

## Telephysiotherapy - A Rapid Evolution During Covid-19: A Review Article

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### Abstract

**Background:** COVID-19 pandemic has triggered governments worldwide to enforce certain restrictions to prevent the spread of the disease. Additionally, the healthcare industry was also redirected towards the acuity level of rehabilitation at a higher level of care during the pandemic. The rapid evolution of technology has influenced healthcare professionals to adapt to this change and deliver their consultation and suggestions remotely.

**Objectives:** The objective of this study was to evaluate different research articles providing telephysiotherapy in different physiotherapeutic conditions during the COVID-19 outbreak.

**Search Strategy:** Various articles have been studied to create this literature review. The database was probed from various journal sites such as PubMed, Science Direct, Research Gate, Cochrane and Google Scholar. The inclusion criteria were the use of telemedicine and rehabilitation during the COVID-19 phase. Only randomized control trials were included in the present study. The articles were identified with keywords such as telerehabilitation, telemedicine, telephysiotherapy, COVID-19, physical therapy and exercises.

**Results:** According to the literature review there were many conditions where telephysiotherapy was used. Various physiotherapeutic interventions were provided to patients during the pandemic phase. Similar to knee OA, multiple sclerosis, fibromyalgia cancer and many other conditions.

**Conclusion:** All authors studied and discussed the results and led to the conclusion of the study. Telephysiotherapy can be considered a remote tool for the treatment of the patients. It is a measure to improve the quality of life and the physical and functional status of an individual.

**Keywords:** Telephysiotherapy; COVID-19; Physical Therapy

### Abbreviation

MERS: Middle East Respiratory Syndrome; SARS: Severe Acute Respiratory Syndrome; MSD's: Musculoskeletal Disorders; OA: Osteoarthritis; MS: Multiple Sclerosis

### Introduction

COVID-19 is an infectious disease caused by the most recently discovered coronavirus. Coronaviruses are a large family of viruses that may cause illness in animals and humans. In humans, several coronaviruses are known to cause respiratory infections ranging

from the common cold to more severe diseases such as Middle East respiratory syndrome (MERS) and Severe Acute respiratory syndrome (SARS) the most recently discovered coronavirus disease called COVID-19 [1]. The most common symptoms of COVID-19 are fever, dry cough and tiredness. Other symptoms that are less common and may affect some patients are nasal congestion, headaches, conjunctivitis, sore throat, loss of taste or smell, rash on skin, discoloration of fingers and nails, aches and pain. Coronavirus spreads through droplets of saliva or discharge from the nose; when an infected person sneezes or coughs. As no specific vaccines are available at this time it is important to practice social distancing and practice respiratory etiquettes [2]. The COVID-19 pandemic has triggered governments worldwide to enforce certain restrictions such as mandatory quarantines, closure of schools and colleges, promoting private sector industries for work from home and social distancing to prevent the spread of the disease [3].

Additionally, the healthcare industry was also redirected towards the acuity level of rehabilitation at a higher level of care during the pandemic. Due to increase of the deadly spread of the virus medical team has increased the use of telemedicine which includes spread of medical information through electronic mediums to the individuals [4]. The rapid evolution of technology has influenced health care professionals to adapt to this change and deliver their consultation and suggestions in a remote way [5].

In response to this new panorama of medical practice, World Confederation of Physical Therapists proclaimed the statement on initiating the use of telerehabilitation to improve patient care and offer help to society using this new model [6]. At International level, different organization's such as Chartered Society of Physiotherapy, Australian Physiotherapy Association, Italian Physiotherapy Association, American Physical Therapy Association [6] has already expanded measures to implement telerehabilitation.

Telephysiotherapy is commonly known as e-physiotherapy or online physiotherapy. Physiotherapy is a clinical application of diagnostic, therapeutic and preventive services via two-way interactive technologies. In telephysiotherapy we use necessary tools such as the Internet, communicating tools and media such as mobile phones and laptops [7]. Through these tools we share data and information such as videos, pictures and other materials to heal the patient. This can be done using tools such as videoconferencing, E-mails, web-based communication apps and wearable technologies.

