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EFFECTIVENESS OF TELE-PHYSIOTHERAPEUTIC CONSULTATIONS IN MUSCULO-SKELETAL CONDITIONS- A LITERATURE REVIEW

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ABSTRACT

Background: Since past two years, as Covid Era hit the world, there have been a gradual progress in the number of rehabilitation studies and technological development. Although the term Tele-Rehabilitation is known for decades but it got the spotlight in this scenario. The term "Telerehabilitation" can be defined as the use of internet or telecommunications to provide physical, occupational or speech therapy to patient in their homes or any comfortable environment.

Purpose: To determine the effectiveness of Tele-Rehabilitation Strategies in patients with musculoskeletal disorders.

Methodology: A comprehensive review of the available literature was conducted using electronic databases namely Google scholar, PubMed, Science Direct published between April 2007 and January 2021.This review includes studies which examines following components namely validity, reliability, patients' feedback and satisfaction of tele rehabilitation-based Physiotherapy assessment and treatment in Musculoskeletal conditions other than post Covid complications.

Results: A total of 18 rehabilitation based researches were taken out of which 15 studies showed the increased acceptance with better finding of tele- rehabilitation in accordance with musculoskeletal disorders. On other hand certain limitation in assessment of lumbar spine posture, orthopedic special test, neurodynamic test and scar assessment were found in 3 studies.

Conclusion: Tele-Rehabilitation based physiotherapy was found to be more feasible with good validity and reliability but in certain areas orthopedic specialized test and treatments require face to face or in clinics mode of operation.

Keywords: Tele-Physiotherapy; Tele-Rehabilitation; Musculoskeletal; Physiotherapy; Tele-communication; Disorders.

INTRODUCTION

Worldwide musculoskeletal disorders are a widespread and increasing health problem. [1] The international Labour Organization and WHO has referred musculoskeletal disorders as new epidemic that should be researched and solved. [2] Musculoskeletal Disorders or MSDs are injuries or disorders that affects the functioning of musculoskeletal system. (i.e., muscles, ligaments, tendons, bones etc.). The underlying cause of these disorders are usually multifactorial which include physical, ergonomically, regional and psychosocial factors. Individuals who have work of excessive repetition, awkward postures and heavy lifting usually suffered from these disorders. [1]

With increasing demographic projections in elderly population musculoskeletal disorders are becoming common problem in this era. Literature shows that in geriatric population loss of mobility and physical dependence basically results from either arthropathies or fracture cases.

As familiar with COVID-19 pandemic, it has affected all aspects of health care delivery systems. To protect health care workers and patients across the country from the risk of disease transmission, there is a very important need to adapt different strategies in order to provide quality treatment to patients. This led to a whole new world of tele-rehabilitation.

The term Tele rehabilitation can be defined as the use of internet or telecommunications to provide physical, occupational or speech therapy to patient in their homes or comfortable environment. [3] As per on the goal of the treatment tele rehabilitation or tele-Physiotherapy can be provided in many different forms. The most common among them is video conferencing which provides direct contact between patient and physiotherapist. After assessment the protocol of the treatment is given to patient in form of video recording, written regime or sometimes, they are even guided through an app. [4] Tele Physiotherapy programs may include monitoring of physiological signals and vitals of the patient depending upon his health. However, it may be necessary to perform a number of home visits depending upon the situation and condition of the patient. [4]

Although the term Tele- Rehabilitation is known for decades but it got the spotlight in now time. So, it is necessary for one to determine its validity, reliability and patient's satisfaction as Tele-Rehabilitation is different from conventional mode of treatment.

In this literature review, our main objective is to determine the effectiveness of Tele-Rehabilitation Strategies in patients with musculoskeletal disorders.

METHODOLOGY

A comprehensive review of literature was conducted using a number of electronic databases: Google scholar, PubMed, Science Direct published between April 2007 and January 2021.The studies examine the validity, reliability, patients' feedback and satisfaction of tele rehabilitation-based Physiotherapy assessment and treatment.

A total of 53 results were obtained with keywords Tele-Physiotherapy, Tele-Rehabilitation, Musculoskeletal, Physiotherapy and Tele-medicine. Out of which 13 were related to musculoskeletal disorders due to Covid-19 and 22 were related to conditions other than musculoskeletal.

Remaining 18 researches were taken for this study and reviewed for the effectiveness of tele-physiotherapy in musculoskeletal disorders.

During the screening of the articles, the following inclusion and exclusion criteria were used:

Inclusion Criteria

1) Selected articles in English language.

