



Effectiveness of Telerehabilitation for The Elderly to Overcome Physical Inactivity – A Review

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ABSTRACT :

Background : This review critically examines the current literature on the effectiveness of telerehabilitation to overcome physical inactivity among the elderly population. It aims to provide evidence-based insights to inform the development of individualized, technology-driven rehabilitation approaches that enhance, physical inactivity, reduce mobility impairments, and improve overall functional outcomes in this population.

Methods: A thorough search was performed in the PubMed database for articles published between 2015 and 2025, focusing on the effectiveness of telerehabilitation to overcome physical inactivity among the elderly population.

Results : Based on six RCTs, telerehabilitation effectively reduces physical inactivity in elderly individuals, improving mobility, balance, muscle strength, and quality of life. It shows outcomes comparable to traditional therapy while offering greater accessibility. However, digital literacy, adherence, and limited long-term evidence remain challenges, highlighting the need for tailored, sustainable programs.

Conclusion: Telerehabilitation is an effective, accessible, and convenient approach to reduce physical inactivity among the elderly. It improves mobility, balance, and overall health, offering outcomes comparable to conventional therapy. Despite its advantages, challenges like digital literacy, adherence, and limited evidence persist. Future research should develop sustainable, tailored programs for elderly care.

Keywords: Telerehabilitation, telemedicine, virtual rehabilitation, geriatrics, physical health.

Introduction :

Telerehabilitation refers to as the interventions to improve the psychological and physical functioning of individuals using various technologies and telecommunication strategies to both provide activities and monitor their progress and safety from a distance.²⁴ Various home-based fall prevention RCTs have been published in the last 2 years, although findings were heterogenous ranging from fewer falls,²⁵ and fractures²⁶ to no significant differences in falls,²⁷ Hospitalizations or mortality²⁶ compared with usual care, which typically consisted of routine medical care²⁷ and advice on falls prevention and physical activity.²⁸ Exploring the factors that may have contributed to the heterogeneity in efficacy, such as participant comorbidities (Eg, dementia, frailty and chronic pain) and study design (Eg, amount of technological and caregiver support required for successful implementation), is needed.

Physical inactivity, according to World Health Organization (WHO), refers to as failure to accumulate at least 150 minutes of moderate physical activity or 75 minutes of vigorous physical activity or the combination of both intensities per week¹ Globally, physical inactivity is the fourth greatest risk factor for mortality, attributed to approximately four to five million deaths that could have been prevented.²

Telerehabilitation has been widely used in the treatment of various diseases and health conditions, such as heart attacks, brain injuries, spinal cord injuries, multiple sclerosis (MS), dysphagia, auditory and mental disorders,⁷ and several criteria have been examined in different studies to demonstrate the effectiveness of this type of services. For example, telerehabilitation was found effective for patients with MS, as it improved quality of life and functional activities and reduced long-term symptoms and psychological consequences. Similarly, it assisted patients with cancer to improve their clinical outcomes and reduce depression.⁸ In stroke patients, telerehabilitation helped to improve their ability to do daily works and has reduced the costs and duration of rehabilitation programs.⁹ It is an attractive option for older adults who may have multiple comorbidities and challenges in commuting to clinician's offices.

Strategies to improve transition of care can include telehealth to enhance communication and education of the patient and family caregivers¹⁰ to ensure that there are no gaps in information sharing and understanding. It is a rapidly developing discipline that has become a key part of telemedicine and e-health¹¹. It covers the scope of therapeutic intervention, management of disease, coordination of care, caregiver training and education, patient networking and consultation by multidisciplinary professionals. Therefore, the study aims at telerehabilitation services for the elderly to overcome physical inactivity.

Materials and Methods :

Study design: Literature review

Study setting: St Johns Medical College, Bangalore

Study criteria :

Inclusion criteria:

- *Randomized control trials.
- *Full text articles published in English only.
- *Time line=2015-2025.
- *Article available online at free of cost.

Exclusion criteria:

- *Duplicate articles
- *Article with poor quality. (CASP, Pedro, JBI<7)

Search strategy

A web-based search for studies from 2015-2025 was conducted in databases PubMed in which randomized control trial is included. . For further relevant studies, we manually reviewed references from the collections. To decide whether the studies met the predetermined inclusion requirements, we checked authors, titles, and abstracts. The following keywords were used, “telerehabilitation”, “telemedicine”, “virtual rehabilitation”, “geriatrics”, “physical health”.

REVIEW OF LITERATURE :

1.Sadeghi et al. (2021)¹

The study examined traditional, virtual reality, and combined balance training in 64 older men over eight weeks. All interventions improved muscle strength, balance, and mobility versus controls, with the combined approach showing the greatest gains, highlighting its effectiveness in reducing fall risk in community-dwelling older adults.

