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Posted Date: 13 December 2023

doi: 10.20944/preprints202312.0940.v1

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Optimizing Telehealth Strategies for Rehabilitation: Recommendations from Rural Physical Therapists

Jorge Luis Bustamante-Vázquez [1,2], Gaudencio Jonathan Rodrigo-Morales [1,2], Jhonatan Iván De-Dios-Pérez [1,2], Justo Artiles-Sánchez [3,4,*], Carlos Barragán-Caraballar [3,4,5,6,7], José Luís Alonso-Perez [3,4,5,6,7] and Jorge Hugo Villafañe [8,*]

[1] DULA Teleassistance Health Services, Horkest, 72530 Puebla, Mexico; jl.bustamante@horkest.com ; gj.rodrigo@horkest.com; ji.ddios@clinicastela.com
[2] Clinica Stela, Physiotherapy and Health Sciences Centre, Horkest, 72530 Puebla, Mexico; jl.bustamante@horkest.com ; gj.rodrigo@horkest.com; ji.ddios@clinicastela.com
[3] Musculoskeletal Pain and Motor Control Research Group, Faculty of Health Sciences, Universidad Europea de Canarias, C/Inocencio García 1, 38300 La Orotava, Canary Islands, Spain; jartiles71@gmail.com ; carlos.barragan@universidadeuropea.es; joseluis.alonso@universidadeuropea.es
[4] Department of Physiotherapy, Faculty of Health Sciences, Universidad Europea de Canarias, 38300 Santa Cruz de Tenerife, Spain; jartiles71@gmail.com; carlos.barragan@universidadeuropea.es; joseluis.alonso@universidadeuropea.es
[5] Musculoskeletal Pain and Motor Control Research Group, Faculty of Sport Sciences, Universidad Europea de Madrid, 28670 Madrid, Spain; carlos.barragan@universidadeuropea.es; joseluis.alonso@universidadeuropea.es
[6] Department of Physiotherapy, Faculty of Sport Sciences, Universidad Europea de Madrid, 28670 Villaviciosa de Odón, Spain; carlos.barragan@universidadeuropea.es; joseluis.alonso@universidadeuropea.es
[7] Onelifecenter, Multidisciplinary Pain Treatment Center, 28925 Madrid, Spain; joseluis.alonso@universidadeuropea.es ; carlos.barragan@universidadeuropea.es
[8] IRCCS Fondazione Don Carlo Gnocchi, Piazzale Morandi 6, 20148 Milan, MI, Italy; mail@villafane.it
* Correspondence: mail@villafane.it (J.H.V); artiles71@gmail.com (J.A.S).

Abstract: Background: To investigate the experiences and perspectives of rural physical therapists in relation to various telehealth strategies in physical therapy; Methods: A qualitative field study was conducted in [n=4,344] remote regions of [n=6] (Mexico). Using telehealth technology, 16 physical therapists from 6 clinics expanded their reach and provided physical therapy care to patients located in nonmetropolitan sites. The outcomes measured were the sociodemographic characteristics, telemedicine modalities employed, and the types of treatments administered. These assessments were conducted pre, post-intervention, and during the follow-up period; Results: This study included 4,344 participants, averaging 44.5 ±20.7 years old. Most visits (80.1%) were initial, while 19.9% were follow-ups, with an average of 12.4 ±4.7 sessions. "Puebla sur" had the highest case frequency (29.3%), followed by "Tlalnepantla" (27.5%), "CAPU" (17.4%), "Tlalpan" (15.5%), and "Guadalajara" and "Guatemala" clinics with lower frequencies (8.8% and 1.5%, respectively); Conclusions: This study highlights the potential of telemedicine to surmount barriers such as limited access to healthcare facilities, physical impediments faced by patients in rural areas, and financial burdens on families. The findings contribute to the optimization of telehealth strategies, specifically tailored to the unique challenges of rehabilitation care in underserved rural communities.

Keywords: telehealth; rehabilitation; physical therapy

1. Introduction

The increasing aging population has created a demand for e-health technologies that support healthy aging, reduce healthcare costs, and address the limited availability of healthcare professionals [1,2]. These technologies encompass various information and communication

 doi:10.20944/preprints202312.0940.v1

technologies used in healthcare settings, including remote monitoring technologies (RMTs) [3,4]. RMTs allow for the remote monitoring of individuals' health and the transmission of data to healthcare providers for review. While the potential of RMTs to improve patient care is recognized, research on their adoption in primary care settings is limited [5,6]. However, there is an understanding of the benefits that RMTs can bring to older adults, caregivers, and healthcare professionals. Primary care clinicians, in particular, can play a crucial role in monitoring and responding to RMT data, leading to improved access to care and early detection of diseases [7,8].

