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Overcoming the after effect of coronavirus

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Although we do not have much data as many researches are still underway, one thing common in all of researches is the “long lasting impact on the lungs.” Even for the people who were not hospitalized, the respiratory issue still remains a point of concern.

Researchers have theorized that the virus responsible for COVID-19 is very similar to earlier viruses like SARS and MERS which caused severe acute respiratory distress syndrome (ARDS) which lasted for a very long time causing irreversible damage to the lungs and quality of life of individuals being affected by it.

Therefore it is necessary to address this problem by finding suitable rehabilitation techniques for the lungs. The main goal in respiratory physiotherapy is to mobilize secretions and ease the work of breathing while working on increasing the inspiratory and expiratory capacities. Interventions may include techniques such as autogenic drainage, positioning, breath stacking, deep breathing exercises, active cycle of breathing, mobilization and manual techniques (e.g., percussion, vibrations, and assisted cough) to aid sputum clearance and increase the lung efficiency. These interventions can be performed at any stage of the disease as they are appropriate and safe to perform.

Patients recovering from an acute COVID-19 event may present with a disability or functional damage (CIM, respiratory function, PICS, CIP), decreased participation and deterioration in their quality of life (short-term as well as long-term postdischarge). Variable recovery time – depending
on the degree of normocapnic respiratory failure, emotional dysfunction, associated physical dysfunction (asthenia, muscle weakness); the presence of other co morbidities. Clinical parameter evaluating protocols are also indicated on a daily basis even after testing negative – temperature, SaO2, respiratory rate, dyspnea, thoracoabdominal dynamics, and cough.

Techniques such as diaphragmatic breathing, pursed-lip breathing, incentive spirometry, lung expansion techniques (positive expiratory pressure) bronchial hygiene, manual mobilization of the ribcage, aerobic exercise, respiratory muscle training, and are useful in rehabilitating the lungs. In the event of comorbidities like secondary pneumonia, bronchiectasis, or increasing secretions, postural drainage, and standing may help with secretion management.

The aim of pulmonary rehabilitation is to not only improve the patient’s physical and mental conditions but also to aid the patient return to family and society more promptly. In addition, because COVID-19 has caused a public emergency, patients with COVID-19 may demonstrate different degrees of psychological disorders, such as depression anxiety insomnia anger, fear and loneliness, as well as a lack of cooperation and abandonment of treatment due to fear of the disease. Patients are experiencing post-traumatic stress syndrome also. Therefore, prompt introduction and continuous availability of pulmonary rehabilitation services is critical for patients with COVID-19. So it is important to ensure we address the after effects of COVID-19.

- How it started all
- Impact of COVID-19 and physical inactivity on the immune system
- The lungs- after COVID
- How to increase lung efficiency with various methods
- Diaphragmatic breathing/deep breathing
- Chest/lung physiotherapy
- Fighting COVID-19 with proper nutrition
- Quality of life/mental health
- Long-term effects of lung rehabilitation.

### 13.1 How it started all/a quick recap

Severe acute respiratory syndrome coronavirus (SARS-CoV)-2, a novel coronavirus RNA in the same family as SARS-CoV and Middle East respiratory syndrome coronavirus (MERS-CoV), was identified at the beginning of January 2020 as the cause of a pneumonia epidemic affecting the city of Wuhan, the capital of Hubei province, from where it spreads rapidly across China [24]. After infecting and killing thousands of people in China, the virus has spread to Italy and other European countries and the USA, with the number of confirmed new cases increasing every day.
The World Health Organization named coronavirus disease in 2019 (COVID-19) and subsequently declared it a pandemic due to widespread infectivity and high contagion rates. Human coronaviruses usually cause respiratory and enteric infections [1].

Although serious lung injury has been reported at all ages, in some high-risk individuals, such as the elderly or those affected by multimorbidity, the virus is more likely to cause severe interstitial pneumonia, acute respiratory distress syndrome (ARDS) and subsequent multiorgan failure, which are responsible for severe acute respiratory failure and high death rates. Typically, affected individuals display a variable degree of dyspnea and radiological signs.

