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Background: Aging is associated with changes that lead to a decline in functionality, limiting the performance of activities of daily living (ADLs). Older adults living in long-term care facilities (LTCFs) have fewer opportunities to actively engage in these activities, which affects their independence and autonomy. So far, there is limited evidence on the effects of interventions aimed at improving functionality in LTCF residents, as most studies focus on community-dwelling older adults.
Objectives: To evaluate the effectiveness of the Vivifrail program in combating frailty syndrome in institutionalized older adults by analyzing the program's effects on improving balance and muscle function in this population.
Methods: The study is a randomized clinical trial conducted over a three-month period with two weekly sessions in long-term care facilities (LTCF). A total of 30 female volunteers over the age of 60 participated, forming two groups: the Vivifrail Group (VG), which underwent multicomponent training, and the Control Group (CG), which received usual care. The training followed the Vivifrail model, adjusted according to the participants' initial functional capacity, categorizing them as "frail," "pre-frail," or "independent." Participants were assessed before starting the intervention and four weeks after its completion.
Results: Thirty older women were included in the study, with a mean age of 86 years. There were no statistically significant differences between the groups at the pre-intervention stage. However, post-intervention analysis revealed statistically significant differences in frailty levels, with lower frailty scores in the intervention group. Notably, the intervention group showed an improvement of nearly two points in the SPPB assessment, an increase of approximately 5 kg/f in handgrip strength, and a reduction of nearly 5 seconds in the time required to complete the five-times sit-to-stand test.
Conclusion: In this sample, the Vivifrail program proved effective as a strategy for combating and preventing frailty syndrome, according to Fried's Frailty Phenotype.
Implications: The results suggest that the Vivifrail program can be implemented to reduce frailty and the risk of falls. Furthermore, its adoption in LTCFs may promote greater independence and quality of life for this population.
Keywords: Multicomponent Training, Elderly, Frailty

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EVALUATION OF THE OPTIMIZATION OF POSTURAL BALANCE CONTROL DURING THE USE OF VISUAL BIOFEEDBACK

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Background: Limiting postural sway within specific boundaries while standing is essential for maintaining stability and preventing falls. This has driven the development of biofeedback-based balance training protocols designed to minimize postural sway. Although visual biofeedback protocols have been shown to effectively reduce sway, this reduction is frequently associated with increased muscular effort. Consequently, it remains uncertain whether biofeedback-induced sway reduction results in optimal postural control.
Objectives: This study aims to investigate whole-body stability during upright posture using biofeedback protocols by applying a set of variables characterizing the mathematical optimization process that minimizes the postural sway in terms of CoP coordinates.
Methods: Seventeen participants performed three 60-second postural tasks: (1) eyes open (EO) as a control; (2) center of pressure (CoP) biofeedback; and (3) wrist-controlled laser biofeedback. Posturographic variables were extracted to characterize the optimization process, focusing on downhill, stability, and convergence properties. The downhill property included: (1) percentage of signal duration with a strictly decreasing cost function (t, %), and (2) average maximum absolute convergence rate (|?|, mm/s). Stability was quantified by: (1) number of local minima (min_N), (2) their average values (min_L, mm), and (3) variability (min_SD, mm). Convergence was assessed by: (1) global minimum value (min_G, mm), and (2) absolute difference between global and expected minima (|?_GL|, mm). Statistical analysis used repeated measures ANOVA with Holm correction ($p < 0.05$) to assess condition effects.
Results: Significant main effects of condition were revealed on the following outcomes: Expected Local Minimum (min.L) ($F(2, 32) = 3.320$, $p = 0.049$; BF COP: M = 3.364, SD = 7.064; BF Laser: M = 10.761, SD = 19.650; OA: M = 0.691, SD = 1.062), Dispersion of Local Minima (min.SD) ($F(2, 32) = 3.622$, $p = 0.038$; BF COP: M = 3.185, SD = 6.777; BF Laser: M = 11.126, SD = 20.083; OA: M = 0.553, SD = 0.972), and Error (delta.GL) ($F(2, 32) = 3.351$, $p = 0.048$; BF COP: M = -3.263, SD = 6.862; BF Laser: M = -10.579, SD = 19.308; OA: M = -0.651, SD = 1.023). Post hoc comparisons showed significant differences between BF Laser and OA for dispersion ($p = 0.044$) and trends for Expected Local Minimum ($p = 0.055$) and Error ($p = 0.054$). No significant effects were found for other outcomes ($p > 0.05$).
Conclusion: This study shows that different biofeedback protocols affect postural control optimization differently. Wrist-controlled laser biofeedback (BF Laser) led to higher local minima, greater dispersion, and larger errors compared to center of pressure (CoP) biofeedback and the eyes-open (EO) condition, suggesting BF Laser imposes greater stability demands. In contrast, CoP biofeedback and EO demonstrated more stable and convergent control, indicating a more efficient optimization process.
Implications: These results highlight the importance of selecting biofeedback protocols that align with the goals of postural training, as not all protocols equally promote optimal postural control. Future research should explore the underlying mechanisms and long-term effects of these protocols to refine biofeedback-based balance training strategies.
Keywords: Postural Control, Biofeedback, Optimization

Conflict of interest: The authors declare no conflict of interest.
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THE SIX MINUTE WALK TEST CAN ESTIMATE THE PHYSICAL ACTIVITY LEVELS OF COMMUNITY-DWELLING OLDER ADULTS: A CROSS-SECTIONAL STUDY

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