Rural communities in Mexico are confronted with significant healthcare disparities, particularly when it comes to accessing rehabilitation services. One specific challenge is the scarcity of physical therapists in these areas, which amplifies the difficulties faced by residents who require rehabilitation care. Consequently, the lack of access to specialized healthcare providers in these areas contributes to the disparities in physical therapy care experienced by rural communities in Mexico. Addressing these disparities is crucial to ensure equitable healthcare access and improve the well-being of individuals in rural Mexico. Additionally, telehealth, which involves the use of electronic information and telecommunications technologies to facilitate remote clinical healthcare, holds promise in extending subspecialty care to rural communities [9]. Through telehealth strategies like physician-access hotlines, remote electronic medical record access, e-consults, and live video telemedicine encounters, healthcare providers can overcome geographical barriers and deliver specialized care to patients in underserved areas.

While previous studies have investigated the feasibility and satisfaction of telehealth in the field of physical therapy, there is a critical need to delve into the experiences and preferences of rural physical therapists in utilizing telehealth strategies. Understanding their perspectives is essential for optimizing the implementation of telehealth specifically in rural areas, where unique challenges and requirements exist [10–12]. By examining the experiences and perspectives of rural physical therapists, this research aims to make a valuable contribution to the advancement of telehealth strategies specifically tailored to address the challenges and requirements of physical therapy care in underserved rural areas. The study will employ a cross-sectional investigation involving rural physical therapists to gain a comprehensive understanding of the current role of telehealth in rehabilitation care and explore its potential for effectively meeting the healthcare needs of patients in rural communities. The findings will help inform the development and implementation of evidence-based guidelines and recommendations for the utilization of telehealth in physical therapy care, ultimately improving access to specialized services for patients in rural areas. This research seeks to bridge the gap in knowledge and provide valuable insights to enhance the delivery of high-quality rehabilitation care through telehealth in rural settings.

The aim of this study is to examine the experiences and perspectives of rural physical therapists in order to contribute to the advancement of telehealth strategies tailored to the specific challenges and requirements of rehabilitation care in underserved rural areas.

2. Materials and Methods

2.1. Design

This study is a multi-method, observational study designed to enhance our understanding of health services by employing mixed-methods research [13]. By integrating qualitative and quantitative approaches, we aim to obtain a comprehensive perspective on the subject matter. The research employed a core qualitative component alongside a quantitative supplementary element. These two methodologies were applied during the treatment and medical education phases of the telehealth intervention conducted between December 2021 and June 2022. To ensure the ethical conduct of research involving human subjects, this study obtained approval from our Institutional Review Board.

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2.2. Sampling Strategy

We reviewed the list of 6 physical therapy clinics, which indicated that they provided care to patients over 18 years of age through telemedicine. From this list, we invited a purposive sample to participate. The selection was based on several factors, including geographic diversity (e.g., large rural, small rural, and isolated areas), demographic characteristics (e.g., age, gender), clinical training (e.g., physician, non-physician provider), and practice characteristics. We continued collecting data until we reached saturation, which is the point at which findings repeated or recurred across the sample.

2.3. Data sources and collection

The research project utilized two main data sources: systematic field notes and key informant interviews. The systematic field notes were taken by investigators throughout the planning and training process and captured observations about collaboration dynamics and training dynamics. Key informant interviews were conducted with hospital leaders and staff to gather insights into motivations and concerns. The interviews covered various aspects related to evidence perceptions, needs, and the clinical context.

2.4. Statistical analysis

Data analysis was performed using the SPSS software (version 28, USA). We conducted an analysis of the demographic and practice characteristics of the participants included in our study, focusing specifically on those who reported using telehealth services within the past 12 months. In order to assess the significance of variations observed among different groups, we employed chi-squared analysis. We deemed differences to be statistically significant if the corresponding P-value was less than 0.05. This threshold was chosen to establish a level of confidence in our findings and to identify meaningful distinctions within our sample population.

3. Results

3.1. Demographic and Practice Characteristics of Telehealth Users

A total of 4344 participants were included in the study. The average age of the participants was 44.5 ±20.7 years. The majority of the visits (80.1%) are first-time visits, while a smaller proportion (19.9%) consists of subsequent or follow-up visits. Regarding the number of sessions, on average, participants attended 12.4 ±4.7 sessions, (Table 1).

Table 1. Demographic characteristics.

	n	**Mean**	**SD**
Age	4344	44.5	20.7
Sessions	4344	12.4	4.5
Visit			
First	3480	80.1	
Following	864	19.9	
Total cases	4344		

Among all the clinics, "Puebla sur" stands out with the highest frequency of cases, having a total of 1273 cases, accounting for approximately 29.3% of the entire dataset. Close behind is the "Tlalnepantla" clinic with 1195 cases, making up around 27.5% of the total. "CAPU" clinic follows with 756 cases, which represent roughly 17.4% of the total cases. "Tlalpan" comes next with 673 cases, contributing approximately 15.5% to the dataset. On the other hand, "Guadalajara" and "Guatemala"

 doi:10.20944/preprints202312.0940.v1

clinics have relatively lower frequencies, with 382 cases (8.8%) and 65 cases (1.5%), respectively, (Table 2).

Table 2. The distribution of cases among different clinics.