13.1.1 Impact of COVID-19 on the immune system and physical inactivity

COVID-19 characterized by major symptoms of fever, dry cough, myalgia, and fatigue. Currently, neither vaccines nor clinically proven effective treatments are available. Convalescent plasma and antiviral drugs have shown some promise in the treatment of COVID-19 patients, but their widespread use is awaiting statistical rigor. Behavioral strategies for social distancing and hygiene are currently the best and only means of limiting spread and reducing morbidity and mortality [2]. As this strain of the virus is novel to the human immune system, we depend on aspects of our innate immunity to deal with the initial infection.

Like most viral infections, if we survive the infection, we develop virus-specific antibody and cell-mediated immune responses over weeks. In most cases, this exposure-related ‘training’ of our immune systems provides long-lasting protection against re-infection or, if we are re-infected, the symptoms of disease are much milder. However, we do not currently know whether our response to-CoV-2 is sufficient to be protective and long-lasting. Along with tests for the presence of viral particles and plasma antibodies, there is a clear need for research related to vaccine development and research to determine whether our immune response is adequate to protect us. Public health recommendations (i.e. residence orders, park closures, gymnasiums and fitness centers) to prevent SARS-CoV-2 from spreading have the potential to reduce daily physical activity (PA).

These recommendations are unfortunate because day-to-day exercise can help combat the disease by boosting our immune systems and counteracting some of the co-morbidities such as obesity, diabetes, hypertension, and serious heart conditions that make us more susceptible to serious COVID-19 disease [1].

Studies have clarified some understanding of the mechanisms responsible for these observations. Early epidemiological studies suggested that intense, prolonged exercise was associated with an increase in upper
respiratory tract infections. This led to the concept of inverted J theory, where moderate exercise reduces and prolonged, high-intensity exercise increases the susceptibility to infection [3]. Since then, many studies have supported the theory of individual immune parameters, including those specific to viral defense. For example, salivary lactoferrin and its rate of secretion increased for up to 2 hours after moderate exercise. Mucosal lactoferrin is important because it can prevent DNA and RNA virus from forming infecting cells by binding and blocking host receptors.

Conversely, low levels or secretions of salivary immunoglobulin A, which can bind to and inactivate viruses, have been shown to be associated with upper respiratory tract infection in some athletes under intense training. Moreover, because PA and exercise result in profound movement of leukocytes in blood and tissues, many researchers predict that physical activity increases [1].

13.1.2 The lungs after the COVID

Coronavirus 2019 (COVID-19), more recently known as SARS-COV-2, is a coronavirus that belongs to the b-corona cluster and is largely spread via droplets. When an infection occurs, the virus enters the lungs and is received by angiotensin-converting enzyme 2 (ACE2), which is expressed in normal humans in alveolar cells of type I and type II. When the virus binds to ACE2, it damages the alveolar cells. Under normal circumstances, alveolar cells act to synthesize and secrete surfactants, perform xenobiotic metabolism, aid in the transepithelial movement of water, and regenerate alveolar epithelium after lung injury. These functions help with normal lung functions. As a result, damage to alveolar cells may result in respiratory problems, other systemic manifestations, and eventually death. As a result, the clinical manifestations of COVID-19 disease include fever, cough, myalgia or fatigue, pneumonia, and complicated dyspnea.