2) Population: Adult population with musculoskeletal disorders.

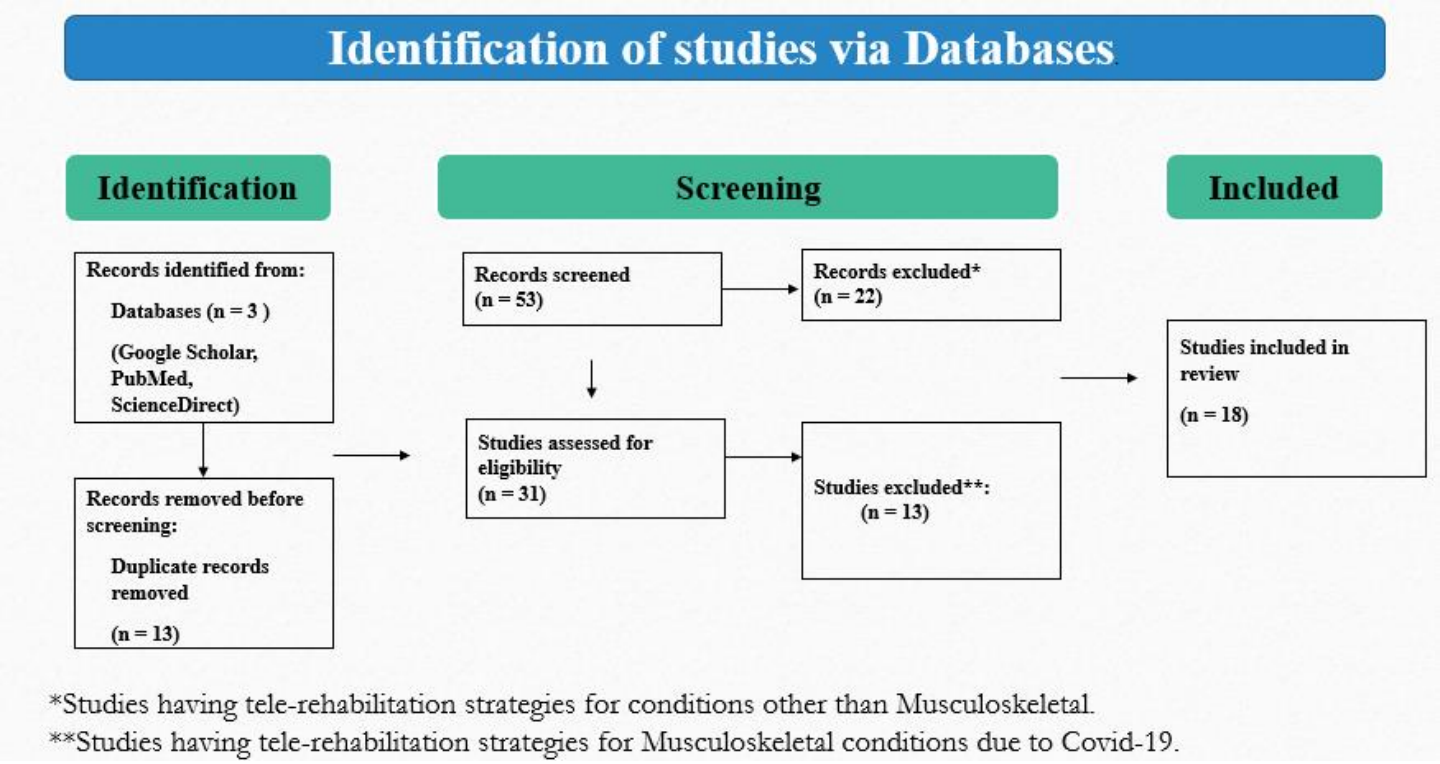
3) Intervention: Use of Tele-Physiotherapy as a tool for rehabilitation.

4) Outcome: Effect of Tele-Physiotherapy intervention on Musculoskeletal Disorders.

Exclusion Criteria

1) Musculoskeletal Disorders due to Covid-19.

2) All other forms of intervention or rehabilitation except musculoskeletal disorders.



*Studies having tele-rehabilitation strategies for conditions other than Musculoskeletal.
**Studies having tele-rehabilitation strategies for Musculoskeletal conditions due to Covid-19.

