

ORIGINAL ARTICLE

**Evidence-based rehabilitation among adult patients with COVID-19 infection:
An integrated literature review**

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ABSTRACT

The purpose of this integrated review is to provide evidence-based rehabilitation among adult patients with coronavirus. Four database were used for the integrated literature which took six months to complete and finished in July 2021. Search databases include PubMed, Medline, the Library of Latin American, Caribbean Literature in Health Sciences, Pedro Physiotherapy Evidence Database and Google scholar. The studies reported that patient who suffered from coronavirus (COVID-19) indicate the respiratory and musculoskeletal disorder and impaired functionality. Taking into consideration the majority of people affected by coronavirus disease worldwide, it can be estimated that physiatrists and physiotherapists will become more and more concerned in the care of these patients, in order to recover the pulmonary function, psychological and physical competence, and also to bring back a good patient ADL.

INTRODUCTION

The coronavirus disease pneumonia pandemic burst in December 2019 in the city of Wuhan (China) and increase very fast over the state and each and every continent of the planet (1). The microorganism examined throughout the entire genome series belongs to the beta coronavirus genus, and it is also referred to as a novel coronavirus causing COVID-19 pneumonia, as defined by the World Health Organization (WHO) (1).

A medical condition such as high blood pressure, respiratory issues, cardiovascular disorders, and musculoskeletal (MSK) problems seems to play a significant role as a primary predisposing factor

for the severity of the coronavirus infection. Additionally, it is considered a critical and unmodifiable predisposing factor for the severity and longevity of the coronavirus infection (1). The symptomatic progression of the patient with coronavirus is divided into two stages acute-stage and post-acute stage Acute-stage in which breathing manifestation induce and a post-acute stage in which the patient can indicate manifestation associated to prolonged immobilization (2).

Physiotherapy has high command on the management of musculoskeletal pain. Exercise is an essential part of post COVID-19 rehabilitation as it recovers physical condition, decreases dyspnea, recovers balance and coordination, raises

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muscle tolerance, recovers memory, and decreases stress. Furthermore, it also helps to reduce pain in the patients who have been hospitalized with low intensity (3).

Respiratory physiotherapy plays a very important role in the multi-disciplinary treatment and is a very important part of its enhancement and protection of patients with the respiratory disorder (4). Along a broad scale of task, physiotherapist helps with the therapy of patients of numerous diseases and ages with chronic and acute state.

In the sufferer of coronavirus, the elderly people are more at risk with reduced immunity which can induce chronic disorder including oncological pulmonary condition. The part of physiotherapists in managing these patients is important. Presently, there is a small number of research-based details on the physiotherapy of coronavirus COVID-19 patients with acute and chronic breathing failure in addition to symptoms for controlling the exposure with the contaminated patient (5).

Chest physiotherapy focus on to assist patient with a breathing disorder to improve and support their respiratory function. Various methods are used such as, positive expiratory pressure operator, breathing exercise, autogenic drainage, education, and workout are utilized in chest physiotherapy. A decrease in workouts sufferance and a rise in suffocation with breathing tasks are usual disorders shown in a patient with breathing diseases (6). The major facts that are to be examined in seriously ill coronavirus patients are symmetrical pneumonia and acute breathing disorder (7).

These suggestions can provide therapeutic practice recommendation for the physiotherapist (7). Consequently, this research explores the scientific proof in physiotherapy and the functionality in coronavirus that can guide physiotherapist in their routine performance (1). The purpose of this integrated review was to provide evidence-based rehabilitation among adult patients with coronavirus.

MATERIALS AND METHODS

Integrated literature search was conducted for six months on four databases and completed in July 2021. Search databases include PubMed, Medline, (library of Latin American and Caribbean Literature in Health Sciences), Pedro Physiotherapy Evidence Database and Google scholar. This review was reported according to the guidelines of PRISMA for systematic review and meta-analysis.

Eligibility Criteria

The study was published in English about coronavirus (COVID-19) and aspects associated to oxygen therapy, mechanical ventilation, and physiotherapy and MSK were included. Editorials, reviews, consequences, original articles and Meta-analysis were also added in current study.

Inclusion Criteria

1. Study on participants who were diagnosed with COVID-19
2. Adult population age (18-25)
3. Studies focused on musculoskeletal and respiratory system treatment
4. Published researches from 2019 to 2021
5. Study designs were: randomized controlled trial, cross sectional studies, cohort, case series, reviews and meta-analysis
6. Respiratory, muscular function and functionality of COVID-19 patient
7. Assessment, diagnosis and Physiotherapeutic interventions of COVID-19 patient
8. Papers published in English
9. Professional and scientific journals

Exclusion Criteria

1. Patients suffering from any other infectious disease
2. Any other condition handling the rehabilitation process
3. Animal trials

4. Theoretical research
5. Unregistered clinical trials
6. Publications written in language other than English

Selection of Studies

Titles, abstract and full text of related articles were reviewed by two independent researchers for eligibility. Consensus was developed by discussion and on the opinion of third researcher the articles were included.

Search Strategies

The search strategies for this integrative review were with the association of the subsequent terms: First association: coronavirus and COVID-19 infection. Second association: COVID-19 and physiotherapy. Third association: musculoskeletal association and COVID-19 infection. Fourth association: treatment prevention and diagnosis and coronavirus. Articles were selected through this search that encounters the inclusion criteria.