Many people exposed to the SARS-CoV-2 virus have no symptoms or are relatively mild [25]. Some patients, on the other hand, experience catastrophic lung damage characterized by rapid-onset fibrosis. Pulmonary fibrosis involves thickening the small airways and surrounding tissues [4]. It can develop as a result of COVID-19 and a variety of other conditions. Specifically, milder symptoms of COVID-19 appear to occur more commonly in younger ages—probably because lower age poses a comparatively lower risk of “cytokine storm” causing the most extensive fibrosis seen in COVID-19 patients. Yet, even among the many older patients, many survive the initial disease [26]. And among younger patients, many survivors may still have persistent pulmonary fibrosis and other respiratory complications from SARS-CoV-2 [5].
Severe respiratory complications appear to occur in about 20 percent of people who have been tested positive for SARS-CoV-2 for polymerase chain reaction tests of throat swabs and blood samples [36]. Severe disease has been defined according to six criteria:

(a) Rapid deterioration of the patient’s condition  
(b) Lower levels of white blood cells that fight infection  
(c) Extreme inflammation throughout the body  
(d) Damage to components of the immune system such as spleen and lymph nodes  
(e) Lesions in the lungs with particular pathology  
(f) Clotting and blood damage.

Studies suggest that clotting and inflammation components play a key role in causing extensive, permanent lung damage. However, only about 3% of total people tested positive for SARS-CoV-2 are killed by COVID-19. As a result, approximately 17 percent of the total SARS-CoV-2 patients develop severe clinical symptoms but survive the initial infection. Among older survivors of COVID-19, the proportion of patients affected by extensive fibrosis is likely to be higher than the 17% estimate for the total population tested positive for SARS-CoV-2.

13.2 How to increase lung efficiency with different methods

- Diaphragm breathing/deep breathing  
- Physiotherapy of the chest/lung  
- Fight against COVID-19 with proper nutrition  
- Diaphragm breathing/deep breathing

While the clinical course of the COVID-19 pandemic continues, researched, many patients with COVID-19 develop respiratory failure and require mechanical ventilation (MV) to maintain adequate pulmonary function. The exchange of gas in this regard, a recent report shows that ~54% of patients are hospitalized due to COVID-19 respiratory failure and >30% require MV. Although MV is often a life-saving intervention, the unwelcome consequence of prolonged MV is the rapid development of Respiratory muscle weakness due to atrophy of the muscle diaphragm and contractile dysfunction (collectively referred to as ventilator-induced diaphragm Dysfunction) VIDD.

VIDD is clinically significant because of diaphragmatic Weakness is a major contributor to weaning inability Patients with the ventilator. Many patients with COVID-19 often require ventilation. Prolonged time on the ventilator to increase the risk of weaning Issues. Patients with difficult weaning experience suffer higher morbidity and mortality as patients
weaned quickly in their first attempts to separate from the ventilator and unfortunately too many COVID-19 patients succumb to ICU-related complications (e.g., sepsis).

Because respiratory muscle weakness is the primary risk factor for failure Developing strategies to protect the diaphragm from the ventilator [6].

In critical cases MV-induced weakness has become a priority Medicinal care. Interestingly, studies on the effects of endurance exercise Training on the respiratory system has led the way. Although many organ systems are adapted in response to endurance exercise Training, the structural and functional properties of the lungs and Airways are not affected by training exercises. However, while airways are not affected by training [7]. The gas-exchange side of the respiratory system is not adapted for exercise training the “pump” side of the respiratory system undergoes adaptive training. Changes in response to the exercise of endurance. Specifically, stamina Exercise training promotes a number of biochemical alterations in diaphragm muscle resulting in a phenotype that is protected against a few.

Challenges including prolonged MV. Indeed, as few as ten consecutive MV. Days of endurance training results in significant protection Against VIDD. As a result, endurance trained individuals are expected to be trained. Developing COVID-19 and requiring support for the ventilator benefit from the exercise-induced conditioning of the diaphragm. In addition, when respiratory symptoms are severe, Can progress to respiratory failure (acute respiratory distress) Syndrome), which could lead to death if it is not managed, prompt use of invasive ventilation [7]. For those, however, With mild to moderate symptoms, non-invasive techniques such as It can be used as a chest physiotherapy.

13.2.1 Physiotherapy of the chest/lung

Physiotherapy plays a vital role in the management of patients who have been infected with COVID or recovered. It plays a pivotal role in the management of acute and chronic respiratory conditions that help to improve the quality of life following acute illness [8].

