Brazilian
JOURNAL OF HEALTH AROMATHERAPY AND ESSENTIAL OIL

Review

Home-Based Physiotherapy for Older Adults: An Evidence-Based Review of Effectiveness, Functional Outcomes, and Health System Implications

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Abstract: This evidence-based review, supported by a systematic literature search, examines the scientific evidence on home-based physiotherapy for older adults, focusing on clinical effectiveness, functional impact, and implications for health systems. The analysis included 30 high-relevance studies published between 2016 and 2026, comprising randomized controlled trials, systematic reviews, and meta-analyses. The findings demonstrate that home-based physiotherapy programs, including telerehabilitation modalities, are effective in improving functional mobility, reducing falls, decreasing hospitalizations, and enhancing quality of life across diverse older populations. These populations include post-stroke patients, frail older adults, individuals with chronic obstructive pulmonary disease (COPD) and heart failure, as well as those undergoing post-surgical recovery. Evidence indicates that home-based physiotherapy interventions are cost-effective and can significantly reduce health service utilization, with estimated savings ranging from USD 123,500 to USD 1.6 million for every 100 older adults at high risk of falls. Telerehabilitation emerges as a particularly promising modality, demonstrating non-inferiority or superiority compared with traditional in-person rehabilitation, alongside high patient satisfaction and strong potential for scalability within health systems.

Keywords: Home-based physiotherapy, Geriatric rehabilitation, Functional mobility, Fall prevention, Telerehabilitation, Aging in place, Health services utilization, Cost-effectiveness, Multidisciplinary rehabilitation.

Citation: Balog RTR. Home-Based Physiotherapy for Older Adults: An Evidence-Based Review of Effectiveness, Functional Outcomes, and Health System Implications. Brazilian Journal of Aromatherapy and Essential Oil. 2026;3: bjhae02.

doi: https://doi.org/10.62435/2965-7253.bjhae.2026.bjhae2

Received: 30 January 2026
Accepted: 05 February 2026
Published: 15 February 2026

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1. Introduction

Population aging represents one of the most significant challenges for contemporary health systems worldwide. As life expectancy increases, so does the prevalence of chronic diseases, frailty, and functional decline among older adults, leading to growing demand for rehabilitation services and long-term care. Home-based physiotherapy has emerged as a promising strategy to address these demands by delivering individualized, goal-oriented care within the patient's own living environment, potentially improving clinical outcomes while reducing healthcare costs [1,2].

Over the last decade, increasing scientific attention has been directed toward home-based physiotherapy interventions targeting diverse older populations, including frail individuals, post-stroke patients, those with chronic obstructive pulmonary disease (COPD), individuals with heart failure, and older adults recovering from major orthopedic surgery [1,4,9,11,15]. In parallel, technological advances have enabled the expansion of telerehabilitation, improving access to rehabilitation services and offering viable alternatives to conventional in-person care [12,19,20].

This evidence-based narrative review synthesizes the most recent evidence published between 2016 and 2026 on the effectiveness of home-based physiotherapy in older adults, with a specific focus on: (1) clinical effectiveness across target populations; (2) functional outcomes assessed using validated instruments; (3) impacts on healthcare utilization; and (4) economic and implementation implications for health systems.

2. Theoretical Background and Context

Home-based physiotherapy is grounded in established principles of geriatric rehabilitation, neuroplasticity, functional conditioning, and prevention of disability. Delivering care in the home environment allows interventions to be tailored to real-life functional demands, reduces barriers related to transportation, and may enhance adherence and long-term engagement [18].

Participation in meaningful life roles is a core dimension of health, and home-based rehabilitation aligns with this paradigm. Frailty, defined as a multidimensional syndrome characterized by reduced physiological reserve and increased vulnerability to stressors, has become central to identifying older adults most likely to benefit from preventive and rehabilitative strategies [5,9].

For chronic conditions such as chronic obstructive pulmonary disease (COPD) and heart failure, home-based physiotherapy enables supervised exercise training and self-management education—key components of disease management [1,13]. In post-stroke populations, continuity of rehabilitation following discharge is critical to maximize recovery and prevent secondary complications, particularly falls [11].

Telerehabilitation represents a major evolution in service delivery, enabling remote supervision of exercises, monitoring of clinical parameters, and sustained therapeutic engagement without the need for physical travel. Its relevance increased substantially during and after the COVID-19 pandemic, with growing evidence supporting feasibility, safety, and effectiveness [12,16,19,20].

