Utilizing Home-Based Telerehabilitation to Improve Patient Access After Anterior Cruciate Ligament Reconstruction

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Introduction

- Disparities in Social Determinants of Health greatly influence post-operative outcomes (Solomon et al 2020 U Chicago)
  - Telehealth can improve access for patients living in rural communities
- Telehealth **rehab** apps show promise in improving functional limitations (Shi et al Chinese Academy of Medical Sciences)
- Telehealth in rural neighborhoods presents many unique challenges
  - (i.e., patient lack of technology device, poor internet connectivity, decreased patient/provider buy-in)

Research Question

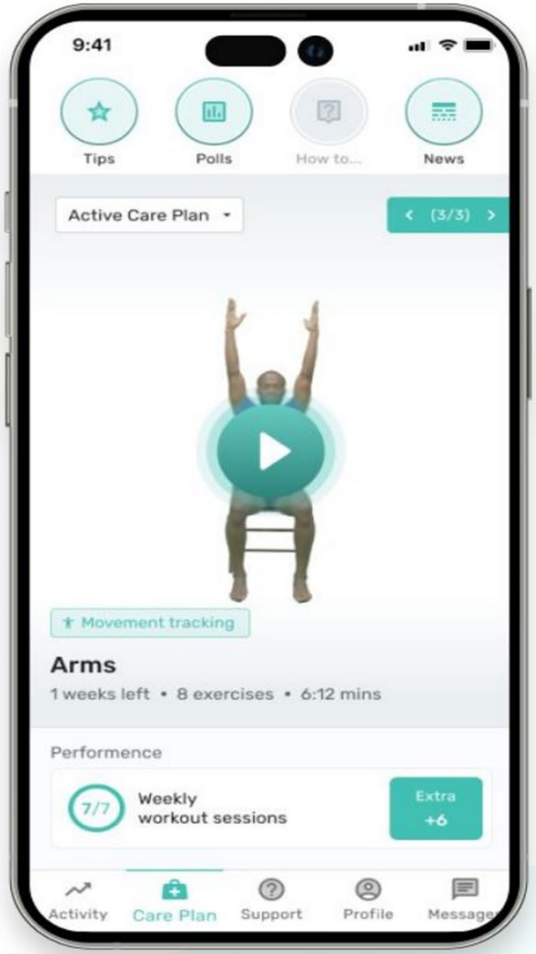
Can telerehabilitation improve patient access for individuals living in rural Mississippi communities?

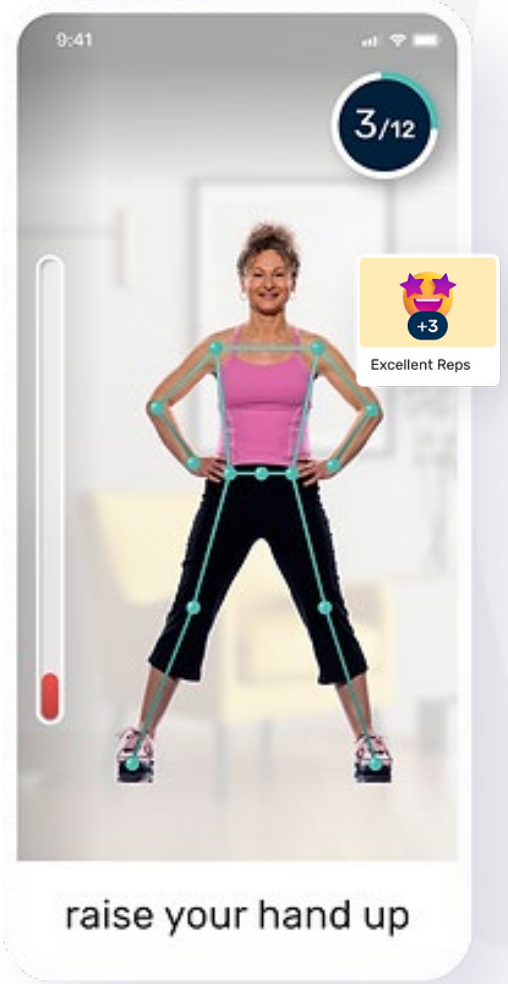
Aim

To assess the feasibility of WizeCare to increase patient access for individuals who have undergone ACL Reconstruction

WizeCare

- Created in 2019
- Phone must have mobile camera
- MoveAI™
  - HIPAA compliant
- Patient Portal and Clinician Portal





