JBI

BEST PRACTICE

Evidence-based information sheets for health professionals

Effectiveness of physical rehabilitation for physical functioning and quality of life in long-term care residents with dementia

Recommendations*

- Physical rehabilitation may be considered as an intervention to maintain or improve ADLs among LTC residents with dementia. **(Grade B)**
- Physical rehabilitation can be provided in the form of an individualized multicomponent exercise program including strength, balance, and aerobic training. **(Grade B)**
- Policymakers may consider supporting the implementation of physical rehabilitation as an intervention to maintain or improve ADLs among LTC residents with dementia. **(Grade B)**

* Please refer to: JBI's Grades of Recommendation

Information source

This Best Practice Information Sheet is a summary of evidence derived from a systematic review published in 2024 in *JBI Evidence Synthesis.*[1]

Background

Long-term care (LTC) is defined as a residential home for people who are unable to live independently, and who require access to nursing, personal care, support, and/or supervision. Residents in LTC often live with multiple chronic conditions, including dementia. Dementia is an umbrella term encompassing several disorders (eg, Alzheimer's disease, frontotemporal dementia, dementia with Lewy bodies, vascular dementia) that result in significant declines in cognition, limiting a person's ability to live independently. Dementia often results in progressive cognitive impairment, communication deficits, behavioral changes and disinhibition, falls, incontinence, and rigidity. Subsequently, LTC residents living with dementia also often have impaired physical functioning and quality of life.

Physical rehabilitation may improve physical functioning and quality of life for individuals living with dementia. Physical rehabilitation focuses on promoting physical activity; preventing movement impairments and activity limitations; providing interventions to support movement, function, and quality of life; and making modifications to enable participation in society. However, many LTC residents with dementia do not receive physical rehabilitation. Residents with dementia are less likely to receive physical rehabilitation than those without, and many studies examining rehabilitation interventions in LTC exclude residents with dementia. Further, physical rehabilitation providers often become frustrated when interventions for people with dementia do not achieve the intended results because the intervention is ineffective or the anticipated results are unrealistic. Previous syntheses have focused on all residents in LTC, specific professions, interventions, or people with dementia in the community.

This review, however, focuses on LTC residents with dementia and employs a broader definition of physical rehabilitation. The review findings aim to guide practice in the LTC sector, where many residents live with dementia.

Objectives

The objective was to examine the effectiveness of physical rehabilitation versus non-rehabilitation comparators for performance-based physical functioning (activities of daily living [ADLs] and specific functional tasks) and quality of life for LTC residents with dementia.

Types of intervention

This review included studies focused on LTC residents with any severity or form of dementia. Residents of all ages, sexes, and genders were included. We defined LTC as homes that provide health and personal care services for people living with medical or physical needs who require access to 24-hour nursing care, personal care, or other therapeutic and support services. We included studies that evaluated physical rehabilitation that promoted increased performance-based physical activity or included an exercise component. All dosages/intensities, modes of delivery, and frequency/duration/timing of delivery were considered.

Quality of the research

Methods undertaken in the systematic review followed JBI methodology for reviews of effectiveness. A comprehensive search was undertaken and studies that met the inclusion criteria were critically appraised by 2 independent reviewers using JBI critical appraisal tools. A total of 34 reports from 33 studies were included: 28 randomized controlled trials (RCTs), with 2 studies assessed as high risk of bias, 22 unclear, and 4 assessed as low risk of bias; and 6 non-randomized trials, with 2 studies assessed as unclear risk of bias and 4 studies assessed as low risk of bias. The sample size ranged from 11 to 191 participants. Intention to treat analysis was not included in 12 articles, and only 1 trial explicitly reported blinding of participants.

Findings

Studies were conducted in the Netherlands, Canada, United States, Australia, Germany, France, Taiwan, Sweden, Austria, Portugal, Belgium, Norway, Spain, Japan, and Italy. Studies were published between 1997 and 2022. Most studies had a larger proportion of female participants. The mean age ranged from 75.5 to 88.3 years. Twenty-four studies included residents with moderate cognitive impairment, 5 studies included those with severe impairment, and 2 studies included those with mild impairment. Most studies required participants to be able to stand and walk independently with or without a gait aid and be able to participate in physical exercise.

The most frequent intervention was a multicomponent exercise program including lower extremity and upper extremity muscle strength and endurance, static and dynamic balance, functional training (including gait speed and endurance), or aerobic training delivered as a group exercise program. Sessions ranged from 15 to 240 minutes in length and were delivered over 1 to 6 days per week. Programs lasted between 6 and 52 weeks. Interventions were mostly delivered by fitness or exercise instructors or physiotherapists. Twenty-three of the included studies reported tailoring of the intervention, which often included adjusting the intensity and volume of the exercise to individual abilities or in consideration of comorbidities. Adherence was reported in 13 of the included studies and was most frequently reported as attendance at exercise sessions (33% to 100%). Most studies compared physical rehabilitation to usual care or a social control activity (eg, drinking tea, watching movies).

Activities of daily living

Physical rehabilitation may improve ADLs (low-certainty evidence; 12 RCTs, 1348 participants, SMD 0.78; 95% CI 0.27 to 1.30, P=0.003, I^2=95).

