

Role of Physical Therapy in COVID-19 Pandemic

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ABSTRACT

Coronavirus disease 2019 (COVID-19), a pandemic, is an infectious condition caused by severe acute respiratory syndrome coronavirus 2 (SARS-COV-2), which has caused an increased number of hospitalizations worldwide. People infected with COVID-19 experience a variation in symptoms including cough, fever, muscle pain, fatigue, tiredness, and shortness of breath. Approximately 14% of patients experience a severe form of COVID-19 and thus requiring hospitalization, and 5% of patients require admission to an ICU. Effective screening of infected patients is necessary for early detection and the proper treatment and care of the patient. Polymerase Chain Reaction (PCR) and antigen-antibody tests are the screening methods for virus detection. The sample is taken either from the nasopharynx or the throat. Since the vaccine for the treatment of coronavirus is under production, supportive management is recommended for minimizing symptoms. Social distancing, hand hygiene, and wearing face masks are the preventive measures against this virus. Rehabilitative and physical therapy interventions have a significant impact on patients in resolving problems associated with breathing and for active mobilization to improve quality of life. This literature review sought to determine the effects of COVID-19 and to discuss what is known regarding the role of Physical Therapy on COVID-19 patients.

Keywords: Breathing exercises, COVID-19, Physical therapy, Respiratory therapy, World Health Organization

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Introduction:

According to the World Health Organization (WHO), Coronavirus disease 2019 (COVID-19) is an infectious condition caused by a newly discovered coronavirus. The first case of the novel coronavirus 2019 (COVID-19) was reported and confirmed in Wuhan, Hubei Province, China in December 2019. On March 11, 2020, WHO declared COVID-19 a pandemic. Afterward, the World Health Organization reported 69,808,588 cases of COVID-19, including 1,588,854 deaths (as of December 12, 2020). A Beta coronavirus named SARS-Cov-2 is the cause of COVID-19 that has drastic consequences on the lower respiratory tract which results in pneumonia.(1) Coronavirus also affects different organs such as heart, liver, kidneys, gastrointestinal tract, brain, and organ systems such as blood and immune system.(2) Most people affected with COVID-19 experience mild to moderate symptoms such as fever, continuous cough, myalgia, and dyspnea; while elderly people and those with underlying health conditions such as cardiovascular conditions, diabetes, and chronic respiratory diseases have symptoms varying from person to person and are at greater risk of having severe symptoms and thus require hospitalization.(3, 4) Also, multiorgan

failure, shock, acute respiratory distress syndrome, cardiac failure, arrhythmias, and renal failure occur in different people and ultimately cause the death of the person.(5, 6) Moreover, some articles state that the survival of COVID-19 patients is lower when associated with Acute Respiratory Distress Syndrome (ARDS) as compared to when associated with other etiologies. In other cases, it may also be associated with acute kidney injuries.(7, 8)

The spread of the COVID-19 occurs through the respiratory droplets produced whenever the infected person coughs, sneezes, talks, or breathes.(4, 9) Further research confirm airborne transmission to be the main cause of the spread in indoor places because the composition of the virus is such that it contains water, salt, and organic material. Whenever, the water evaporates, the virus becomes so lightweight that it suspends in the air, multiplying the risk of infection.(10, 11)

So, the early detection of the virus is necessary for controlling the spread and transmission. The virus is detected by Polymerase Chain Reaction (PCR) and antigen-antibody test.(12) The sample is taken from the nasopharynx and throat and via laboratory testing. A high C-reactive protein, erythrocyte sedimentation rate, lactate dehydrogenase, creatinine, and prolonged prothrombin time may be present in patients with COVID-19.(4, 8) The other method for detecting COVID-19 is by the radiological examination of the chest which includes a chest X-ray and CT scan showing ground-glass opacities and consolidation

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in the lung periphery, while the normal lung does not have these characteristics.(13)

The first and foremost thing to protect against COVID-19 is to take proper measures. Fundamental hand sanitization including regular hand washing after every five minutes for at least 20-30 seconds and the wearing of face masks will help against the spread of the virus. Maintaining a safe distance of at least 6 feet, avoidance of crowded places, and disinfecting the most touched places are all defensive techniques against COVID-19.(9)

The primary objective of this study was to determine the effect of physical therapy in patients infected with COVID-19 as this pandemic has placed an enormous amount of stress on health care professionals. So, a proper response is needed to decrease the severity of symptoms. The management of symptoms is a multidisciplinary approach comprising of health care professionals from different fields working effortlessly throughout the day and night ensuring that patients receive effective rehabilitative and physical therapy services.(7, 14)

Methods & Results:

Search strategy:

An online search was carried out using different search engines including Google Scholar, Pubmed, and Cochrane from October 2020 to December 2020 to look for the role of physical therapy and its effects on COVID-19 patients.

