

# **Telerehabilitation**

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## **Summary**

One possibility to improve access to and quality of rehabilitation on the primary, secondary and tertiary level is telerehabilitation. It enables rehabilitation through modern information and communication technologies at the patient's home. The article provides a review of the literature on telerehabilitation and presents the potentials for its use.

## **Introduction**

Disability level (activity limitations and participation restrictions) is estimated as 10% in most European countries and is increasing with population aging (1-3). Problems that arise from various disabilities, including mobility limitations, can be successfully reduced or solved with comprehensive rehabilitation (1). Rehabilitation should begin immediately after the reduced capability or injuries occur and end with a successful return to the home environment. A lack of rehabilitation will, for most, reduce the eventual level of independence and quality of life (4).

Many patients do not receive adequate rehabilitation or their rehabilitation program does not start early enough. Reasons may be lack of resources,

long distances and other. One possibility to improve access to and quality of rehabilitation on the primary, secondary and tertiary level is telerehabilitation. It enables rehabilitation through modern information and communication technologies at the patient's home. The use of telerehabilitation is becoming more viable as the speed and sophistication of communication technologies improve.

The article provides a review of the literature on telerehabilitation and presents the potentials for its use.

## **Methods**

Literature search on telerehabilitation has been done.

## **Results**

Ideas about telerehabilitation are not new. Until now 375 articles have been found in Pubmed, more than half in the last five years and 86 in the last year (2015). Forty-three of them are randomised controlled trials (RCT) and 27 are systematic reviews.

Hailey et al. (5) noted that 51% of studies in their review, published in the field of telerehabilitation, reach a significant level of quality. The same percentage of the studies reported a clinically significant improvement. However, additional studies are required to prove efficiency for 62% of the telerehabilitation applications. For 23% of the cases, additional studies are only recommended (5).

Studies on telerehabilitation can be divided into studies on technical systems, new clinical approaches, and patient management (6). Several different technical systems and approaches have been used in those studies, such as pedometers, inertial sensors, accelerometers, robots, virtual reality and others (7).

Clinical studies can be divided into studies on tele-assessment, tele-therapy, satisfaction of included people and cost effectiveness. Telerehabilitation has been used in elderly, patients with musculoskeletal problems, internal and several neurological diseases by almost all members of rehabilitation team – doctors, physiotherapists, occupational therapists and speech and language therapists. They also find that it is cost effective for both the health insurance company and patients (including travel costs) (8).

## **Elderly**

Advanced age is not a barrier for telerehabilitation. In the study of Crotty et al. (9) participants felt that they had achieved 75% of the goals set at the beginning of the programme. There was also a 50% reduction in home visits by staff, or 10 visits per patient (9).

## **Patients after orthopaedic surgery**

Telerehabilitation is effective for recovery of motor function for patients following orthopaedic surgery, especially total knee replacement and cardiac patients (10). In-home telerehabilitation enables increased intensity and seems to be a promising alternative to traditional face-to-face treatments of these patients (11). The cost for a single session of in-home telerehabilitation compared to conventional home-visit rehabilitation was lower or about the same, depending on the distance between the patient's home and health care center. Under the controlled conditions of an RCT, a favorable cost differential was observed when the patient was more than 30 km from the provider – post-knee arthroplasty (12).

## **Amputees**

For amputee services, Rinata reported successful use of telerehabilitation for wound assessment in patients following lower limb amputation (13). High patient satisfaction scores and successful implementation of telerehabilitation for amputee-related applications were also reported by Linassi (14), Lemaire (15-17), and Kosasih (18).

## **Stroke patients**

In the last systematic review and meta-analysis on stroke patients Chen et al. (19) found that there is limited, moderate evidence that telerehabilitation of all approaches has equal effects with conventional rehabilitation in improving abilities of activities of daily living and motor function for stroke survivors. Further research of RCTs in this area (rehabilitation field of telemedicine) is urgently required to extend the evidence (19). Linder et al. (20) in a RCT found that using a telerehabilitation model may be valuable approaches to improving quality of life and depression in people after stroke. Studies on stroke patients also show promising results in supporting caregivers, about the quality of the evidence low (21). This is different from the results of the Cochrane review published two years ago (22).

### **Patients with multiple sclerosis**

There are two systematic reviews on telerehabilitation of persons with multiple sclerosis (MS) (23, 24). Their conclusions are similar. There is low-level evidence for reduction in short-term disability (and symptoms) such as fatigue and also supporting telerehabilitation in the longer term for improved functional activities, impairments (such as fatigue, pain, insomnia), and participation. There were limited data on process evaluation (participants'/ therapists' satisfaction) and no data available for cost effectiveness. There were no adverse effects reported as a result of telerehabilitation intervention (23, 24).

### **Patients with spinal cord injury**

For patients with spinal cord injury there is some evidence that telecounselling can significantly improve an individual's management of common comorbidities following spinal cord injury, including pain and sleep difficulties (25, 26). Medium-term treatment effects were difficult to evaluate, with very few studies providing these data, although participants have reported gains in quality of life 12 months after treatment (25). The main clinical advantages are time efficiency and consumer satisfaction (25).

### **Speech and language therapy**

Speech and language therapists used telerehabilitation for assessment and interventions of speech, language, voice, swallowing, and some others areas. Most (85.5%) of the studies concluded that the telerehabilitation procedure had advantages over the non-telehealth alternative approach (27).

### **Conclusion**

Telerehabilitation allows greater efficiency and shortens the duration of rehabilitation, which is limited by the finances of the national health insurance company. At the moment there is still insufficient evidence to confirm that telerehabilitation is a cost-saving or cost-effective solution, but more patients are treated in less time, clinical space limitations are solved, and new methods help health professionals manage work overload. Faster and prolonged rehabilitation also enables faster return to work and reduces the cost of health insurance.

## Izjava o sukobu interesa

Autori izjavljuju da nemaju sukob interesa.

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