Results

After data extraction based on the inclusion & exclusion criteria, the results are listed in following table:

S.No.	Author	Article type	Population	Measurement outcome	Tool of measurement
1	Adesola C. Odele et.al. in Dec. 2013 [5]	RCT (n = 50)	Patients with Osteoarthritis of Knee. Control group: Exercise in OPD. Thrice/week x 6 weeks (n=25).	No significant differences in pain intensity and physical function.	IKHOAM VAS

			Experimental group(n=25) : Tele-rehab for 6 weeks.		
2	Leah Steele et.al. in Nov 2020 [6]	Case study (n=22)	(n=22) All subjects were given tele rehab as well as face to face physical therapy.	Moderate Validity (59.72%) Strong Reliability achieved Inter-Rater Reliability (73.08%) Intra-Rater Reliability (100%)	Postural Analysis, Joint Palpation, Range of Motion (ROM) Testing at The Shoulder and Adjacent Joints, Static Muscle Tests (SMT's), Special Orthopedic Tests and Neural Testing for Physical Testing.For tele-rehab: rehab Tele rehabilitation System.
3	Pratiksha Dighe et.al in Jan 2020 [7]	RCT (n= 50)	Population: Knee OA Grade 1 & 2. Control group (n=25): Exercise in OPD. Thrice a week for 4 weeks. Experimental group(n=25): Tele-Rehab thrice weekly for 4 weeks.	Both groups showed improvement but no significant difference amongst the groups except balance and proprioception which improved more in Tele-rehabilitation group.	NPRS ROM MMT WOMAC SINGLE LEG STANCE TEST
4	Neslihan Duruturk et.al. in Dec 2019 [8]	Double Blind Randomized Controlled Trial (n=50)	Population: Patients having Type II Diabetes Mellitus and musculoskeletal disorder. Subjects were given breathing and callisthenic exercises, thrice/week for 6 weeks, at home by video conferencing.	Tele-rehabilitation interventions were safe and proved to be economical.	HbA1c 6 min walk test Muscle strength Dynamometer

5	Erdi Kayabınar et.al. in Sept 2020 [9]	RCT (n=40)	40 teachers participated in study whereas 18 took tele-rehabilitation.	Tele rehab is beneficial to population having no/limited access to conventional rehabilitation.	CMDQ ODI UEFI BAI BDI WLBS
6	M. A. Cabello et.al. in Dec 2020 [10]	RCT (n=54)	Population: Subjects with Patellofemoral pain syndrome (PFPS) (4 weeks—12 treatment sessions)	Tele rehab was effective in improving functional status and reducing pain.	Visual Analog Scale (VAS) The DN4 Neuropathic Pain Questionnaire Functional Balance—Through the Kujala Score Test Lower Extremity Functional Scale
7	Dahlia Kairy et.al. in Aug 2013 [11]	Case study (n=5)	Subjects who had undergone TKR. (8-week rehabilitation process)	Neither of the subject regarded tele-rehab as a barrier in receiving quality rehabilitation services.	Verbal interview
8	Adesola C. Odele et.al. in 2014 [12]	RCT (n=50)	Population: Subjects with Knee OA. Both the groups were given rehab thrice a week for 6 weeks.	Significant improvements were seen in psychological and physical domains of QoL.	WHOQoL-Bref
9	Michel Tousignant et.al. in June 2011 [13]	RCT (n=48)	Subjects receiving TKR. (Control group n= 24	Both groups were satisfied with the services. Moreover, the physiotherapist	Healthcare Satisfaction Questionnaire

			Experimental group n=24)	giving intervention was more satisfied with respect to achieving goals, patient–therapist relationship, and quality and prognosis of tele-rehab.	
10	Julia Miller et.al. in July 2009 [14]	RCT (n=385)	Patients with musculoskeletal/ orthopedic conditions. (a) Videotape Featuring the Treating Physiotherapist (B) Videotape Featuring an Unknown Physiotherapist (C) Face-To-Face Consultation with The Physiotherapist (Control Group). (Duration Of Study = 4-6 Weeks)	Patients in the videotape groups were prescribed more exercises and were more skilled in performing them than were the face-to-face group. However, in terms of clinical progress, instruction by videotape was no more effective than face-to-face. Videotaped instruction proved popular and appeared to help motivate patients to continue self-treatment but produced no detectable saving in physiotherapist time in consultation.	1. Clinical progress of the condition; 2. Changes in well-being/disability; 3. Physiotherapist contact time; 4. Patients' experience and perceptions of videotaped instruction; and 5. Level of patients' self-treatment skills
11	Bradley R Richardson in March 2016 [15]	Repeated measure design study (n=18)	Population: Subjects with Knee Pain (n=18) who underwent traditional as well as telerehabilitation.	67% of cases had exact agreement w.r.t. pathoanatomic assessment and were similar in 89% of cases.	Self-palpation Self-applied modified Orthopedic tests Active movements and functional tasks.