Physiotherapists adopt both hands-on and hands-off measures for the treatment of acute and chronic diseases. Some of the hands-on measures of physiotherapy include the use of manual therapy such as mobilization techniques (Maitland, Mulligan, McKenzie, Kalternborn, and many more), Application of electrical modalities such as (IFT, therapeutic Ultrasound, LASER, Diathermies etc.) while some hands-off measures include patient education, self monitored questionnaires and therapeutic exercises (Figure 1).

**Figure 1:** Physiotherapy Measures.

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Several systematic Reviews and meta-analysis have assessed the role of telerehabilitation post operatively such as arthroplasties (knee, shoulder, hip) and other surgeries [8] using the existing past year published literature this study aims to report clinical evidence used for physiotherapeutic management using telerehabilitation of different disorders, describe its feasibility as well as complications faced by the therapists. With recent advancements in the IT sector, there has been a rapid increase in the web-based platforms such as Skype, Microsoft teams, Zoom etc. which are available for use by healthcare providers and patients [9]. During the COVID-19 pandemic the face-to-face interface was disturbed (Figure 2). The disturbed interface of in-person physiotherapy treatment was rejuvenated using telephysiotherapy.

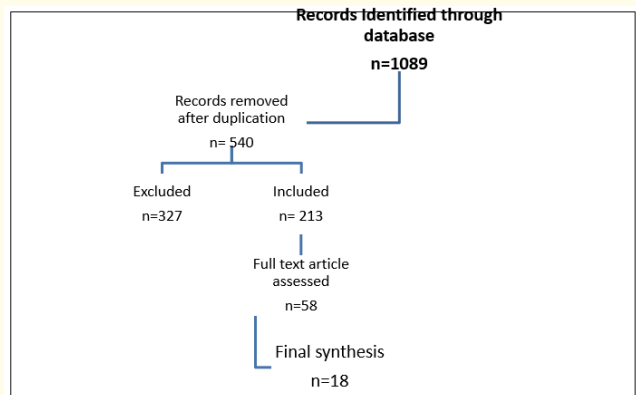
**Figure 2:** Disturbed interface during COVID-19.

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**Methodology**

Various articles were studied by all the authors equally to create this literature review, and the work done by all the authors was equal from selection to screening to review and draft of the article. The database was probed from various journal sites such as PubMed, Science Direct, Research Gate, Cochrane and Google Scholar.(table 1) Where the inclusion criteria was use of telemedicine and rehabilitation during COVID-19 phase. Only randomized control trials were included in the present study. The articles were

identified with keywords such as telerehabilitation, telemedicine, telephysiotherapy, COVID-19, physical therapy and exercises. Furthermore, the PEDro scale was used to appraise evidence. Literature with PEDro score below 6 was excluded from this review study. A total of 1089 articles were reviewed, including full text and abstracts. Only 18 articles were selected for this review (Figure 3).



**Figure 3:** PRISMA flow diagram.

Flow chart depicting the data collection from google scholars, PubMed, Cochrane, Medline etc. Where the inclusion criteria was use of telemedicine and rehabilitation during COVID-19 phase. Only Randomized Control Trials were included in this study. The articles were identified with keywords such as telerehabilitation, telemedicine, telephysiotherapy, COVID-19, physical therapy and exercises.

**Results**

According to the literature reviewed there were many conditions where telephysiotherapy was used. Various physiotherapeutic interventions were provided to the patients during the pandemic phase.

**Management of knee osteoarthritis**

Jones, *et al.* 2021 [10] conducted a non-inferiority trial comparing in-person physiotherapy with video consultations for people with knee OA. In this trial 15 physiotherapists were provided with a structured program to provide the best treatment for knee OA, including a protocol consisting of exercises, patient education and physical activity. In this approach, the physiotherapist experiences of e-platforms and their impact were also chosen. The E-platforms used for this care were Skype, Zoom and face time. This e-learning

approach features both synchronous and asynchronous learning. It was developed on the basis of a Miller pyramid called the PEAK [11] trial training program (Figure 4). The study showed that physiotherapists accepted the e-platform mode to deliver treatment despite their lack of familiarity with professional development entirely using the internet. Physiotherapists value both the theoretical and practical modes of rehabilitation.