3. Methods (Studies Reviewed)

This study was designed as an evidence-based narrative review supported by a systematic literature search. A structured search was conducted across multiple databases, including PubMed, Google Scholar, SciSpace, and ArXiv, to identify relevant studies published between 2016 and 2026. After deduplication and relevance-based screening, 284 unique records were identified. From these, 30 studies of high methodological relevance were included for narrative synthesis, comprising randomized controlled trials (RCTs), feasibility studies, study protocols, systematic reviews, and meta-analyses.

Studies were screened based on relevance to the research objectives, target population (older adults), intervention setting (home-based physiotherapy), and reported clinical, functional, or health system outcomes. Most included studies employed parallel-group RCT designs comparing home-based physiotherapy with usual care or alternative rehabilitation approaches. Sample sizes ranged from 21 to 300 participants, with mean participant age generally exceeding 70 years. Intervention duration varied from 4 weeks to 12 months, with extended follow-up periods reported in selected studies.

Due to heterogeneity in study designs, intervention modalities, and outcome measures, findings were synthesized narratively rather than quantitatively. The evidence was thematically analyzed and organized according to target populations, intervention modalities, functional outcomes, and implications for health systems. Primary outcomes included functional mobility (Short Physical Performance Battery [SPPB], Timed Up and Go [TUG]), balance (Berg Balance Scale, BESTest), exercise capacity (6-minute walk test), functional independence (Barthel Index, Functional Independence Measure), incidence of falls, quality of life (SF-36, SF-12, Minnesota Living with Heart

Failure Questionnaire), and healthcare utilization indicators such as hospitalizations and institutionalization [1,2,4,12].

4. Results: Clinical Effectiveness by Population

4.1 Frail Older Adults

Frailty is associated with adverse outcomes such as falls, hospitalization, institutionalization, and mortality. Multiple studies indicate that home-based physiotherapy programs can be effective in frail populations. The HERO (Home-based Extended Rehabilitation for Older People) program investigated a 24-week home-based exercise intervention for older adults with frailty following hospital discharge [5]. The HOPE program, delivered by National Health Service physiotherapy teams, used health-related quality of life (SF-36 physical component) as the primary outcome and included comprehensive health economic and process evaluations to assess scalability [5].

Soukkio et al. described the HIPFRA trial protocol, a randomized controlled trial that will recruit 300 older adults with signs of frailty and 300 with a recent hip fracture. The intervention consists of 12 months of home-based physiotherapy, with the primary outcome being time living at home at 24 months. The trial aims to determine whether prolonged home-based physiotherapy can delay institutionalization and reduce social and health service costs [9]. A systematic review by Alves et al. reported positive gains in independence, mobility, balance, strength, and flexibility, along with healthier lifestyle adoption and reduced frailty levels, without increasing health and social care costs [23].

4.2 Post-Stroke Patients

Post-stroke individuals require continuity of rehabilitation following discharge and are at increased risk of falls and mobility limitations. Ng et al. identified predictors of falls and long-term mobility outcomes in post-stroke patients returning home after rehabilitation. Measures including fall risk assessment (FROP-Com), physical activity levels, and dual-task Timed Up and Go (TUG) performance during rehabilitation helped identify patients at higher risk of falls and mobility limitations at 12 months [11]. The authors recommended targeting these domains during inpatient and outpatient rehabilitation to optimize long-term functional outcomes [11].

Park et al. conducted a systematic review of interactive telerehabilitation with remote monitoring and guidance for balance and gait performance in older adults and individuals with neurological conditions, including stroke. Across 17 studies, consistent improvements in balance and gait were reported following at least four weeks of interactive telerehabilitation delivered via virtual reality platforms, smartphone or tablet applications, or videoconferencing technologies [16].

4.3 Patients with COPD

Chronic obstructive pulmonary disease (COPD) is highly prevalent among older adults and is associated with functional limitation, increased fall risk, and frequent hospitalizations. Beauchamp et al. evaluated the feasibility of a six-month home-based fall prevention exercise program among 36 older adults with COPD who were at risk of falls. The intervention resulted in significant improvements in balance outcomes related to fall risk, including Berg Balance Scale and BESTest scores ($p = 0.001$). Exercise adherence met predefined feasibility criteria; however, recruitment and retention rates were below target, indicating the need for further refinement prior to large-scale clinical trials [13].