Treatment strategies:

Since the vaccines are under production and there is no effective vaccine available for the

treatment of a many patients yet, social distancing is the primary tool to stop the transmission of the virus.(1) Furthermore, supportive therapies including oxygen therapy, pharmacological therapy, and physical therapy such as active range of motion, cycle ergometry, pre-gait exercises, and ambulation help reduce the severity of symptoms. (8)

Physical therapy Role:

In assisting hospitalized patients through respiratory support and mobilization, the physical therapist plays a significant role. The management of physical therapy intervention should be customized to the need of the patient according to their level of severity of the disease so that appropriate time and treatment should be given to the patient to improve their quality of life. Physical therapy management comprises of two components: Respiratory training and active mobilization. Respiratory training can be done for airway opening, to improve the vital capacity of the lungs, mobilize secretions, and to strengthen the muscles of respiration. Breathing exercises such as diaphragmatic breathing, active cycle of breathing techniques (ACBTs), thoracic expansion exercises, and inspiratory and expiratory muscle training are different techniques of respiratory support. Less affected patients should be encouraged to perform breathing exercises independently. Moreover, prone positioning for at least 12-16 hours a day enhances ventilation in adult patients affected with severe ARDS.(15)

On the other hand, active mobilization comprising of bed mobility, pelvic rolling exercises, bridging, ankle pumps, all can be

Table 1: The role of Physical Therapy in patients infected with the coronavirus. (4)

RESPIRATORY SUPPORT	ACTIVE MOBILIZATION	DISCOURAGE PERIOD OF INACTIVITY
Vital monitoring	Avoid muscle contractures and atrophy (positioning, ROMs, PROMs)	Prolong bed rest
Positioning	Encourage remodeling of the patient (pre gait exercises, ambulation, gait training, isometrics, balance training)	Immobility
Postural drainage		Positioning after every 2 hours to prevent pressure sores
Respiratory muscles strengthening		
Training of respiratory muscles via different breathing techniques (active cycle of breathing techniques, diaphragmatic breathing, segmental breathing technique, percussions, vibrations)		

performed to overcome the problems, restricting activities of daily living and for the improvement of physical function as shown in the table (Table 1). (3, 4) Patients should be encouraged to perform light intensity training to improve muscle strength and functional outcome. Interventions to improve endurance and balance should be progressed gradually and gait training should be started using different walking aids, for example, parallel bars and walkers.(16) All these early rehabilitative interventions have a significant impact on patient outcome thus minimizing severity of symptoms and therefore, reducing the duration of the hospital stay. (17)

The physical therapist must take proper measures to ensure their own safety as they are at risk of getting infected due to close contact with patients of COVID-19. So, unnecessary contact with COVID-19 patients should be avoided. In cases where direct delivery of exercise programs is not required, the physical therapist must use telehealth, which is absolute management for communicable diseases, to deliver care while minimizing their contact with infected people.(18)

Conclusion:

COVID-19 is an infectious condition that spreads from person to person by respiratory droplets and has caused many deaths worldwide. Protective strategies including the use of face masks, good hand hygiene, and social distancing should be practiced minimizing the spread of the virus. The physical therapist plays a significant role in managing symptoms of respiration and improving the overall quality of life. Early rehabilitative care has a positive effect on critically ill patients and it gives more benefit to the patient and reduces the length of the hospital stay.

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Author Contribution:

Gul S: Conception, design, drafting the work and agreement to be accountable for all aspects of the work.

Noor-ul-Huda H: Revising the article critically for important intellectual content, final approval of the version to be published and agreement to be accountable for all aspects of the work.

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