**Figure 4:** Miller Pyramid focusing on Physiotherapy Exercise and Physical Activity for Knee Osteoarthritis (PEAK).

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The study also has strengths such as evaluation of e-learning programs that are available to many clinicians globally. The limitations of the studies included the small sample size. Participants were bound by clinical trial agreement to complete training and they were financially compensated for their time.

### Management of multiple sclerosis

Lowe., *et al.* 2021 aimed [12] to develop and evaluate individual-centric physical activity with a specific focus on people with progressive multiple sclerosis and multiple disabilities. Regular

physical activity is regarded as an important component [13] of long-term management of MS. Physical activity may have a positive impact on MS symptoms such as mobility, cognition, fatigue and psychological and social benefits. This training program was conducted in two phases. Phase 1 included qualitative interview studies, which were conducted by identifying barriers and facilitators of physical activity using past patient experiences. Information from physiotherapists was also collected using self-management techniques. Phase 2 included intervention development and feasibility testing, which was made up of a multi-user web-based online physical activity tool, up to six physiotherapy consultations, and a training package for physiotherapists about self-management with progressive multiple sclerosis. The training exercise program was delivered remotely on Zoom, which was recorded and made available online. There were certain limitations faced, such as some technical issues experienced with the database, mainly that the data collection forms were locked part way through two participants completing their baseline measures, and three participants were able to complete their 6-month follow-up prior to their intended follow-up window. These errors were rectified as soon as the central team became aware. Although standard database testing was employed, the scheduling of access to forms was not initially tested, and this experience highlights the necessity for thorough testing prior to database release, especially when participants are entering their data themselves.

### Management for fibromyalgia

Garijo., *et al* 2021 studied [14] the immediate effects of telerehabilitation program based on aerobic exercise in women with fibromyalgia (FM) which is a chronic disorder which has persistent pain which is associated with psychological distress, pain catastrophizing and lower levels of physical function among other symptoms [15]. Clinical guidelines for the management of fibromyalgia recommend the use of non-pharmacological therapies as first-line of treatment. Aerobic exercise is considered to be one of the most accepted interventions [16]. To conduct this trial, 37 patients diagnosed with FM were included. The telephysiotherapy group included, a 15 week exercise protocol which consisted of 30 sessions (2 sessions per week), each session lasted for 50 minutes. The intervention included low-impact activity movements guided by the video according to the protocol by Schachter., *et al* [17]. The warm-up included stretching, mobility and active movements. The cool-down part was based on the stretching of the major muscles

(3 sets of 30 s) and breathing techniques. The physiotherapist, who performed the intervention, adapted and controlled all the exercises to avoid any adverse events and to ensure patient safety.

This study has certain limitations such as men were not included in this study which restricted the study to be used on a generalized population. In addition, the intervention was not compared to the other experimental interventions. Lastly, this study lacked follow-up analysis due to which long-term effects were not reported.

### Management for COVID-19

Adly, *et al.* 2021 analyzed [18] telemanagement of home isolated COVID-19 patients using oxygen therapy with non-invasive positive pressure ventilation and physical therapy techniques. To capture the transition from an in-person to video-conference intervention delivery approach in response to a pandemic outbreak. Sixty patients were recruited for this study. A real-time video conference was established between the patient and the physiotherapist for training, directing and supervision purposes. Two groups were created to provide the intervention. Group A was administered an oxygen concentrator with BiPAP using an AirFit F30 face mask, which was consistent across all patients, clarified in detail, and accomplished via teleconference for each patient which was supervised by an expert respiratory physiotherapist. Group B underwent osteopathic manipulative respiratory and physical therapy techniques such as prone reverse Trendelenburg positioning for 4 hours a day, cephalic traction, MET for scalene muscles, rib raising techniques, sub-occipital area intermittent rhythmic pressure, pedal lymphatic pumps, thoracic inlet myofascial release and diaphragmatic doming for three to five sequential respiratory cycles. This study had certain limitations such as small patient size and osteopathic manipulative respiratory and physical therapy techniques may have a role in elevating recovery rates and improving outcomes of patients with COVID-19.