It will also be important to explore the value and impact of physiotherapy in patients aged with chronic lung fibrosis caused by COVID-19. Physiotherapy with and without devices is often extremely beneficial for people with pulmonary fibrosis [9]. In a variety of different fibrosis-causing conditions, patients can maintain optimal respiratory health by actively clearing mucus from small airways [7].

Percussion therapy is a common component of keeping your fibrotic lungs healthy throughout your life. This can be achieved by manual clapping on the chest and back and/or by means of assistive devices such as oscillating vests and hand-held percussors.
Respiratory muscle training is a different approach. This can be done manually through an active cycle of breathing exercise and/or through the use of assistive devices such as flutter pipes and inspiration/expiratory trainers [10]. In older patients, it will be particularly important to consider the relative value of each type of therapy given the safety concerns associated with percussive pressure in people with lower bone density and/or more fragile skin.

Physiotherapy has been shown to be necessary for the physical rehabilitation of post-COVID-19 patients. These patients have variable symptoms, including either dry or productive cough. Those with dry cough may not benefit from physiotherapy, but patients with productive cough and underlying respiratory conditions or other comorbidities associated with hypersecretion and ineffective cough (e.g. neuromuscular disease, respiratory disease, obesity, etc.) may benefit from the same. Many COVID-19 patients also presented a stroke that increased their morbidity. There is sufficient evidence to suggest the development of ICU-acquired weakness in patients admitted to ICU for a prolonged period of time.

Patient education and training will be critical across the spectrum of clinical interventions for healthy aging with COVID-19 lung fibrosis [27]. These supports should include attention to both biomedical and psychosocial aspects of living with advanced lung damage. Because patients of all ages will be very new to managing the condition if it has been caused by SARS-CoV-2 infection, they may have unique needs on this front. These needs and associated patient preferences may vary slightly depending on age as well as other social locations and experiences [27]. Newer patients with lung fibrosis may need time to determine their needs and preferences in these areas. More experienced patients whose pulmonary fibrosis originated with other conditions can therefore provide valuable support in developing both best clinical practices and responsive community resources for aging and older adults with long-term respiratory impacts from COVID-19.

Chest physiotherapy has been used in many different respiratory states [11]. It has been said to improve the exchange of gas, to reverse Pathological progression, reducing or avoiding the need for Artificial ventilation when provided very early [11]. However, there is still a lack of evidence for COVID-19 patients In addition to its effects, especially during the acute stage, aside from Some position papers or anecdotal recommendations Evidence of this. This is because of the characteristics of the respiratory system the problems in COVID-19 patients differ significantly from in other respiratory conditions [12].

For example, patients with COVID-19 do not usually have exudation during the acute stage. In addition, dyspnea in COVID patients-19 may progress rapidly towards acute respiratory failure. As a result, the timely use of mechanical ventilation in these areas Situations are strongly recommended [13].
COVID-19 is highly infectious and spreads rapidly. Concerns have been raised about the use of chest physiotherapy in Infectious diseases. This is because it was argued that Physiotherapy in the chest may cause aerosolization. This could be Increase the rate at which COVID-19 spreads out. Later, however, the findings in similar circumstances refuted this view [14].

According to that- evaluation of the dispersion of droplets Influenza pandemic and other airborne infections have shown Physiotherapy in the chest significantly and predominantly produced Droplets $>10\mu m$ [28]. Droplets of this size are not breathable, only droplets within an inspirable range (about $5 \mu m$) can play an important role in the transmission of infections [29].

Similarly, a review of the transmission of aerosol from influenza A virus disputes whether it is even possible for the droplets to come from Chest physiotherapy for transmitting infections. Moreover, A disease that shared similar pathophysiology with SARS COVID-19, thoracic physiotherapy was later recommended.

In addition, the overall management of COVID-19 is still symptomatic, as scientists are still trying to do, Understanding its pathophysiology and viral behavior. As a result, the disease can kill in days to days, especially in the elderly and those with disabilities, weak immunity, we can cause our patients to sneeze or cough out the sputum in disposable plastic bags, and after thoracic physiotherapy to prevent or reduce thoracic disease the chance for aerosolization. Chest physiotherapy may improve respiratory function and quality of life in COVID-19 patients, especially after Release [15].