2. Ge et al. (2024)²

The study compared home physical therapy (HPT) with telerehabilitation (TR) in mild-to-moderate Parkinson’s disease patients. Both improved motor function, balance, and quality of life, but HPT showed greater benefits and adherence in older adults. Findings support safe, effective home-based interventions, emphasizing therapist-led care for improved outcomes.

3. Christiansen et al. (2024)³

The study evaluated a telehealth-based Physical Activity Behavior Change intervention versus health education in veterans post-TKA. Ten telerehabilitation sessions over 12 weeks increased step counts at 14 weeks (931 steps/day, $p=.024$) but not at 38 weeks. Both groups improved similarly in secondary outcomes, highlighting telehealth’s potential to boost activity.

4. Zhang et al. (2025)⁴

The author compared a 4-week mobile app-based telerehabilitation program with in-person resistance training for older adults with sarcopenia. Both improved strength, balance, and self-care with no significant group differences, confirming telerehabilitation’s noninferiority. Findings reinforce resistance training’s benefits and support digital health solutions for limited-access populations.

5. Eftekhari et al. (2024)⁵

The author tested a 6-week telerehabilitation program combining respiratory and corrective exercises for elderly individuals with thoracic hyperkyphosis. Significant improvements were observed in posture, chest expansion, and quality of life, though physical ability changes were minimal. The study underscores telerehabilitation’s feasibility and effectiveness for older adults.

6. *Platts-Mills et al. (2018)*⁶

The study piloted a three-arm RCT for older ED patients with musculoskeletal pain, testing usual care, video education, and video plus telecare follow-up. The combined intervention yielded the greatest pain reduction, fewer side effects, and better function, highlighting education and structured follow-up's potential to improve outcomes.

RESULTS :

The review analyzed 225 studies on telerehabilitation for elderly individuals to address physical inactivity, narrowing them to six high-quality randomized controlled trials (JBI ≥ 7) published between 2015 and 2025. These studies demonstrated telerehabilitation's effectiveness in improving muscle strength, balance, mobility, posture, pain management, and quality of life across diverse conditions such as Parkinson's disease, sarcopenia, thoracic hyperkyphosis, and post-operative recovery. Several interventions, including mobile app programs, virtual reality, and video-assisted care with telefollow-ups, showed comparable or superior outcomes to traditional rehabilitation. Findings highlight telerehabilitation's feasibility, accessibility, and potential for broader implementation, though challenges like adherence, digital literacy, and long-term impact remain underexplored.

DISCUSSION :

Strengths: Telerehabilitation offers a highly accessible and scalable solution for elderly individuals who may struggle with transportation or mobility limitations. Studies demonstrate its comparable effectiveness to traditional in-person therapy in improving muscle strength, balance, gait, and quality of life in conditions such as Parkinson's disease, sarcopenia, and post-operative recovery.¹ It also enables personalized programs and remote monitoring, ensuring continuity of care and adherence, particularly important in fall prevention and chronic musculoskeletal conditions.²

Weaknesses: Despite its benefits, telerehabilitation depends heavily on digital literacy, internet access, and device availability, which can be barriers for some elderly individuals.⁴ Lower adherence rates and reduced effectiveness were noted in older populations compared to home physical therapy (HPT), particularly where face-to-face interaction was limited. Additionally, technical issues and the inability to perform comprehensive physical evaluations remotely may compromise the therapeutic impact.⁵

Opportunities: With the aging global population and increasing prevalence of physical inactivity-related conditions like sarcopenia, Parkinson's disease, and osteoarthritis, the demand for flexible, home-based solutions is growing.³ Integration of AI-guided platforms, wearables, and interactive apps could enhance patient engagement and long-term outcomes. Moreover, telerehabilitation can extend professional services to rural or underserved communities where healthcare access is limited.⁵

Threats: Regulatory challenges, privacy concerns, and lack of standardized protocols may hinder widespread adoption. Furthermore, variability in patient engagement, especially in cognitively or technologically impaired individuals, poses a threat to the effectiveness and safety of unsupervised sessions. There's also the risk that over-reliance on digital health could unintentionally widen the gap for elderly individuals who are less tech-savvy.⁶

CONCLUSION :

This review concludes that telerehabilitation is an effective and feasible approach to reducing physical inactivity and improving functional outcomes in elderly populations. The included studies demonstrate significant benefits in muscle strength, balance, posture, pain management, and quality of life, with outcomes comparable to or exceeding traditional in-person rehabilitation. Telerehabilitation offers accessible and cost-effective care, particularly for individuals with mobility challenges or limited access to healthcare facilities. Its integration into rehabilitation programs can enhance continuity of care and patient engagement. However, barriers such as digital literacy, adherence, and lack of standardized protocols highlight the need for further research on long-term effectiveness and scalability.

CONFLICT OF INTEREST :

The authors declare no conflict of interest related to this study.

ACKNOWLEDGEMENT

The authors express gratitude to St. John's Medical College for their support and resources in conducting this review. Special thanks to colleagues and researchers whose work contributed to this study.

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