4.4 Patients with Heart Failure

Older adults with heart failure often present significant functional impairment and a high risk of hospital readmission. Bernocchi et al. conducted a multicenter randomized controlled trial evaluating an integrated home-based telerehabilitation program

(Telerehab-HBP) delivered over four months in 112 older patients (mean age 70 years) with chronic obstructive pulmonary disease and concomitant heart failure. The intervention group demonstrated a significant improvement in exercise tolerance, with an additional 60 meters achieved on the 6-minute walk test compared with baseline ($p = 0.004$), whereas the control group showed no significant improvement. Median time to hospitalization or death was longer in the intervention group than in controls ($p = 0.048$), and improvements in dyspnea, physical activity, disability, and quality of life were sustained at six-month follow-up [1].

4.5 Post-Surgical Recovery (Hip Fracture and Arthroplasty)

Postoperative recovery following hip fracture or total hip arthroplasty requires intensive rehabilitation to restore mobility and prevent complications. Ortiz-Piña et al. compared telerehabilitation with standard in-person home-based rehabilitation after hip fracture. The telerehabilitation group demonstrated higher Functional Independence Measure scores, with a large effect size, and better Timed Up and Go (TUG) performance compared with controls, supporting telerehabilitation as a valuable option for functional recovery [4].

Dajpratham et al. evaluated real-time teleresistance exercise following hip fracture surgery and reported significant improvements in Short Physical Performance Battery (SPPB) scores compared with traditional exercise booklet-based programs, with gains exceeding the minimal clinically important difference [14]. Zhou et al. conducted a noninferiority randomized controlled trial comparing mobile-based in-home telerehabilitation with in-hospital face-to-face rehabilitation after total hip arthroplasty, demonstrating clinical noninferiority across primary and secondary outcomes, including the Hip disability and Osteoarthritis Outcome Score [15].

Min et al. published a clinical practice guideline recommending multidisciplinary rehabilitation, progressive resistance training, and balance training, all associated with improvements in gait, physical function, strength, and balance, as well as reductions in falls. Early ambulation, weight-bearing exercises, activities of daily living training, community-based rehabilitation, and nutritional support were also recommended [7].

5. Comparative Analysis of Interventions

5.1 Exercise Programs and Balance Training

Structured exercise programs and balance training represent core components of home-based physiotherapy, with consistent evidence supporting reductions in falls and improvements in functional outcomes. Arena et al. evaluated the HOP-UP-PT program in 144 older adults at risk of functional decline or falls. The intervention reduced falls eightfold in moderate- to high-risk participants compared with controls at seven months (6.3% vs 47.8%; $p = 0.01$) and significantly improved Timed Up and Go (TUG), Four-Stage Balance Test, and modified Short Physical Performance Battery (SPPB) scores at three months [2].

Tomita et al. evaluated the Buffalo Functional Exercise (BFE) program in older adults at medium-to-high fall risk. Although both intervention and control groups improved SPPB scores, only the BFE group demonstrated improvements in balance confidence and instrumental activities of daily living, and no falls were reported in the BFE group after six weeks [3]. Bernocchi et al. reported the feasibility and clinical efficacy of a multidisciplinary home-telehealth fall prevention program incorporating Otago exercises [21].

Beauchamp et al. conducted a systematic review and meta-analysis examining whether exercise interventions improve participation in life roles in older adults. While overall effects were not statistically significant, interventions lasting 12 months or longer

demonstrated a small positive effect, suggesting that longer intervention duration may be required to influence broader participation outcomes [18].

5.2 Telerehabilitation vs In-Person Rehabilitation

Telerehabilitation has emerged as a promising modality, with multiple studies demonstrating noninferiority and, in some cases, superiority versus in-person rehabilitation. The TOP-UP program was evaluated in a hybrid type 1 effectiveness-implementation RCT involving older adults receiving aged care in Australia. TOP-UP improved mobility, sit-to-stand performance, and quality of life; reduced pain; and reduced the proportion of participants experiencing falls, with high endorsement and no serious adverse events [12].

Edward et al. supported the effectiveness of physiotherapist-led telerehabilitation for older adults with chronic conditions through systematic review and meta-analysis [19]. Bedra et al. reported feasibility and improvements in mobility, quality of life, patient satisfaction, and exercise self-efficacy following post-acute hip fracture telerehabilitation [8].

