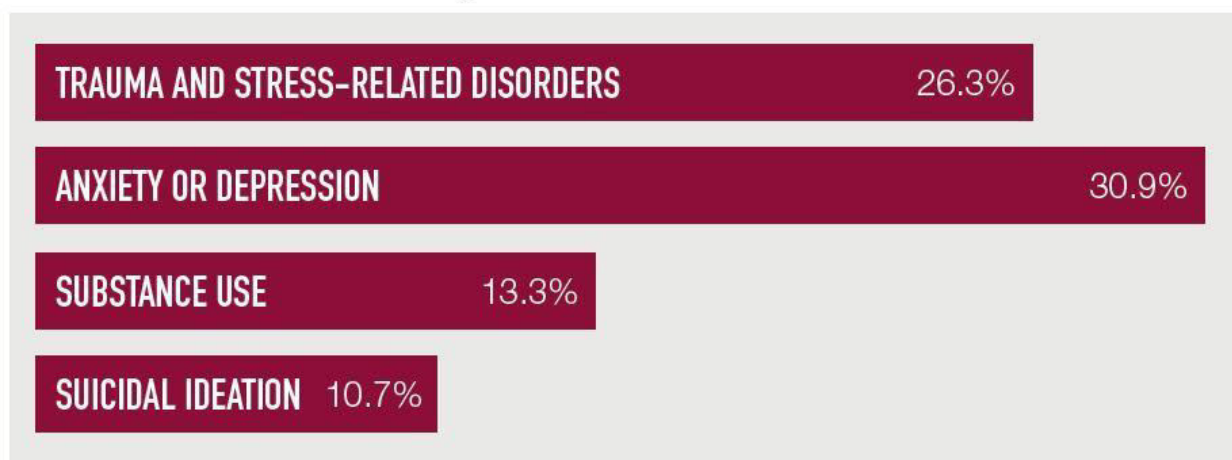
People are concluding that they cannot rely on existing health structures but, nonetheless, want all the help they can get, in every aspect of their lives. Health experiences will be in demand and, vice versa, health should be considered in every experience.[5]

Moolchand Hospital, a leading private facility in the national capital, has recorded a “troubling rise” in neurological issues, including emergency cases of brain haemorrhage, among post-COVID-19 patients. The Moolchand Hospital has been recording increasing cases of intracerebral (brain) haemorrhage, and 50 percent of the neuroscience department is filled with such cases. The most common neurological syndromes reported were acute encephalopathy (49 percent), coma (17 percent), and stroke (6 percent). These patients are being given the diagnosis Long COVID or Post-acute sequelae of COVID-19 (PASC). It is likely that individual patients with a PASC diagnosis have different underlying biological factors driving their symptoms, none of which are mutually exclusive.

There has been a rise in the number of people showcasing gastrointestinal symptoms, including diarrhoea, acid reflux, cramps, nausea during the second wave of the coronavirus. While these symptoms were not evidently seen before, some of the gastrointestinal implications have been linked to the changing, mutating nature of the virus.[6]

Human beings are inherently social, not solitary, creatures. When people’s actual or achieved social contact falls below their desired level of social contact, they begin to feel lonely, and loneliness is stressful. The stress of loneliness degrades mental and physical health (e.g., cardiovascular fitness, immune fitness) through disruption of recuperative behaviours (e.g., sleep, leisure) and corruption of health behaviours (e.g., substance use, diet, exercise).

**Table. CDC Survey on Mental Health, Substance Use, and Suicidal Ideation During the COVID-19 Pandemic<sup>10</sup>**



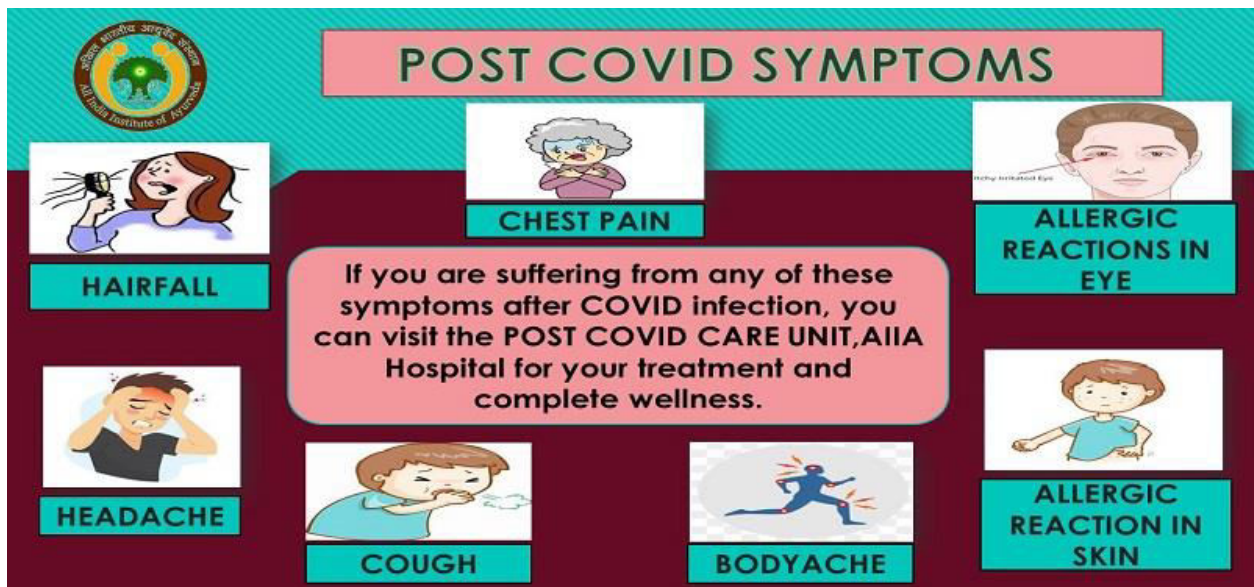
Mucormycosis is a fungal infection that is seen in an immunocompromised host. It presents itself as a respiratory or a skin infection and is mainly caused due to exposure to mucormycetes molds by breathing in the affected mold spores in air also referred to as a sinus (pulmonary) exposure. When the infection spreads to the brain through the nasal route it is called as rhino cerebral mucormycosis, when it spreads to the lungs it is called as pulmonary mucormycosis, on the skin it is called cutaneous mucormycosis and it when spreads through the bloodstream it is called disseminated mucormycosis. The predisposing factors for mucormycosis can be uncontrolled diabetes mellitus, immunosuppression