Lower extremity strength and endurance

There was no difference in lower extremity strength and endurance assessed with the 30-second Sit to Stand Test (moderate-certainty evidence; 2 RCTs, 293 participants, MD 0.79 repetitions; 95% CI –0.45 to 2.03, P=0.213, I^2=26)

Lower extremity function

Physical rehabilitation may result in a slight increase in lower extremity function assessed with the Short Physical Performance Battery Score (low-certainty evidence; 3 RCTs, 258 participants, MD 3.01 points; 95% CI 1.37 to 4.66, P=0.017, I^2=76); little to no difference in lower extremity function assessed with the Timed Up and Go Test (moderate-certainty evidence; 3 RCTs, 275 participants, MD –2.89 seconds; 95% CI –6.62 to 0.84, P=0.129, I^2=0); and uncertain effect when assessed with the Five Times Sit to Stand Test (very low-certainty evidence, data not pooled).

Lower extremity endurance

The evidence was very uncertain about the effect of physical rehabilitation on lower extremity endurance when assessed with the 6-Minute Walk Test (very-low-certainty evidence; 4 RCTs, 363 participants, MD 17.32 seconds; 95% CI –29.41 to 64.05, P=0.467, I^2=68).

Gait speed

Physical rehabilitation may result in little to no improvement in gait speed when assessed with the Timed Walk Test (low-certainty evidence; 4 RCTs, 400 participants, MD 0.10 meters/seconds; 95% CI –0.02 to 0.22, P=0.117, I^2=84).

Upper extremity function

The evidence was very uncertain about the effect of physical rehabilitation on upper extremity function when assessed with the grip strength test (very low-certainty evidence; data not pooled).

Quality of life

There was little to no difference in quality of life following physical rehabilitation when assessed with the dementia-specific quality-of-life instrument (QUALIDEM), Quality of Life in Late-Stage Dementia Scale (QUALID), Quality of Life – Alzheimer Disease Scale (QoL-AD; low-certainty evidence; 4 RCTs, 419 participants, SMD 0.20; 95% CI –0.08 to 0.47, P=0.138, I^2=46).

Conclusions

Long-term care residents living with dementia often have worse physical functioning and quality of life than LTC residents without dementia. Physical rehabilitation has the potential to improve physical functioning and quality of life for residents with dementia; however, the reporting of its delivery and its provision are often suboptimal.

The findings from the review provide a comprehensive synthesis of 34 reports from 33 studies to evaluate the effectiveness of physical rehabilitation on physical functioning and quality of life. Many of the rehabilitation protocols in the included studies focused on increasing activity or walking, while few were individually tailored or at an intensity appropriate to induce therapeutic effects on physical function.

Physical function was also measured via several outcome measures, limiting our ability to pool results. The meta-analyses of this review demonstrate that physical rehabilitation may improve ADLs; however, the certainty of the evidence is low. While physical rehabilitation demonstrated slight improvements in some domains of specific physical tasks, such as those measured by the Short Physical Performance Battery, little to no difference was observed in other domains, such as gait speed. Overall, the certainty of the evidence for assessing the impact of rehabilitation on physical functioning was low. Finally, we found low-certainty evidence that physical rehabilitation may make little to no difference in quality of life.

Implications for practice

The findings of the systematic review highlight the potential benefits of physical rehabilitation for LTC residents with dementia. The evidence suggests that physical rehabilitation may be an effective intervention to maintain or improve ADLs among this population; however, caution is required when interpreting these results due to the low certainty of the evidence. When physical rehabilitation is used, an individualized multicomponent exercise program that includes elements of upper and lower extremity muscle strength, static and dynamic balance, and aerobic training has shown promise in enhancing ADLs. It is suggested that policymakers consider supporting the implementation of such physical rehabilitation programs in LTC settings to improve ADLs for residents with dementia.

In conclusion, integrating physical rehabilitation into the routine care of LTC residents with dementia could play a crucial role in promoting their independence and overall quality of life. Future research should continue to explore and refine these interventions to maximize their effectiveness and accessibility in diverse LTC settings.

Effectiveness of physical rehabilitation for physical functioning and quality of life in long-term care residents with dementia

POPULATION
Residents of LTC facilities with any severity or form of dementia

INTERVENTION
Rehabilitation interventions that promote increased physical activity or include an exercise component

OUTCOME
Physical functioning, including ADLs, specific functional tasks, and quality of life

FINDINGS

Physical rehabilitation has uncertain or little to no effect on:

- Lower extremity strength & endurance
- Lower extremity function
- Lower extremity endurance
- Gait speed
- Upper extremity function
- Quality of life

Physical rehabilitation may improve activities of daily living

RECOMMENDATIONS FOR PRACTICE

- Physical rehabilitation may be considered as an intervention to maintain or improve ADLs among LTC residents with dementia. (Grade B)
- Physical rehabilitation can be provided in the form of an individualized multicomponent exercise program including strength, balance, and aerobic training. (Grade B)
- Policymakers may consider supporting the implementation of physical rehabilitation as an intervention to maintain or improve ADLs among LTC residents with dementia. (Grade B)

References

1. McArthur C, Alizadehsaravi N, Affoo R, Cooke K, Douglas N, Earl M, et al. Effectiveness of physical rehabilitation for physical functioning and quality of life in long-term care residents with dementia: a systematic review and meta-analysis. *JBI Evid Synth.* 2024; 22(8):1460-535.

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