5.3 Multidisciplinary Rehabilitation

Telerehabilitation has emerged as a promising modality, with multiple studies demonstrating noninferiority and, in some cases, superiority compared with conventional in-person rehabilitation. The Telephysiotherapy for Older People (TOP-UP) program was evaluated in a hybrid type 1 effectiveness–implementation randomized controlled trial involving older adults receiving aged care services in Australia. The TOP-UP intervention resulted in improvements in mobility, sit-to-stand performance, and quality of life, reductions in pain, and a lower proportion of participants experiencing falls, with high participant endorsement and no serious adverse events reported [12].

Edward et al. supported the effectiveness of physiotherapist-led telerehabilitation for older adults with chronic conditions through a systematic review and meta-analysis [19]. Bedra et al. reported the feasibility of post-acute hip fracture telerehabilitation, along with improvements in mobility, quality of life, patient satisfaction, and exercise self-efficacy [8].

6. Functional and Clinical Outcomes

6.1 Functional Mobility and Independence

Functional mobility outcomes, including the Short Physical Performance Battery (SPPB), Timed Up and Go (TUG), and walking tests, improved consistently across studies. The TOP-UP trial reported clinically meaningful improvements in SPPB scores among older adults receiving telerehabilitation [12]. Dajpratham et al. observed improvements exceeding the minimal clinically important difference following real-time teleresistance exercise after hip fracture surgery [14]. Bernocchi et al. reported a 60-meter improvement in the 6-minute walk test among patients with chronic obstructive pulmonary disease and heart failure following home-based telerehabilitation [1].

With respect to functional independence, telerehabilitation delivered after hip fracture was associated with significantly higher Functional Independence Measure scores, with a large effect size, compared with usual care [4].

6.2 Fall Prevention

Fall prevention is a major public health priority, given the morbidity, mortality, and healthcare costs associated with falls among older adults. The HOP-UP-PT program reduced falls eightfold among moderate- to high-risk participants [2], while the TOP-UP intervention reduced the proportion of individuals experiencing falls [12]. In populations

with chronic obstructive pulmonary disease, home-based exercise programs improved balance measures associated with fall risk [13]. Multidisciplinary home-telehealth interventions incorporating Otago exercises also demonstrated reductions in falls and improvements in mobility [21].

6.3 Quality of Life

Improvements in quality of life were reported across multiple studies included in this review. The Telephysiotherapy for Older People (TOP-UP) program demonstrated significant increases in overall quality of life scores among older adults receiving telerehabilitation [12]. In populations with chronic obstructive pulmonary disease and concomitant heart failure, home-based telerehabilitation was associated with improvements in disease-specific quality of life measures, including the Minnesota Living with Heart Failure Questionnaire and the COPD Assessment Test [1]. Post-acute hip fracture telerehabilitation also resulted in improvements in quality of life and patient satisfaction when compared with usual care [8].

6.4 Mortality and Hospitalization

Health service outcomes, including hospitalization and mortality, improved in selected trials. Bernocchi et al. reported a longer time to hospitalization or death in the telerehabilitation group compared with controls among older adults with chronic obstructive pulmonary disease and heart failure [1]. Clinical practice guidelines for hip fracture rehabilitation have also highlighted reductions in hospitalization and mortality associated with multidisciplinary rehabilitation models [7].

Furthermore, the HIPFRA trial was specifically designed to evaluate whether prolonged home-based physiotherapy can delay institutionalization and reduce social and healthcare costs among frail older adults and individuals with recent hip fracture [9].

7. Health System Implications

7.1 Cost-Effectiveness

Economic evidence supports home-based physiotherapy as a cost-effective and, in some contexts, cost-saving intervention. The HOP-UP-PT program was estimated to generate savings ranging from USD 123,500 to USD 1.6 million per 100 older adults at high risk of falls, based on the magnitude of fall reduction and associated medical and personal care costs [2]. Multidisciplinary rehabilitation models for hip fracture were also considered cost-effective based on cost per quality-adjusted life-year (QALY) estimates [7].

In a structured home-based rehabilitation context, Alves et al. reported physical and psychological health benefits without increases in health or social care costs [23]. In addition, the HIPFRA trial was designed to quantify social and healthcare service costs over a 24-month period and to assess whether prolonged home-based physiotherapy can delay institutionalization among frail older adults and those with recent hip fracture [9].