There is still a lack of evidence during the acute stage Its usefulness, apart from some professional recommendations, On the basis of anecdotal evidence. It should be noted, however, Physiotherapy for the chest is an individualized treatment Particular presentations of the patient. When, therefore, Patients with symptoms that may benefit from the chest physiotherapy may be given while the patients are in close proximity observed for any adverse event [16]. In addition, when administered physiotherapy of the chest for patients in the acute stage, measures of this kind Use of surgical masks, if available, should be taken as appropriate prevent cross-infection.

### 13.2.2 Fighting COVID 19 with proper nutrition

Nutrition is an important factor in human health, including maintains a strong immune system. However, up-to-date research indicates that no single nutrient or dietary supplement can prevent or treat COVID-19 patient. On the contrary, inadequate intake, in particular overdoses Dietary supplements may be more harmful than beneficial. Clinical
information demonstrate that patients dying from COVID-19 are mostly elderly people [30]. Complication of other diseases and malnutrition problems ageing development of COVID-19 from mild to severe symptoms, it is closely related to nutritional status [17]. Therefore, the assessment of nutritional status is considered. The status is necessary and important during infection with COVID-19 [17].

Patients with COVID-19 have increased proinflammatory activity Cytokines, high sensitivity C-reactive protein (hsCRP) and increased Risk to sepsis and ARDS; experiences in the treatment of SARS, MERS, and ARDS. Other infectious diseases of the virus and clinical trials in patients with COVID-19 show the beneficial effects of nutritional support on COVID-19. By reducing oxidative stress and increasing immunity, nutritional support helps people to reduce the risk of infection by the virus or to reduce the symptoms of COVID-19 [4].

In patients with COVID, plasma, hsCRP, a marker of inflammation and oxidative stress is significantly increased. As a result, antioxidant status increases and proinflammatory cytokine release decreases [31].

Fruit and vegetable intakes have been investigated for potential benefits in combination with respiratory and inflammatory conditions due to their nutrient profile consisting of antioxidants, vitamins, minerals and phytochemicals, including phenolic compounds that may have antioxidant, anti-inflammatory, and other beneficial effects.

Vitamin C (ascorbic acid) is a water-soluble vitamin that has been used as part of cultural practice in cold or flu for decades. This is due to research published by Nobel Prize winner Linus Pauling (circa 1970) on how vitamin C helps treat colds.

However, regular vitamin C supplements had a number of benefits, including:

- Reduced cold severity: Reduced symptoms of the cold, making it less severe.
- Reduced cold duration: Supplements reduced recovery time by 8% in adults and 14% in children on average [18].

Regular treatments are likely to be an effective strategy for lowering ARDS. And the risk of COVID-19. Vitamin C is a commonly used scavenger antioxidant. ROS and to protect cells against oxidative stress. Intravenous (i.e.) or oral administration of high doses of vitamin C has been reported to be safe. Protects against viral infection without major adverse events [19]. In addition, high-dose vitamin-C supplementation with i.v. Administration of the Intensive Care Unit (ICU) stay shortened by 7.8% and significantly decreased mortality rate.

The findings on vitamin D and immune function are also erroneous. Vitamin D is often referred to as sunshine vitamin; it is also found in eggs,
mushrooms, fatty fish such as salmon, milk and dairy products, or vitamin D fortified foods [31].

Vitamin D itself may have antiviral effects by inhibiting viral replication and by its immunomodulatory and anti-inflammatory properties. It is assumed that increased vitamin D may benefit from SARS-CoV-2 infection. Higher doses of vitamin D are certainly recommended for vulnerable individuals. It is also particularly important to increase dietary sources of vitamin D at this time, as many people worldwide are exposed to less sunlight due to ‘stay at home’ mitigation strategies.

