

## Telemedicine for Telerehabilitation in Areas Affected by Social Conflicts in Colombia

**Authors :** Lilia Edit Aparicio Pico, Paulo Cesar Coronado Sánchez, Roberto Ferro Escobar

**Abstract :** This paper presents the implementation of telemedicine services for physiotherapy, occupational therapy, and speech therapy rehabilitation, utilizing telebroadcasting of audiovisual content to enhance comprehensive patient recovery in rural areas of San Vicente del Caguán municipality, characterized by high levels of social conflict in Colombia. The region faces challenges such as dysfunctional problems, physical rehabilitation needs, and a high prevalence of hearing diseases, leading to neglect and substandard health services. Limited access to healthcare due to communication barriers and transportation difficulties exacerbates these issues. To address these challenges, a research initiative was undertaken to leverage information and communication technologies (ICTs) to improve healthcare quality and accessibility for this vulnerable population. The primary objective was to develop a tele-rehabilitation system to provide asynchronous online therapies and teleconsultation services for patient follow-up during the recovery process. The project comprises two components: Communication systems and human development. A technological component involving the establishment of a wireless network connecting rural centers and the development of a mobile application for video-based therapy delivery. Communications systems will be provided by a radio link that utilizes internet provided by the Colombian government, located in the municipality of San Vicente del Caguán to connect two rural centers (Pozos and Tres Esquinas) and a mobile application for managing videos for asynchronous broadcasting in sidewalks and patients' homes. This component constitutes an operational model integrating information and telecommunications technologies. The second component involves pedagogical and human development. The primary focus is on the patient, where performance indicators and the efficiency of therapy support were evaluated for the assessment and monitoring of telerehabilitation results in physical, occupational, and speech therapy. They wanted to implement a wireless network to ensure audiovisual content transmission for tele-rehabilitation, design audiovisual content for tele-rehabilitation based on services provided by the ESE Hospital San Rafael in physiotherapy, occupational therapy, and speech therapy, develop a software application for fixed and mobile devices enabling access to tele-rehabilitation audiovisual content for healthcare personnel and patients and finally to evaluate the technological solution's contribution to the ESE Hospital San Rafael community. The research comprised four phases: wireless network implementation, audiovisual content design, software application development, and evaluation of the technological solution's impact. Key findings include the successful implementation of virtual teletherapy, both synchronously and asynchronously, and the assessment of technological performance indicators, patient evolution, timeliness, acceptance, and service quality of tele-rehabilitation therapies. The study demonstrated improved service coverage, increased care supply, enhanced access to timely therapies for patients, and positive acceptance of teletherapy modalities. Additionally, the project generated new knowledge for potential replication in other regions and proposed strategies for short- and medium-term improvement of service quality and care indicators

**Keywords :** e-health, medical informatics, telemedicine, telerehabilitation, virtual therapy

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