7.2 Health Service Utilization

Reductions in health service utilization were reported across selected studies, primarily driven by decreases in falls and reduced rates of rehospitalization. Home-based telerehabilitation was associated with lower rehospitalization among older adults with chronic obstructive pulmonary disease and concomitant heart failure [1]. The Telephysiotherapy for Older People (TOP-UP) program also demonstrated reductions in falls, a major contributor to emergency department visits and hospital admissions among older adults [12].

In addition, the HERO (Home-based Extended Rehabilitation for Older People) program was designed to evaluate hospital readmissions and admissions to long-term care facilities as secondary outcomes following discharge among frail older adults [5].

7.3 Barriers and Facilitators to Implementation

Implementation barriers include reimbursement models that require physician referral, thereby limiting access to physiotherapy services [2], as well as challenges related to clinician uptake of new rehabilitation strategies [18]. Additional barriers include organizational constraints, low reimbursement rates, short lengths of stay, and suboptimal interprofessional collaboration within multidisciplinary rehabilitation models [7].

Facilitators to implementation include high levels of patient satisfaction and acceptability, as demonstrated by strong participant endorsement in the Telephysiotherapy for Older People (TOP-UP) program [12], as well as clear feasibility signals reported across multiple telehealth-based rehabilitation programs [8].

7.4 Scalability and Public Policy

Scalability of home-based physiotherapy and telerehabilitation interventions is supported by evidence from larger implementation-oriented trials, such as the Telephysiotherapy for Older People (TOP-UP) program [12]. Broader integration into health systems will require targeted investments in telehealth infrastructure, workforce training, and reimbursement reforms. Policy strategies may include expanded coverage for home-based physiotherapy and telerehabilitation services, as well as the adoption of direct access models that do not require mandatory physician referral [2,7,18].

8. Discussion

Across diverse older adult populations, the available evidence consistently supports home-based physiotherapy as an effective approach for improving mobility, balance, functional independence, and quality of life, while reducing falls and selected health service outcomes. Telerehabilitation, in particular, stands out as a scalable modality, with evidence demonstrating noninferiority and, in specific clinical contexts, superiority compared with traditional in-person rehabilitation [4,12,16,19,20]. Structured exercise and balance training programs showed consistent effects in fall prevention across multiple populations [2,3,21]. Multidisciplinary rehabilitation approaches may yield additional benefits for older adults with complex health needs [1,7,21].

Despite these positive findings, several limitations should be acknowledged. A proportion of the included studies were protocols or feasibility investigations with pending or preliminary outcomes [5,6,8,9,13]. Heterogeneity in outcome measures, particularly those related to participation and life-role domains, limited direct comparability across studies [18]. In addition, small sample sizes and recruitment or retention challenges were reported in some feasibility studies, posing potential barriers to large-scale implementation [8,13]. Long-term follow-up data remain limited in much of the existing literature, and the majority of evidence derives from high-income countries, which may restrict generalizability to low- and middle-income health system contexts [20].

9. Future Directions and Recommendations

Future research should prioritize large-scale randomized controlled trials with follow-up periods of at least 24 months, comparative effectiveness studies of different telerehabilitation modalities, implementation research guided by established implementation science frameworks, and comprehensive economic evaluations that incorporate societal perspectives. From a clinical standpoint, structured home-based physiotherapy programs should be expanded across key populations, including frail older adults, post-stroke patients, individuals with chronic obstructive pulmonary disease and heart failure, and

those undergoing postoperative recovery. Telerehabilitation should be integrated as a complementary or alternative modality when appropriate. At the policy level, efforts should focus on addressing financing barriers, expanding telehealth coverage, and investing in workforce development and digital infrastructure to support sustainable implementation.

10. Conclusion

This evidence-based narrative review demonstrates consistent evidence that home-based physiotherapy improves functional outcomes, balance, and mobility among older adults across diverse clinical populations. The findings indicate that home-based interventions, including telerehabilitation, are effective in reducing falls, enhancing functional independence, and improving quality of life, while potentially decreasing healthcare utilization and associated costs.

From a health systems perspective, home-based physiotherapy represents a scalable and cost-effective strategy to address the growing rehabilitation demands of aging populations. Despite heterogeneity in intervention models and outcome measures, the overall body of evidence supports the integration of structured home-based and telehealth-supported physiotherapy programs into routine care for older adults. Future research should focus on long-term outcomes, implementation strategies, and evaluations across diverse healthcare settings to further strengthen the evidence base.

Research Ethics Committee Approval: None.

Acknowledgments: None.

Conflicts of Interest: None.

Supplementary Materials: None.

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