by steroids, prolonged ICU stay, Comorbidities – post transplant/malignancy, Voriconazole therapy. For a patient affected with mucormycosis it is advised to control hyperglycemia, monitor blood glucose level post COVID-19 discharge and also in diabetics, use steroids judiciously, use clean and sterile water for humidifiers during oxygen therapy, and antibiotics/antifungals must be taken judiciously.[7,8]

There will be a rise in home spending—on the home and made at home as people will stay more local. Desire for cocooning, along with opportunities for those with creative strategies to enable it, will move center-stage. Winners will be those who zero their sights on the home.

### III. DISCUSSION

In 2019, there was a 15.7% increase in the number of HA filler treatments performed, resulting in over 4 million treatments worldwide compared with the preceding year. HA filler is found natively in the mammalian tissue and is often considered to not interact or initiate a response when introduced to biological tissue. “Type 1 hypersensitivity reactions are immunoglobulin E (IgE)-mediated, occur rapidly within minutes or hours, and can result in anaphylaxis or angioedema,” according to the case study authors. “Delayed-type hypersensitivity to HA filler are rare reactions, occurring anywhere between 24 hours to weeks or months after placement. Presenting as a firm erythematous swelling that is often tender to touch, they are caused by a T-lymphocyte mediated response.” All patients who receive HA filler have a risk of hypersensitivity and most will encounter flu-like illnesses at some point. This risk may currently be higher as COVID-19 infection rates increase.



The Your COVID Recovery is one element of the five-part package of measures to boost NHS support for Long COVID patients. It offers a digital, interactive and tailored recovery and rehabilitation programme that has been developed by experts to provide rehabilitation support for post-COVID patients to manage their recovery at home. The Your COVID Recovery online rehabilitation programme is available for systems to register as a service and access the training required to refer patients into the programme.[9]

A reinvention of authority is likely after the effect of travel limitations, self-isolation and lockdown officially mandated by many governments. Greater acceptance for the role of government and companies in society, and the importance of collective behavior, may occur.[10]

### IV. CONCLUSION

Rehabilitation is defined as "a set of interventions designed to reduce disability and optimize functioning in individuals with health conditions in interaction with their environment."

1. Physiotherapists are instrumental in the rehabilitation of patients as they transition from the acute phase to the post-acute phase.

2. The consequences of COVID-19 will be specific in each individual and their rehabilitation needs will be specific to these consequences such as:
  - Long term ventilation
  - Immobilisation
  - Deconditioning
  - Related impairments – respiratory, neurological, musculoskeletal
3. COVID-19 patients will often present with pre-existing comorbidities and this must be taken into consideration in the rehabilitation plan for the patient. Physiotherapists working across various disciplines should work together and draw on the expertise of each other. [11]

The transition from the acute to the post-acute phase needs to be supported through service delivery pathways and the multidisciplinary team will be key to this.



### Rehabilitation speeds recovery

The Active Cycle of Breathing Techniques (ACBT) is one way to help you to clear your sputum from your chest. ACBT is a set of breathing exercises that loosens and moves the sputum from your airways. It is best to be taught ACBT by a physiotherapist [12]

A new world is emerging, where man already is thinking in a globally perspective. Governments could realized the importance of a global health system that not only provide care for the need ones while expensive private systems divide the nation into rich and poor. During pandemic, the world could witness that either private and public system could not afford to deal with so many patients, in which, made people realize there is no difference between rich and poor when it comes to a global disaster.

Either, during the devastating isolation caused by Covid 19, world leader could better understand the importance of the wealth distribution. A giant number of unemployed had to ask governmental financial support, which



combined with others isolation disturbance is crashing the global economy. Thus, during the pandemic the world could watch acts of empathy, compassion, gratitude, kindness, cooperation, and an entire nation moved and determined to end racism and violence against minorities, such as, violence against women, the LGBT community, religions, and many others. [13]

By facing one of the most challenging time on humanity, the mankind is changing its behavior to create a new society. The neuroscience, which is the science that study the human brain and their behavior, plays an important role during this difficult historic moment, in order to understand the human attitudes to guide to a better civilization. Either, neuroeconomy and neuroplitics will also be an important tool to build the future society.[14] The Covid-19 storm will pass and mankind will survive, despite the loss of many lives. Humankind will soon live in a world that is very different from the one before the virus. However, the pandemic will succeed where the other movements of the 20th century have failed in their struggle to establish democracy and human rights, and preserve a safe environment for all.[15]

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