

programs can be more effective by addressing frailty in an interdisciplinary manner.

Keywords: Aging, Frailty, Functional Capacity

Conflict of interest: The authors declare no conflict of interest.

Funding: UNISAGRADO/FAP.

Ethics committee approval: No.5.690.291.

Registration: Not applicable.

<https://doi.org/10.1016/j.bjpt.2025.101312>

50

EFFECTS OF PHYSICAL EXERCISE AND DUAL-TASK COGNITIVE STIMULATION ON COGNITIVE DECLINE IN TYPE 2 DIABETES: AN INTEGRATIVE REVIEW

Josilayne Patrícia Ramos Carvalho,
Renan Wallace Guimarães da Rocha, Renato Sobral Monteiro Junior,
Elren Passos Monteiro, Cristovam Wanderley Picanço Diniz,
Natáli Valim Oliver Bento-Torres
Universidade Federal do Pará (UFPA), Belém, PA, Brazil

Background: Type 2 Diabetes Mellitus (T2DM) is associated with cognitive decline in older adults due to metabolic, neuroinflammatory, and vascular alterations. These changes contribute to functional impairment, increasing the risk of falls and dependence on daily activities. Effective interventions are necessary to mitigate these effects and promote healthy aging. Physical exercise, particularly resistance training, and dual-task cognitive stimulation have been proposed as promising strategies to enhance cognitive function and functional independence in this population.

Objectives: This study aimed to analyze the effects of physical exercise and dual-task cognitive stimulation on cognitive decline in individuals with T2DM through an integrative review of the literature.

Methods: An integrative review was conducted by searching PubMed, SciELO, LILACS, Web of Science, and Scopus databases. Original studies, systematic reviews, and meta-analyses published between 2005 and 2025 were included. The selected studies investigated interventions involving physical exercise and dual-task cognitive stimulation targeting cognitive decline in individuals with T2DM. Studies were analyzed regarding methodological characteristics, interventions, and cognitive outcomes.

Results: The findings indicate that insulin resistance, neuroinflammation, and vascular dysfunction contribute to cognitive decline in individuals with T2DM. Physical exercise, especially resistance training, and dual-task interventions have demonstrated benefits in neural plasticity, cerebral metabolism, and cognitive function. Improvements were observed in executive functions, memory, attention, balance, and motor coordination, which are crucial for functional independence and fall prevention. However, the methodological heterogeneity across studies and the limited number of longitudinal clinical trials highlight the need for further research.

Conclusion: Evidence suggests that physical exercise and dual-task cognitive stimulation are effective in mitigating cognitive decline in older adults with T2DM. These interventions contribute to glycemic control, reduce neuroinflammation, and improve cognitive and motor functions. Future studies should focus on high-quality, longitudinal clinical trials to establish standardized protocols and confirm long-term benefits.

Implications: The incorporation of resistance training and dual-task cognitive stimulation into rehabilitation programs for individuals with T2DM may enhance cognitive and functional outcomes, promoting independence and reducing the risk of falls. Further

research is needed to strengthen evidence-based practice in this field.

Keywords: Type 2 Diabetes Mellitus, Cognitive Decline, Rehabilitation

Conflict of interest: The authors declare no conflict of interest.

Funding: CAPES - Finance Code 001.

Ethics committee approval: No. 6.973.574.

Registration: Not applicable.

<https://doi.org/10.1016/j.bjpt.2025.101313>

51

EXERCISE INTERVENTIONS FOR GAIT IN OLDER ADULTS WITH OSTEOPOROSIS: A NARRATIVE REVIEW

Sophia Natsumi Yamawaki Dohara, Paula Maria Borges de Salles,
Eduardo Penna

*Programa de Pós-Graduação em Ciências do Movimento Humano,
Universidade Federal do Pará (UFPA), Belém, PA, Brazil*

Background: Older adults with osteoporosis may exhibit impaired gait due to structural and biomechanical changes and, in addition to age-related changes, such as reduced muscle mass and strength, balance impairments and reduced motor control and cognitive function, they are more susceptible to falls and fractures. Therefore, interventions focused on gait in this population are important for maintaining functional independence and quality of life.

Objectives: To organize scientific literature from the last 10 years on exercises designed to improve gait parameters in older adults with osteoporosis.

Methods: The Health Sciences Descriptors (DeCS/MeSH) used to search for articles were “osteoporosis”, “exercise”, “gait” and “aged” in the Cochrane Library and PubMed databases as well as in the Web of Science database via the CAPES Portal. Articles published in the last 10 years in English that studied the effects of exercise on gait in older adults with osteoporosis were included. After reviewing the titles and abstracts, review articles, meta-analyses, case reports, pilot studies, cross-sectional studies, duplicate articles, restricted access articles and those not directly responding to the objectives of this review were excluded.

Results: After the articles search and application of inclusion and exclusion criteria, 4 articles were analyzed for this review. It is important to emphasize that 2 articles provided follow-up data from the other 2 original studies included in this review, presenting the long-term effects of the interventions performed. One of the interventions consisted of balance training associated with resistance training for 12 weeks, with sessions twice a week. The other intervention involved dual-task and multi-task balance training with and without the addition of walking for at least 30 minutes, also for 12 weeks, three sessions per week. It is noteworthy that most of the study sample consisted of elderly women with osteoporosis. Balance training associated with resistance training did not provide significant effects in the gait speed of older women with osteoporosis immediately after the intervention or three months after the intervention when compared with the control group. However, balance training with dual-task and multi-task exercises, with and without the addition of walking, promoted improvements in the preferred walking speed and fast walking speed of elderly individuals in the short term, with the benefits remaining for six months after the intervention.

Conclusion: Balance training is an intervention of interest for studying the improvement of the gait of older adults with osteoporosis, especially when combined with multi-task training involving cognitive and/or motor demands. Further research is suggested to