Clinical Significance

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Reviews

Effectiveness of Telerehabilitation Programs in Elderly with Hip or Knee Arthroplasty: A Systematic Review

Nawel Ouendi, PhD Student [1,2], Eugénie Avril, PhD [1], Benjamin Dervaux, Dr [2], Philippe Pudlo, Pr [1], and Laura Wallard, PhD [1]

Abstract

Background: Lower limb osteoarthritis (OA) often generates musculoskeletal pain causing functional impairment and decreasing mobility, autonomy, and quality of life. Patients with OA are commonly prescribed specific care for total hip arthroplasty or total knee arthroplasty (THA or TKA), when patients present symptoms that are refractory to nondrug treatments. Currently, when patients are discharged from orthopedic surgery, they are either referred to a rehabilitation department, or sent directly home with assistance such as remote monitoring by teleconsultation or a mobile application. In recent years, there has been an evolution in digital health and in particular telerehabilitation. To determine utility and effectiveness, the aim of this systematic review was to highlight and evaluate

Original Research

Effectiveness of In-Home, Augmented Reality–Based Telerehabilitation After Anterior Cruciate Ligament Reconstruction

A Randomized Controlled Trial

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Investigation performed at Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Republic of Korea, and Bundang Seoul National Hospital, Gyeonggi, Seoul, Republic of Korea

Background: New digital technology–based rehabilitation may be a viable option for patients after anterior cruciate ligament reconstruction (ACLR), with advantages such as easy access to treatment and learning as well as cost-effectiveness.

Purpose: To investigate the effects of an augmented reality (AR)–based, telerehabilitation system in patients after ACLR compared with a brochure-based rehabilitation program in terms of patient-reported outcomes and functional performance measures.

Study Design: Randomized controlled trial; Level of evidence, 2.

Methods: This was a multicenter, assessor-blinded study. Enrolled participants were allocated randomly to either the intervention group, who underwent AR-based telerehabilitation system, or to the control group, who underwent a brochure-based rehabilitation program with a self-log. Both groups performed the same postoperative rehabilitation exercise protocol. Subjective knee function was assessed using the International Knee Documentation Committee (IKDC) as the primary outcome; secondary outcomes were a numeric rating scale for pain, the EuroQol 5-Dimension 5-Level, isometric knee strength, range of motion, and the single-leg hop test. The intervention group also completed a satisfaction survey. Follow-up was conducted at 2, 6, 12, and 24 weeks postoperatively.

Results: A total of 28 patients were enrolled in each group; 1 patient in the control group was lost to follow-up. Patients in both groups demonstrated improvement on all outcomes over time. There were no significant between-group differences in the IKDC score from baseline to 12 weeks postoperatively. The intervention group saw a greater increase in the relative isometric strength of the quadriceps on the involved limb at 6, 12, and 24 weeks postoperatively ($P < .05$ for all). No significant group differences were observed in the remaining secondary outcomes.

Conclusion: Study findings indicated that patients who underwent AR-based telerehabilitation in the early rehabilitation phase after ACLR demonstrated similar improvements as those who followed a brochure-based rehabilitation program and had a quicker recovery of knee extensor strength.

Registration: NCT04513327 (ClinicalTrials.gov identifier).

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Feasibility Criteria

1. ≥80% of participants will have initial physical therapy visit scheduled within 1 week of enrollment
2. ≥80% of participants will complete their first physical therapy appointment within 1 week of surgery
3. Zero major adverse events will result from telehealth physical therapy services
4. Patient's will complete ≥70% of scheduled physical therapy visits***
5. ≥70% of participants will report satisfaction with telehealth services***
6. ≥90% of providers will report satisfaction with use of the application to provide rehabilitation services

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Methods

Study Design: One arm feasibility study

Patient Participants: Surgical candidates for anterior cruciate ligament reconstruction (anticipated sample n=20)

Provider participants: Physical therapists providing physical therapy services through the online application to the patient participants

Once identified as a surgical candidate, participants will receive telehealth rehabilitative services until they can be seen in person by a physical therapist of their choice.

Data Collection:

- Patient and provider post surveys
- Home program and scheduled visit compliance rate
- Healthcare information in keeping with standard of care physical therapy practices

Analysis: Feasibility criteria will be assessed to determine whether this modality improves physical therapy access for rural patients.

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References

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Questions?

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