Vitamin E is a group of fat-soluble antioxidants that contains molecules such as tocopherols and tocotrienols [38].

Nuts, seeds and vegetable oils are important contributors to dietary intakes, as are green leafy vegetables and fortified cereals. Numerous studies have shown that vitamin E deficiency affects both humoral and cell-mediated immune functions. Vitamin E is generally accepted to exert its immune-enhancing effects by scavenging oxygen species to reduce oxidative stress and to induce anti-inflammatory effects. [37] Vitamin E may also protect polyunsaturated fatty acids (PUFAs) in cell membranes from oxidation, regulate the production of ROS and reactive nitrogen species (RNS) and modulate signal transduction.

Vitamin E is also present at high concentrations in immune cells, which protects them from oxidative damage due to their high metabolic activity and PUFA content [38]. In particular, aging is associated with immune system deregulation, predisposing people to increased oxidative stress and inflammation. This leads to an increase in the incidence of elderly infections, such as influenza. Although elderly people have comparable vitamin E levels to younger people, increasing vitamin E intakes may benefit their immune function, provide resistance to infection, and reduce morbidity due to infections [31]. As elderly people are predisposed to infection due to immune sensitivity, it is worth investigating the potential benefits of vitamin E against COVID-19. In fact, it has been suggested that a combination of vitamins C and E may be a useful antioxidant therapy for cardiac complications of COVID-19.

Zinc is a trace element of the diet that is critical to the development of immune cells and an important cofactor of many enzymes. Zinc deficiency may contribute to defective cell-mediated immunity and increased susceptibility to various infections, including pneumonia. Despite various zinc-containing foods, including meat, dairy and legumes, etc., the majority of zinc-containing dietary research focused on zinc supplementation. It is therefore not clear from high zinc dietary studies that increased zinc intake can protect against viral infections [20]. In fact, zinc supplements and lozenges are a popular remedy for the fight against colds and respiratory diseases.
Finally following any healthy diet at this time that provides adequate RNI wills support immune function. However, there is concern that people who are deficient in certain micronutrients, such as vitamin C, vitamin D or zinc, may warrant supplementation or change their dietary patterns in order to maintain nutritional status and promote healthy immune function [20]. This is especially important for our vulnerable populations, including the elderly. [38] Indeed, as many countries have established guidelines for people to “stay in place” and to limit travel, etc., it is important for everyone to consider vitamin D levels when exposure to sunlight is limited at this time. Similarly, although not always possible depending on the individual’s personal circumstances, maintaining activity or moderate exercise at this time may be beneficial in the promotion of immune health [20]. Exercise in any form, even at home, will help to maintain one’s health, as lack of exercise could significantly affect the cardiovascular risk of a person in the future. However, exercise may not be advisable in symptomatic patients with COVID-19, not only to reduce the transmission of the virus, but also because some infections with COVID-19 exhibit rare cardiac complications that could be aggravated by physical exercise.

13.3 Mental health and life quality

The feelings involved, such as fear and rage, must be understood and studied in order to recognize the psychological and clinical consequences of a pandemic. Fear is a system of animal safety adaptive which is crucial to survival in order to take account of future threats by many biological processes. But when it is chronic or disproportionate, it can be dangerous and can be a contributing factor in the development of various psychological disorders [16]. In a pandemic, uncertainty raises the anxiety and stress level of healthy individuals.

In the course of epidemics, the number of people with affected mental health appears to be greater than in the number of people affected by infection. Previous tragedies have demonstrated that the effects of mental health will last longer and have a higher incidence than the disease itself. [21].

Studies have found that patients who are or are suspected to be infected with COVID-19 can experience extreme reactions from emotions and behaviors, such as terror, boisterous, lone-life, anxiety, insomnia, or angeriness, as have been recorded in the past, in similar situations [22].

Psychological first aid is an integral component of the services given for populations that have been affected by crises and disasters, but the
most effective psychosocial support practices cannot be directed by uniform procedures or guidelines. Although reports on local mental health interventions have been released, more detailed emergency guidelines are unknown.

