*Review Article*

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# Telerehabilitation: Is Technology-Driven Healthcare an Effective Option for Improving Quality of Life?

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**Abstract**

Telerehabilitation (TR) refers to the delivery of rehabilitation services via information and communication technologies. Telemedicine offers an innovative approach to increase access to rehabilitation medicine services for patients who live in areas where healthcare providers are scarce or absent. The objective of this review paper was to highlight the role of TR from an evidence-informed perspective. We searched MEDLINE for English articles and identified abstracts relevant to TR which were synthesized under practice and research in TR with issues in the present and implications for future.

**Keywords:** Telemedicine; mHealth; Telephone Triage.

## Introduction

Telemedicine offers an innovative approach to increase access to rehabilitation medicine services for patients who live in areas where healthcare providers are scarce or absent. Telerehabilitation (TR) refers to the delivery of rehabilitation services via information and communication technologies. The objective of this review paper was to highlight the role of TR from an evidence-informed perspective.

We searched MEDLINE for English articles and identified abstracts relevant to TR which were synthesized under practice and research in TR with issues in the present and implications for future.

## Practice of Telerehabilitation

People with disabilities who live in rural communities face challenges accessing healthcare due to their inability to travel long distances to a specialty clinic for necessary expertise due to inadequate or unavailable transportation, disability specific limitations, and financial limitations (Parmonto and Saptono, 2009).

Telerehabilitation was used by physical therapists, occupational therapists, speech and language pathologists, audiologists, recreational therapists, neuropsychologists, nurses, other physician specialists, and physiatrists (Gregory et al, 2011). Brennan et al (2010) emphasized that TR encompasses a range of rehabilitation and habilitation services that include assessment, monitoring, prevention, intervention, supervision, education, consultation, and counseling, across many points of service, such as health care settings, clinics, homes, schools, or community-based worksites.

TR aimed at enhancing quality of life should adequately address the supposedly advantageous routine face-to-face care such as; interventions were delivered in the natural environment, efficacy through individualization of care, increasing patient participation, including environmental context in rehabilitation, and increasing patient satisfaction (McCue et al, 2010). Brennan and Barker (2008) explained the importance of human factors in developing and implementing TR programs that they should address: factors such as age, education and technology experience; accommodating a range of potential patient impairments, including deficits in language, cognition, motor function, vision and voice; adherence to universal design standards to improve accessibility, efficiency, usability and end user understandability.

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## Research in Telerehabilitation

Rogante et al (2010) aimed to describe the ten-years state-of-the-art literature by searching five databases and found 146 scientific articles of which 56 articles focused on patient treatment, 23 are reviews, 3 were to be considered as both patient treatment papers and reviews, 53 are either technical reports, system descriptions or analyses of new approaches; and 8 were general discussion on telerehabilitation.

Hailey et al (2011) searched five databases and reviewed 61 studies on twelve clinical categories of disability, other than mental health conditions, and drug or alcohol addiction and found that 51% studies were of high or good quality of which 71% studies reported that TR applications were successful, 18% unsuccessful and 11% unclear.

Evidence for telerehabilitation had grown in size by the increasing number of systematic reviews, but Rogante et al (2015) found quality-related issues in reporting systematic reviews and they found telerehabilitation was comparable to usual care: (1) in the short term treatment of mental health related to people affected by spinal cord injury; (2) in rural communities for treating patients affected by chronic conditions; (3) in treating common pathologies (mainly asthma) affecting children and adolescents.

Seelman and Hartman (2009) listed the need for future studies in TR as: (a) need for policy as a complement to technology and clinical services; (b) need for outcome studies; (c) need for innovation in health care to meet the needs of the world's burgeoning older adult and disability populations; (d) need for including medical, functional and quality of life factors into studies; and (e) need for a data base of research studies and research tools.

## Economical Impact of TR

Dhurjaty (2004) described that, "telerehabilitation had a positive business case with respect to all the stakeholders: patients benefit by getting back to their normal activities faster, both at home as well as work. Telerehabilitation at work allows employees to be treated at work without having to take time to go to a clinic. Lost opportunity costs for employers are minimized when workers return to work faster and are treated onsite. The ability to measure progress quantitatively is beneficial for patients, providers, payers, and employers. Additionally, malingering can be detected and eradicated using telerehabilitation. Proper application of appropriate telerehabilitation technologies makes eminent economical sense. There is a strong business case for the application of telerehabilitation, onsite, in large corporations and therefore is profitable to medical device manufacturers.

## Issues in Telerehabilitation

Theodorus and Russell (2008) listed as follows: "(a) licensure and certification across state and national borders; (b) equivalence of international clinical standards; (c) regulation on privacy issues and the access and protection of patient health information; (d) issues on costs and remuneration of services; (e) liability and accountability; and (f) unification of international rules effecting clinical consultations."

Kaplan and Litewka (2008), identified the following policy-related problem areas: "(a) abridgement of privacy by inducing combining and mining data and implications of new technology on informed consent; (b) inaccurate and obsolete data; (c) security breaches; (d) usability and user friendliness; (e) data standards, and integration for linking patient and personal information to achieve interoperability of individual records, personal health management and public health; (f) systems design and deployment decisions; and, (g) trade-offs between social isolation and enhanced care, especially homecare".

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