Chapter 6
New Telerehabilitation Services for the Elderly

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ABSTRACT

The world’s population is getting older with the percentage of people over 60 increasing more rapidly than any other age group. Telerehabilitation may help minimise the pressure this puts on the traditional healthcare system, but recent studies showed ease of use, usability, and accessibility as unsolved problems, especially for older people who may have little experience or confidence in using technology. Current migration towards multimodal interaction has benefits for seniors, allowing hearing and vision problems to be addressed by exploring redundancy and complementarity of modalities. This chapter presents and contextualizes work in progress in a new telerehabilitation service targeting the combined needs of the elderly to have professionally monitored exercises without leaving their homes with their

DOI: 10.4018/978-1-4666-3990-4.ch006
need regarding interaction, directly related to age-related effects on, for example, vision, hearing, and cognitive capabilities. After a brief general overview of the service, additional information on its two supporting applications are presented, including information on user interfaces. First results from a preliminary evaluation are also included.

**INTRODUCTION**

The world’s population is getting older with the percentage of people over 60 increasing more rapidly than any other age group. The World Health Organization estimates an increase of 223 percent in the number of older people between 1970 and 2025 (WHO, 2002). By 2025, it is anticipated that there will be 1.2 billion humans over the age of 60 and this will continue to rise to about 2 billion in 2050. Ageing brings a decrease in functioning associated with an increase in a variety of chronic diseases, which leads to greater use of healthcare services (WHO, 2002). This challenges the traditional healthcare system and the scarcity and cost of health resources are likely to limit the health system’s ability to appropriately respond to a population that not only wants to live longer, but to live with more autonomy and quality of life (Kairy, Lehoux, Vincent, & Visintin, 2009). One of the most common problems with elderly people is mobility. The need to attend a Health facility (e.g.: clinic) has repercussions in their daily life and that of their families.

The use of technologies in health has seen a remarkable development in recent years, bringing a new or unique terminology. If the word ‘telemedicine’ appears in the first articles in this issue, nowadays the concept of telehealth appears to be the one that best reflects the potential of this subject:

*Telehealth is the use of electronic communications to support long-distance clinical health care, patient and professional health-related education, public health and health administration (HRSA).*

With suitable natural interfaces and the possibilities offered by the next generation networks (NGNs), the introduction of technological solutions can facilitate the daily life of the elderly, fighting isolation and exclusion, increasing their pro-activity, work capacity, and autonomy.

As part of telehealth, telerehabilitation is the use of electronic communication and information technologies to provide rehabilitation at a distance. It comprises two categories: assessment (the patient’s functional abilities in his or her environment), and therapy. Teleconferencing or teleconsultation are no longer the primary services that can be distance provided. In fact, in telerehabilitation we can now include digital monitoring, patient surveillance and real time applications (Shaw, 2009). As an alternative to face-to-face rehabilitation approaches, it offers the possibility to overcome geographical barriers or act as a mechanism to extend limited resources and enhance outcomes in populations with special needs (McCue, Fairman, & Pramuka, 2010).

Telerehabilitation has been explored in several fields: neuropsychology; speech, language and hearing; occupational therapy and physical therapy. For example, Tele-audiology (hearing assessments) is a growing application.

The concern of different professionals on this topic has resulted, for example, in the American Physical Therapy Association defining guidelines for the practice of telehealth. In this document, telehealth also encompasses a variety of health care and health promotion activities, including, but not limited to, education, advice, reminders, interventions, and monitoring of interventions (APTA, 2009).

The pressure to provide quality services for an increasing population is felt in the elderly care sector. Telerehabilitation may help minimise the pressure put on the healthcare system by the continuous ageing of the worldwide population.
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