12	Ji Hui Neo et.al. in Dec 2019 [16]	Case study (n=1)	43-year-old patient with frozen shoulder.(duration = 9 weeks)	Telerehabilitation is beneficial in treating frozen shoulder.	ROM
13	Hélène Moffet et.al. in Feb 2017 [17]	RCT (n=205)	Patients undergone TKA.(Both control and experimental groups were given same regime but mode of application was different)	The satisfaction level of both the groups did not differ and was highly significant (over 85%).	Participants were assessed at baseline (before TKA), at hospital discharge, and at 2- and 4-months post discharge (E4) using functional outcomes.
14	Trevor G. Russell et.al. in Aug 2010 [18]	Repeated measure design study (n=15)	Patients with chronic ankle pain and disability.	93.3% similar agreement & 80% exact agreement in patho-anatomic cases.	A digital assessment system.
15	Trevor Russell et.al. in June 2010 [19]	Repeated measure design study (n=19)	Patients with existing lower-limb musculoskeletal conditions (not related to joints) (Duration of study= 1 month)	There was 79% or higher primary diagnosis agreement (same or similar diagnoses) and 79% or higher exact systems diagnosis agreement for validity, intrarater reliability, and interrater reliability studies.	Video recordings
16	Kamran Azma et.al. in Aug 2017 [20]	RCT (n=54)	Population: Subjects with OA Knee (Duration = 6 weeks)	Both the groups showed improvement but no differences in between the groups.	KOOS WOMAC
17	Stacey L Grona et.al. in April 2017 [21]	Systemic review (Randomized controlled trials, pre-experimental studies, and	Population: Subjects with chronic musculoskeletal pain. (Age group 18-80)	Validity and reliability studies were identified as having high risk of bias. Intervention studies were of moderate quality.	Quality analysis was performed utilizing standardized tools specific for the study designs.

		case-control studies were included) n=4			
18	Suresh Mani et.al. in March 2016 [22]	Systemic review (n=4)	Patients with musculoskeletal conditions.	The physiotherapy assessments such as pain, swelling, range of motion, muscle strength, balance, gait and functional assessment demonstrated good concurrent validity. However, lumbar spine posture, special orthopedic tests, neurodynamic tests and scar assessments ranged from low to moderate.	QAREL QUADAS

Discussion

A total of rehabilitation-based 18 Researches were taken into study related to Tele-Rehabilitation and Musculoskeletal disorders. 15 studies presented the increased acceptance and better results of Tele - Physiotherapy. Pratiksha Dighe found increased balance and proprioception in tele-rehabilitation group. [7] Michel Tousignant stated that therapist satisfaction was also found to be higher in tele-rehabilitation intervention. [13] However, Julia Miller in her study stated that Tele-Rehabilitation wasn't a time saver for therapist. [14] Validity was found to be conflicting as some researchers suggested good validity but some suggested low to moderate validity. [4,15,17,18,21] However, both intra-rater and inter-rater reliability was found to be high. Stacey L Grona in her study highlighted that there might be a high risk of bias in validity and reliability studies. [20] Most studies showed tele-rehabilitation to be safe & effective. However, 3 studies portrait certain limitations in assessment of lumbar spine posture, orthopedic special test, neurodynamic test and scar assessment. [4, 20, 21] Decreased need of transportation and reduced cost leads to improved access to services for larger population especially remote areas. Erdi Kayabınar also stated that Tele-Rehabilitation is valuable for people having limited to no access to face-to-face physiotherapy. [7]

Conclusion

Since Covid pandemic has hit the world there have been a substantial increase in healthcare system's capacity to deliver physiotherapy services at a distance using Tele-Rehabilitation. But at the same time, it has occurred that "hands-on" Physiotherapy technique have become less important for some health conditions. Various researches have shown that the impact of a good exercise therapy regime has similar effect as a clinical session in in OPD.

Telerehabilitation has also decreased the use of electrotherapy for routine treatments whereas exercise therapy has seen a rise as an important component of care. Tele-Rehabilitation based physiotherapy was found to be more feasible with good validity and reliability but in certain areas orthopedic specialized test and treatments require face to face or in clinics mode of operation. Majority of articles depicted that Tele-Rehabilitation might be the future of Rehabilitation but in country like India, providing quality services in rural areas will still remain a bigger challenge.

Conflict of interest

Nil

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