Clinic	Frequency	Percentage
CAPU	756	17.4
Guadalajara	382	8.8
Guatemala	65	1.5
Puebla sur	1273	29.3
Tlalnepantla	1195	27.5
Tlalpan	673	15.5
Total	4344	100

4. Discussion

Among the most important aspects of the implementation of telemedicine has been and will be the reduction or elimination of barriers to its implementation [14]. The development of technology has allowed the incorporation of telemedicine all over the world, enabling certain healthcare activities to be carried out in environments that currently had greater difficulties in regular healthcare [15]. COVID-19 has pushed many healthcare institutions to use telecare in order to respond to the demands imposed by this disease. For example, in the United States in January 2020, only 24% of healthcare institutions had a telehealth system in place [16,17].

In Europe, the telemedicine market has tripled from almost 4 billion dollars to almost 13 billion dollars in 2019 alone, which is a very significant and different growth from that of other countries with less significant economic resources [18].

This increase can also be seen throughout Latin America, where both public and private health centres are increasing their telemedicine services, reducing the cost of care, reaching a greater number of people and avoiding crowds of people in health services [19].

The main objective of this research is to examine the experiences and perspectives of rural physiotherapists and their preferences regarding telehealth strategies. The findings of this study aim to contribute to the advancement of telehealth approaches that are specifically designed to meet the unique challenges and requirements of subspecialty care in underserved rural areas.

These rural areas, despite the aforementioned development of telemedicine in recent years in different countries, have a much more limited reach than in urban areas, reaching 1% of the total use of telemedicine in the United States [16]. This study includes a total of 4344 participants located in large, medium and small rural areas in Latin America, specifically in Mexico and Guatemala, allowing us to reach rural areas of greater or lesser size.

Numerous studies show the importance of speed in health care, both in primary care and specialist care, and highlight the long waiting times that many patients experience before being seen by a professional [20,21]. Jeffrey A. Quon et al. show how patients whose care is delayed because of waiting lists can have their pain scores exacerbated as opposed to receiving earlier care in patients undergoing lumbar spine surgery [22]. 80.1% of patients who received telemedicine were for a first visit, highlighting the importance of subjective patient screening in order to expedite care.

Ruth Sim et al. in a study using telemedicine for the treatment of diabetes reported patient satisfaction with the use of telemedicine due to improved patient monitoring, better access to healthcare professionals and shorter waiting times [23]. This is even more important in rural settings due to the lack of access to healthcare facilities and professionals, the physical qualities of many of the patients that complicate travel, waiting times and reduces the financial burden on families [24].

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4.1. Limitations

Our study, while contributing valuable insights, is not without its limitations that warrant consideration. Firstly, the findings may lack broad generalizability beyond the specific regions under investigation. The unique characteristics and healthcare infrastructure of these areas may markedly differ from those in other rural regions, potentially impacting the broader applicability of the study's recommendations. Secondly, the utilization of purposive sampling to construct the study's sample introduces the possibility of bias in participant selection. While this method was chosen intentionally to target specific demographics, it is important to acknowledge its potential influence on the representation of the broader population. Additionally, our study focused on telehealth interventions conducted between December 2021 and June 2022. This time frame may not fully encapsulate the latest advancements in telehealth technologies. Given the rapid pace of technological evolution, our findings may not be entirely reflective of the current landscape, and newer technologies could impact the feasibility and effectiveness of telehealth in rehabilitation care. Furthermore, the follow-up period for assessments was conducted post-intervention, providing valuable insights into short-term outcomes. However, the study did not extensively explore the long-term effects and sustainability of telehealth strategies in rural physical therapy care. This limitation restricts our comprehensive understanding of the lasting impact of the telehealth intervention.

5. Conclusions

This study highlights the potential of telemedicine to surmount barriers such as limited access to healthcare facilities, physical impediments faced by patients in rural areas, and financial burdens on families. One of the key findings emphasizes the critical role of telemedicine in addressing the time-sensitive nature of healthcare. Long waiting times, a common issue in both primary and specialist care, can be mitigated through telehealth interventions. Patient satisfaction is notably improved, as demonstrated by the positive outcomes reported in studies related to diabetes treatment and lumbar spine surgery.

Author Contributions: Conceptualization, J.L.B.V. and J.L.A.P.; methodology, G.J.R-M and J.I.P.; investigation, J.L.B.V., G.J.R-M and J.I.P.; data curation G.J.R-M and J.I.P.; writing—original draft preparation, J.L.B.V., J.L.A.P. and J.A.S.; writing—review and editing, J.H.V., C.B.C. and J.A.S.; visualization, J.H.V., C.B.C. and J.A.S.; supervision, J.L.B.V., C.B.C. and J.L.A.P; All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of IPETH Instituto Profesional en Terapias y Humanidades, Mexico (03/2022).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the patient(s) to publish this paper.

Data Availability Statement: Data available on request due to privacy and ethical restrictions.

Acknowledgments: JH Villafañe declares support and funding by the Italian Ministry of Health - Ricerca Corrente 2024.

Conflicts of Interest: The authors declare no conflict of interest.

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