

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

Keywords: Aging, Frailty, Functional Capacity

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

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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

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

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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

analyze gait as the primary outcome of interventions with different exercise modalities for both elderly men and women with osteoporosis, in order to define more effective short and long-term strategies for this population.

Implications: From this review, it is still difficult to determine whether balance training combined with other types of exercise brings benefits to elderly people with osteoporosis. However, balance training with multi-task exercises deserves attention, as it simulates everyday situations, making elderly people more prepared and confident while walking.

Keywords: Aged, Gait, Osteoporosis

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PREVALENCE AND FACTORS ASSOCIATED WITH CHRONIC BACK PAIN IN ELDERLY BRAZILIANS: DATA FROM THE 2019 NATIONAL HEALTH SURVEY

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Background: Chronic back pain (CHP) is a prevalent condition in the general population and has been associated with socioeconomic, clinical, and health factors. Despite this, studies with elderly people involving all regions of Brazil are not yet available.

Objectives: To analyze the prevalence and factors associated with chronic back pain in elderly Brazilians.

Methods: This is a cross-sectional study that used data from the 2019 National Health Survey, with 23,144 people aged 60 years or older. The factors associated with CHD were established based on the estimates of odds ratios by the binary logistic regression model, using the Statistical Package for the Social Sciences (SPSS) program, version 27.0.

Results: The prevalence of CHD among elderly Brazilians corresponded to 31.1% (95% CI: 31.0-31.1). The following variables were consolidated as associated factors: male sex (OR: 0.88; 95% CI: 0.87-0.89), age group from 70 to 79 years (OR: 1.16; 95% CI: 1.15-1.16) and 80 years and over (OR: 1.16; 95% CI: 1.15-1.17); lack of education (OR: 1.06; 95% CI: 1.06-1.07), 1 to 4 years of education (OR: 1.47; 95% CI: 1.45-1.48), 5 to 8 years of education (OR: 0.94; 95% CI: 0.93-0.96); income of up to 1 minimum wage (OR: 1.42; 95% CI: 1.40-1.43), 1 to 2 minimum wages (OR: 1.29; 95% CI: 1.28-1.31); absence of partner (OR: 1.16; 95% CI: 1.15-1.16); perception of health as regular (OR: 0.61; 95% CI: 0.60-0.62) and poor/very poor (OR: 1.26; 95% CI: 1.25-1.27); sleep problems (OR: 0.85; 95% CI: 0.84-0.86); presence of multimorbidities (OR: 0.74; 95% CI: 0.73-0.74); use of medications (OR: 3.17; 95% CI: 3.14-3.20); dependence for basic (OR: 0.40; 95% CI: 0.39-0.40) and instrumental activities of daily living (OR: 1.19; 95% CI: 1.18-1.20); body mass index (OR: 1.02; 95% CI: 1.02-1.02); depression (OR: 1.19; 95% CI: 1.18-1.20); and occurrence of falls (OR: 0.63; 95% CI: 0.62-0.63).

Conclusion: The prevalence of CHD was high and associated with socioeconomic, clinical, and health variables.

Implications: The results shown may provide support for the implementation of health actions aimed at elderly Brazilians.

Keywords: Elderly health, Risk factors, Back pain

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THE INFLUENCE OF VISUAL CONTRIBUTION ON MUSCLE ACTIVITY DURING VISUAL FEEDBACK TASKS WHILE STANDING

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Background: Visual biofeedback has been widely used in training programs aimed at improving postural balance through the reduction of postural sway. However, studies have shown variability between individuals in their ability to reduce postural sway while using visual biofeedback, suggesting that some individuals may not rely heavily on visual cues to adjust their posture. An important question arising from these findings is whether individuals who rely on visual information differ from those who do not in their postural strategies when engaging in biofeedback tasks.

Objectives: This study investigated the effect of visual contribution on muscle activity and postural sway in young adults while standing and using different visual biofeedback tasks.

Methods: Twenty participants performed four distinct postural tasks, each lasting sixty (60) seconds: (1) Eyes open (EO), as a control condition; (2) Eyes closed (EC); (3) center of pressure (CoP) biofeedback using 2 cm (3a) and 4 cm (3b) targets; and (4) wrist-controlled laser biofeedback. Electromyograms (EMG) were collected from the right tibialis anterior (TA) and medial gastrocnemius (MG), and CoP displacement was measured in the anterior-posterior (AP) and medial-lateral (ML) directions. The index, based on percentage difference of COP sway area [(EC area EO area)/(EC area +EO area) × 100] was used to determine the weight of visual information in postural control, dividing individuals into vision or non-visual. The Friedman test was used, followed by the post-hoc Wilcoxon test for pairwise comparisons between conditions, with a significance level of 5%.

Results: Eight individuals were classified as visual, with a larger COP sway area in the EC than in the EO condition, while eleven (~58%) were classified as non-visual. In the visual group and when considering CoP biofeedback, the RMS of TA activity increased when using 2 cm target ($p = 0.047$) in relation to EO, but without differences in CoP variability. In the non-visual group, there were no significant differences in muscle activity, but the SD of the AP CoP and CoP sway area decreased with the 2 cm and 4 cm targets when compared to EO ($p < 0.05$). For laser biofeedback, no differences in muscle activity were observed; however, the SD of the AP CoP increased during this biofeedback task compared to the EO condition, regardless of the visual group.

Conclusion: Postural adaptations to CoP biofeedback appear to depend on an individual's reliance on vision for postural control and