Psychosocial tests, including the monitoring of questions concerning Covid-19-related stressors (for example, proximity to infected sources, infected relatives, lost loved ones and physical distance), secondary adverse factors (economic loss), psychosocial consequences (for example, depression, anxiety, psychosomatic problems, insomnia, increased use of substances), Covid-19-related stressors (such as preexisting physical or psychological conditions). Some patients may require referencing for formal assessment and treatment of mental wellbeing, and others may benefit from supporting programs to encourage well-being and improve treatment (such as psychoeducation or cognitive behavioral techniques). In the broader economic crisis, suicidal thoughts may arise and require urgent consultation with a specialist for mental wellbeing or referral to potential emergency psychiatrical hospitalization, as this pandemic is widespread.

The major stressors that inevitably lead towards widespread pollutants include unclear prognoses, extreme shortages of testing and treatment services and protecting health workers and providers against infection, the imposition of unfamiliar interventions in public health which are contrasting with personal freedoms, high, growing financial losses, and messages from authorities.

Public health emergencies can impact both individuals’ health, safety and well-being (e.g., vulnerability, uncertainty, email isolation and stigma) (owing to economic loss, work and school closures, inadequate resources for medical response, and deficient distribution of necessities). Such effects can lead to various emotional responses (such as distress or mental illness), unsanitary behaviors in persons who are suffering from the disease and in the general public (such as inappropriate use of substances and non-compliance with public health guidelines such as in-house confines and vaccination).

Most people become resilient and do not succumb to psychopathology following disasters. Some people are actually seeking different strengths. Nevertheless, post-traumatic stress disorder (PTSD), [32] which is caused by exposure to trauma, is a priority issue in “conventional” natural disasters, technological events and deliberate acts of mass destruction [33]. The existing requirements for trauma needed for the diagnosis of PTSD cannot be met by natural circumstances such as life-threatening viral infections, but other psychopathology, such as depressive and anxiety disorders can also follow.

The WHO also shared concern about the emotional and psycho-social effects of the pandemic [34]. It speculates that new interventions, including self-isolation and quarantine, have changed people’s usual lives and
routines, which could lead to a rise in loneliness, anxiety, depression, insomnia, unhealthy alcohol and drug use, and self-harm or suicide [34].

Interestingly, in this social media era, the coronavirus pandemic is often characterized by rumors and disinformation not authentic and confirmed. With a sudden and almost continuous stream of news coverage about an outbreak, these rumors and unauthenticated details generate panic, anxiety and stress. Many people in India have been placed at risk by optimistic individuals or by those traveled abroad. However, because of social stigma and social isolation, they are not being evaluated [21]. They are frightened and worried that their family members will be blamed, isolated and taken away. It is crucial that psychologists and other practitioners warn these people not to do anything wrong, and this is a protocol to minimize and monitor the pandemic. In such a distressing situation, their fears must be explained and they should be helped, consulted, sympathized, and kind.

In order to alleviate these issues, the WHO has given a 31 point guidance. The recommendations provide guidance on the safety of the mental health of people of various ages impacted by COVID-19 who focus on children, women and service providers and recommend interventions to reduce anxiety, stigma and depression. Online tools are available to help control and deal with the stress resulting from the pandemic. It is critical that you, your family and friends take care of yourself. It improves the group to help others deal with their stress. Nevertheless, it is the shortage of mental health providers, practicers, psychologists, and healthcare services that poses the greatest obstacle in mitigating the mental health effects of the COVID 19 pandemic [21]. For a country like India this will be a challenge, where only 0.29 psychiatrists, 0.07 psychologists and 0.36 other paying psychiatrists for 100,000 people are available [39]. In such a scenario, a simple therapy kit that donors can deliver at home or in the hospital is valuable to create. The kit should include a variety of dimensions such as empathy and assistance for all affected individuals, with compassion and kindness you have to be understood. Development of online mental wellbeing and advice programs in hospitals, community health centers and psychiatric departments may be an opportunity to tackle this problem.

