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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

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

**Funding:** Not applicable.

**Ethics committee approval:** CEUA No. 7621030624.

**Registration:** Not applicable.

<https://doi.org/10.1016/j.bjpt.2025.101303>

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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.

**Funding:** This study was supported by the FAPERJ (No. E-26/211.104/2021) and CAPES (Finance Code 001; No. 88881.708719/2022-01, and No. 88887.708718/2022-00).

**Ethics committee approval:** CEUA N° 7621030624.

**Registration:** Not applicable.

<https://doi.org/10.1016/j.bjpt.2025.101304>

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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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**Background:** Physical activity is a key determinant of health in older adults, enhancing physical and mental well-being, reducing mortality risks, and improving overall functioning. However, many older adults remain insufficiently active despite the World Health Organization's recommendations of at least 150 minutes of moderate-intensity physical activity per week.

**Objectives:** This study aimed to explore correlations between physical activity levels measured by subjective (IPAQ) and objective (activity monitors) assessments in older adults. Additionally, the study sought to identify functional tests that could correlate with activity levels and establish cut-off points for these tests.

**Methods:** Participants included 90 older adults who were assessed using the IPAQ, an activity monitor, and functional tests such as the 6-Minute Walking Test (6MWT), Timed Up and Go (TUG), and Berg Balance Scale (BBS). Data were analyzed using Spearman's correlation and Receiver Operating Characteristics (ROC) analysis.

**Results:** No significant correlation was found between the IPAQ (self-reported) and activity monitor data (objective). The activity monitor showed lower levels of physical activity than the IPAQ, suggesting potential overestimation in self-reports. A moderate correlation was observed between the 6MWT and moderate-to-vigorous physical activity (MVPA) levels. ROC analysis of the 6MWT revealed an Area Under the Curve (AUC) of 0.83, indicating good discriminatory capacity with a cut-off of 273.9 meters (walking speed of 0.76 m/s) to identify those achieving the recommended 150 minutes of MVPA.

**Conclusion:** Objective and subjective physical activity levels were not correlated in older adults, who may overestimate their physical activity levels, with self-reported activity levels higher than objective ones. Clinical testing can add value to assessing physical activity levels, with the 6MWT being correlated with objective measures. Further research is recommended to validate the 6MWT across different populations and health conditions to expand its use in clinical settings.

**Implications:** Clinicians may not rely solely on physical activity levels reported by older adults. The 6MWT could be a practical tool for assessing physical activity in them, offering valuable insights for rehabilitation programs and complementing subjective assessments.

**Keywords:** Older adults, physical activity, activity monitor, clinical evaluation

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

**Funding:** Not applicable.

**Ethics committee approval:** CAAE: 52759521.2.0000.5259.

**Registration:** Not applicable.

<https://doi.org/10.1016/j.bjpt.2025.101305>

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## ASSOCIATION AND AGREEMENT OF SUBJECTIVE AND OBJECTIVE MEASUREMENT OF PHYSICAL ACTIVITY LEVEL IN OLDER ADULTS - A CROSS-SECTIONAL STUDY

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**Background:** The World Health Organization emphasizes that maintaining functional abilities is essential for the health and well-being of older adults. Among the recommended strategies, regular physical activity is central to the role in preventing diseases and promoting active longevity. However, physical inactivity and sedentary time represent increasing challenges associated with chronic diseases and reduced quality of life. Assessment of physical activity levels is globally examined through self-reported questionnaires, although their accuracy in older adults still generates debate in the literature. In this context, the combination of objective measures, such as accelerometry and self-reporting, can improve the assessment of physical activity levels and support effective strategies for health promotion and prevention.

**Objectives:** To evaluate the association and agreement between subjective and objective methods of measuring physical activity in community-dwelling older adults.

**Methods:** In SPSS 20.0, descriptive analysis, frequency distribution of categorical variables, central tendency analysis, dispersion measures of continuous variables, Pearson's Chi-square test and Kappa coefficient were performed. The Active Australia Questionnaire (AAQ) and the International Physical Activity Questionnaire (IPAQ) were used for the subjective assessment of the level of physical activity, and the accelerometer (Actigraph®, Pensacola, Fla, USA; Model GT9X Link; ActiLife Software version 6.11.5) was used for the objective assessment for 7 consecutive days. The Pearson's Chi-square test and Kappa coefficient were performed. Statistical significance set at 5%.

**Results:** A total of 35 older adults participated in this cross-sectional study. The mean age was (71.06 ± 9.0 years), 23 (65.7%) females and 12 (34.3%) males, IPAQ (Sedentary 0%, Irregularly active 2.9%, Active 60%, Very active 31.1%), AAQ (Sedentary 0%, Insufficiently active 8.6%, Sufficiently active 91.4%), Actigraphy (Sedentary behavior 65.93%, Light activities 15.99%, Moderate and Vigorous physical activity 6.48%). Association - Person's Chi-square: (AAQ:  $\chi^2 = 0.972$ ,  $P = 0.324$ ), (IPAQ:  $\chi^2 = 6.462$ ,  $P = 0.040$ ). Agreement - Kappa Coefficient: (AAQ:  $P = 0.324$ ), (IPAQ:  $P = 0.451$ ).

**Conclusion:** The results of this study indicate a significant association between the assessment obtained by the IPAQ questionnaire (short version) and the accelerometry measurement by GT9X, although no agreement was observed between the data. This corroborates previous findings in the literature, which state that, although the subjective measure presents reliability and validity, especially in community studies, compared to the standard of data evaluated through accelerometry, it has a low validity criterion. Therefore, an in-depth assessment of the level of physical activity may indicate preventive measures in the health area. In addition, it is essential to continue investigating the multiple facets of physical activity, considering not only the quantity but also the quality and intensity of the practice.

**Implications:** Although self-reported questionnaires are widely used in community studies and present validation in several situations, they should be used with caution, especially in the older adults.

**Keywords:** Aging, Exercise, Healthy Aging

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

**Funding:** FAPEMIG APQ-00277-24, APQ-01328-18, APQ-02363-22, APQ-04955-23, CNPq-402574/2021-4, CNPq-151412/2024-3), (CAPES PROEXT-PG 88881.926996/2023-01.

**Ethics committee approval:** CAAE: 77242824.0.0000.5188.

**Registration:** Not applicable.

<https://doi.org/10.1016/j.bjpt.2025.101306>