Data Extraction

The included articles were separately reviewed by one author and then reviewed by second author separately. After that they compared the findings and agreed upon on discussion. The abstract contains the extraction of sequent data: consequences of physiotherapeutic showed in COVID-19 patient and performance, year of publication and authors in the evidence and assessment apparatus. Eventually the results show the clinical involvement in coronavirus (COVID-19) in breathing function was assessed for the production of evidence.

Quality Assessment

The studies were assessed for their quality to reduce biasness by rating them, considering various methodological criteria and potential sources of bias.

Data Analysis

The information extracted from the articles that met the criteria was systematically arranged and presented in a narrative format, providing a cohesive and summarized overview.

RESULTS

The Table 1 shows the evidence found on the deficiency of respiratory function in (COVID-19) coronavirus and musculoskeletal problems.

DISCUSSION

The basic purpose of this integrated literature review is to evaluate scientific evidence about physiotherapy and functionality among adult coronavirus patients. The transference in the air generally takes place when the patient coughing and contact with the environment or surface. It is also noticed that expired in air is the cause of virus spread and eventually, the chance of spread of infection in all hospitals on its peak (1). Exhaled air give rise to virus distribution and later the danger of infection and outspread of the virus that increase the infection and aerosolization and health workers are not indicated related to the lack of a proven advantages in the therapy of hypoxemic respiratory failure. The average estimated time for coronavirus is 5.1 days (3 to 7 days) and more than 2 weeks (12.5/11.5 days) in 97% of individuals. Many manifestations of coronavirus are shortness of breath 19%, cough 68%, fever 89%, headache, loss of smell and taste, nausea, runny nose, body pain and infection to lungs (5). Physiotherapy has high command on the management of musculoskeletal pain such as myofascial release techniques exercises modalities and soft tissue mobilization. Exercise is an essential part of post COVID-19 rehabilitation as it recovers physical condition, decreases dyspnea, recovers balance and coordination, raises muscle tolerance, recovers memory, decreases stress and also help to reduce pain in patients who have been hospitalized with low intensity (13).

Firstly, the virus may increase the entrance to the nervous system through blood and contaminate leukocyte or endothelial cells and peripheral nerves. Secondly, the virus is the source of pneumonia which may be the outcome of extensive hypoxia which could cause brain and other nerve cells injured. The method via which the injury take place are hypercarbia, hypoxia, anaerobic metabolism, peripheral vasodilatation which eventually the outcome in brain edema and neuronal inflammation (14).

All the patients hospitalized due to coronavirus used oxygen therapy known as invasive ventilation methods should be done with distinctive protective apparatus and in those patients who evolve shortness of breathing, peripheral oxygen desaturation and increased heart rate non-invasive ventilation can be done. The authors researched and suggested only the utilization of protective masks with the double lame circuit could reduce chances of transmission of infection in the air (1).

In hospitalized patients with coronavirus, the plan of respiratory treatment is to recover manifestations of depression, reduce anxiety and dyspnea, decrease problems, stop and recover disability, decrease disorder, protect function to the maximum to the minimum point, and recover ADL (15).

Scientific research from the experienced professionals focuses to manage patient with COVID-19. It shows that due to the dissatisfied outcomes higher chance of out spreading the virus in accessibility of the suitable interfacing higher failure rate. Non-invasive ventilation should re-explore with substantial assessment and Diagnostic accuracy and should not be primary ventilatory approach considered for patient with coronavirus so that it can be generalized high flow of nasal cannula (1).

CONCLUSION

Taking into consideration the majority of people affected by coronavirus disease globally, it can be

estimated that physiatrists and physiotherapists will be more and more concerned in the care of these patients, to recover pulmonary function, psychological and physical competence, and to bring back a good patient ADL.

CONFLICTS OF INTEREST

The authors declared no conflict of interest.

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Table 1. Evidence on insufficiency in respiratory function at coronavirus (COVID-19) and musculoskeletal problems

Sr. No	Type of study	Aim	Evidence	Reference
1.	Review	Review practical thoughts and organization for comprehensive	Coronavirus may have numerous cardiovascular repercussions making constant checking and a multidispensary technique important in the care of the patient that are becoming essential	Bouadma <i>et al.</i> 2020 (8)
2.	Case report	To explore the pathological aspect of (SARS-COV-2) COVID-19 by Post- Mortem Biopsies	The existence of myocardial infiltration by interstitial mononuclear contaminated cells at Autopsy exhibiting the direct effect of covid-19 on the myocardium	XU <i>et al.</i> 2020 (9)
3.	Retrospective analysis	To discover the perfect extent by using real-world data	All patient (41%) infected due to coronavirus is hospitalized using oxygen therapy during the course of their Arabian and this number increases to 70% in all the cases with very serious evolution	van den Boom <i>et al.</i> 2020 (10)
4.	Guide clinical practice	Suggested the practical action of physiotherapy in handling the covid-19 patient	Patient with increased requirement for oxygen therapy for mention to physiotherapy for airway clearance specially in those patients' doors with use of productive operators and cup deficiency and intensive care unit involvement and early optimization of care is the suggested.	Thomas <i>et al.</i> 2020 (11)
5.	Practical clinical guideline	Guide the handling of emergency unit and covid-19 patient Suggested the practical action of physiotherapy in handling the covid-19 patient	Hypoxemia is the severe situation might recommend this function of systems and organ the utilization of a high flow nasal cannula should ideally be applied on patient in bed with a negative pressure room utilizing individual protective apparatus	Alhazzani <i>et al.</i> 2020 (12)