13.3.1 Long-term effects of lung rehabilitation

Rehabilitation after critical illness is a key component of the continuum of care [23]. The recovery is a dynamic procedure that refers to a longitudinal mechanism that seeks to mitigate the debilitating impact of a person’s impairments, to promote and optimize the functionality of everyday activities, and to enhance prospects for significant involvement in community on the basis of some new functional basis.
13.3.2 Lung rehabilitation of COVID-19 patients

Rehabilitation specialists in China developed realistic and feasible recommendations for respiratory rehabilitation for COVID-19 patients based on the consensus and references given by front-line experts. The short-term aim of lung rehabilitation is to alleviate dyspnea and to relieve anxiety and depression, while the long-term objective is to optimize the patient’s function, to enhance their quality of life and to allow them to return to society [35].

Thorough examinations should be carried out before the recovery program is started [19]. Medical and practice risk evaluations should also, for example, be carried out on the basis of clinical signs, vital signs, auxiliary tests, imaging, co-morbidities, contraindications, etc. for the patient, and psychological and nutritional assessments in the form of questionnaires should include the use of a quality of life, physical activity endurance, and other factors [21]. The outcomes of these measures can then be combined with the individualized and progressive recovery criteria for patients’ aerobic endurance, muscle power, balance and flexibility.

The substance of the prescription is mainly:

A. Aerobic exercises: walk, quick walk, jogging, swimming from low intensity, incremental intensity and length increase. Every time 3–5 days a week, 20–30 minutes.

B. Power training: incremental strength training is advisable. Every target muscle group has a training load of 8–12 RM, 1–3 group/time. Each community has an exercise period of 2 minutes, 2–3 days a week, and the exercise charge is increased every week by 5–10%.

C. Balance preparation: balance training should provide equilibrium training in patients with balance problems like unarm equilibrium and equilibrium training.

D. Respiratory training: if the patient has symptoms including breath loss, wheezing, and waiting problems after release, respiratory mode exercise should be planned in tandem with the assessment results, for example body posture handling, breathing rhythm modification, breathing muscle breathing exercise, and the expectoration exercise.

Under the principle of protection all recovery should be done. If the peripheral capillary oxygen saturation (SpO2) displayed in <88%, the patient should quit the rehabilitation scheme immediately, or if signs are present such as palpitations, sweat, tightness of the head and shortness of the breath that the clinician finds unsuitable for rehabilitation.

Therapy should be initiated as soon as possible in mild and moderate situations. In comparison, life-saving measures should be given priority in serious and vital situations where the state of the patient is unstable or the disease persists. In these cases pulmonary therapy can only be done
if the condition of the patient is stabilized. Furthermore, the movement of chronically or critically ill patients should be reduced to their bed or bed in view of their protection and human resources. When discharged, individualized care can proceed under the assumption of enhanced safety and prevention against other infectious diseases, such as cold.

The disease’s infectiveness is the most defining feature for rehabilitation of COVID-19 patients as compared with general rehabilitation of patients with chronic disease. Operations, such as instructed cough, expiration training and tracheal compression, that may increase the risk of infection should also be reduced. In order to protect the mouth from infection, a sealed plastic bag should be used during sputum. Furthermore, Lung rehabilitation of COVID-19 patients is primarily conducted through instructional recordings, brochures, remote visits or online training in order to safeguard protective equipment and prevent cross-infection. The entire Lung rehabilitation program shall be assessed and tracked.

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Non-Print Items

Abstract
Testing negative after testing COVID positive is only half the battle won. The tougher part is getting over the traces of the disease which is said to affect the quality of life as well as the lung functioning in the longer run. As the pandemic is unfolding issues like, lung fibrosis, lung functioning abnormalities, joint pain, fatigue, depression, anxiety, etc. are haunting even to the healthiest individuals.

Keywords
Wheelchair; Spinal cord injury; WST 4.1; SCIM