### Management of cancer

During the global pandemic of COVID-19, Synder, *et al.* 2021 studied [22], the effect of videoconference yoga interventions for cancer patients on e-platforms such as zoom and facetime, if the participants did not have any suitable device then institution provided with the device. A standard yoga protocol was established according to the International Association of Yoga Therapist (IAYT)

including joint loosening with breath synchronization, asanas, pranayams and guided meditation [23] overall the participants expressed a preference to see yoga therapists in-person but still they enjoyed participating in remote yoga sessions.

### Management of hemiparesis

Smith, *et al.* 2020 [19] studied the combined effects of telehealth and modified constraint-induced movement therapy for individuals with chronic hemiparesis. Stroke is a prevalent cause of disability and death worldwide. Approximately, 80% of individuals with stroke experience difficulties in performing daily activities [20]. The 6 week intervention period was conducted twice a week. Twenty participants were recruited for this study. Web-based technologies such as Google Hangouts and Adobe connects were used. The participant and the therapist met, and the computer screens were adjusted allowing full view of the hemiplegic UE and hand in order to observe participants' engagement in tasks. It provides with fine and gross motor exercises that help in daily life activities. The American Occupational Therapy Association's (AOTA) position on telehealth sets guidelines for the delivery of occupational therapy services using telehealth to promote participation (AOTA, 2018). Occupational therapy practitioners must adhere to occupational therapy practice guidelines and ethical practice, whether in-person or using web-based technologies to provide services [21].

### Management for dementia

Gately, *et al.* in 2020 [24] studied the caregiver's satisfaction level using telehealth for dementia. They used the VA Bedford Healthcare System to examine satisfaction with video telehealth. Ten caregivers of veterans with dementia participated in this study. Ratings of caregiver satisfaction, measured by nine Such asrt scale items including ability to see and hear, were examined in relation to person and visit-related contextual factors extracted from research assistants' field notes, to develop an in-depth understanding of caregiver experience. Person factors included caregiver age, gender and veteran cognitive status. Visit-related contextual factors included the occurrence of technical glitches. Caregiver visit satisfaction was overall positive, with exceptions related to technological glitches and the presence of a person with dementia during the visit.

| Search database | Keywords                                    | Available literature |
|-----------------|---|----------------------|
| PubMed          | COVID-19, online physiotherapy              | 4                    |
| Science Direct  | Telerehabilitation, COVID-19                | 34                   |
| Google Scholar  | Telephysiotherapy, pandemic 2019            | 984                  |
| Cochrane        | Physiotherapy, telerehabilitation           | 32                   |
| Research gate   | COVID-19, telerehabilitation, physiotherapy | 35                   |
| Total           |   | 1089                 |

**Table 1:** Search Strategy.

### Discussions

The aim of this study was to evaluate different research articles on the use of telephysiotherapy in different physiotherapeutic conditions during the COVID-19 outbreak. After reviewing the present literature with different criteria of research involving RCT, it was found that telephysiotherapy is used in different conditions such as knee OA, dementia, stroke, multiple sclerosis, cancer and even in global pandemics such as COVID-19.

This study has several strengths and limitations. The strength of this study is the recent advancement of technology which are available for healthcare workers. Patients can gain benefits such as prevention of readmissions, reduction of hospitalization rates, immediate access to OPD services, early discharge and improvement of health outcomes and quality of life. Telephysiotherapy is not only beneficial for patient but also for the therapist involving adapting and duration in accordance to the patient’s needs, it helps in reducing the waiting list which increases sustainability, lastly group therapy programs can also be provided using e-services.

Limitations include during the acute stage, evidence is still lacking on the usefulness of telephysiotherapy, aside from some professional recommendations based on anecdotal evidence. However, it should be noted that physiotherapy is an individualized treatment based on the patient’s presentation. Therefore, when patients present with symptoms that can benefit from physiotherapy, it may be given while the patients may be closely observed for any adverse events.

### Conclusions

All authors studied and discussed the results and led to the conclusion of the study. Telephysiotherapy can be considered a remote tool for the treatment of patients. It is a measure to improve the quality of life and the physical and functional status of an individual.

### Competing Interests

No competing interests are there.

### Funding Statement

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### Ethical Standards

This material is the authors’ original work, which has not been previously published elsewhere.

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