CRITICALLY APPRAISED PAPER (CAP)

FOCUSED QUESTION
For older adults living in long-stay institutions such as nursing homes, is a 12-week group ballroom dancing program effective at improving postural balance and reducing falls compared to a sedentary lifestyle?


CLINICAL BOTTOM LINE:
This study demonstrated that a recreational physical activity in the form of a ballroom dancing program could improve postural balance and reduce falls in older adults residing in long-stay institutions. This study has the potential to provide new socially and occupation-based interventions for elderly people living in institutions who often have “fewer opportunities to independently participate in activities and tasks of daily living” that could “minimize and/or alleviate the deleterious effects of aging” (p. 313). Further research is needed to address the full scope of the physical, social, and psychological benefits of a program like the one in this study, and similar programs also must be studied across settings and hopefully with more inclusive sample demographics.

This study informs practitioners of the effectiveness of a group ballroom dance program in producing balance improvements that generalize across contexts and occupations, and expands occupational therapists’ repertoire of meaningful and intrinsically motivating interventions.

RESEARCH OBJECTIVE(S)
List study objectives.

Determine the effectiveness of a 12-week ballroom dancing program consisting of 3 50-minute sessions in improving postural balance and reducing falls in older adults living in a long-stay institution.
DESIGN TYPE AND LEVEL OF EVIDENCE:
Level I: Randomized pretest and posttest trial

Limitations (appropriateness of study design):
Was the study design type appropriate for the knowledge level about this topic? Circle yes or no, and if no, explain.

YES/NO The study built on previous research that showed dance could improve balance in older adults.

SAMPLE SELECTION
How were subjects selected to participate? Please describe.

The researchers initially invited 150 elderly residents from long-stay institutions in Rio de Janeiro, Brazil to participate in the study. Inclusion and exclusion criteria were applied to refine their sample.

Inclusion Criteria
Participants were residents at the study recruitment sites. They had not exercised regularly for at least 3 months, and were functionally autonomous in activities of daily living (ADL).

Exclusion Criteria
Those with conditions that could impede their participation in testing or interventions were excluded; some of the conditions mentioned are “cardiopathy, hypertension, uncontrolled asthmatic bronchitis, osteoarthritis, recent fracture, tendinitis, neurological problems and severe obesity, as well as the use of a prosthesis or medication that could cause attention disorders” (p. 313). Those with cognitive impairments, especially in memory, were excluded to prevent memory biases regarding number of falls experienced.

SAMPLE CHARACTERISTICS
N=62

% Dropouts 4.84%

#/ (%) Male NR

#/ (%) Female NR

Ethnicity NR

Disease/disability diagnosis NR

Check appropriate group:

<20/study group 20–50/study group 51–100/study group ✔ 101–149/study group 150–200/study group
### Intervention(s) and Control Groups

#### Add groups if necessary

| Group 1 | Brief Description | The intervention consisted of triweekly ballroom dancing sessions. Each session began with a 10-minute warm-up period consisting of stretching and low-intensity dance movement, followed by 30 minutes of higher intensity dancing, and concluded with a 10-minute relaxation period with music. The classes covered the following dances: foxtrot, waltz, rumba, swing, samba, bolero, forro, pagode, Baião, cirandas, salsa, merengue, and square dancing. The participants were trained in using the Borg scale to assess their own physical activity in an attempt to standardize intensity of the class phases. |
| Setting | NR |
| Who Delivered? | NR |
| Frequency? | 3 50-minute sessions a week |
| Duration? | 12 weeks |

| Group 2 | Brief Description | Control group participants were told to continue their normal daily activities but not engage in regular physical activity during the 12-week period. After their posttest evaluations, participants in the control group were invited to another ballroom dancing group. |
| Setting | NR |
| Who Delivered? | NR |
| Frequency? | Not applicable |
| Duration? | 12 weeks |

**Intervention Biases:** *Circle yes or no and explain, if needed.*

- **Contamination:** YES/NO
- **Co-intervention:** YES/NO
- **Timing:** YES/NO
- **Site:** YES/NO
Use of different therapists to provide intervention

**YES/NO** It is not specified whether the same therapist provided the intervention across all sessions.

**MEASURES AND OUTCOMES**

Complete for each relevant measure when answering the evidence-based question:
Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article – yes/no/NR [not reported]), and how frequently the measure was used.

**Fall assessment**: Data on the number of falls were obtained through patient interviews and confirmed with medical records. The researchers defined a fall as “any unintentional movement of the body to a level below the initial position with an inability to fix it in a timely manner, as determined by multifactorial circumstances that might compromise the body’s stability” (p. 313).
- **Reliability**: Not reported
- **Validity**: Not reported
- **Frequency**: One interview before the intervention (in the six months before the intervention period), and once after the intervention.

Name of measure, what outcome was measured, whether the measure is reliable and valid (as reported in article – yes/no/NR [not reported]), and how frequently the measure was used.

**Postural balance**: The quality of postural balance was determined based on “the difference between the values reached when distributing the body weight on the right and left sides, between pressure points and between the total mean of all points” (p.313). Lizard stabilometric and posturometric platform was used to measure these imbalances in body weight distribution. The platform contains two load cells that record weight shifts among the six support points of the foot as an individual attempts to maintain postural equilibrium. The measurements were taken in a room with minimal auditory and visual distractions. Participants kept their eyes open and fixed in a horizontal direction, and planted both feet on the platform.
- **Reliability**: High reliability reported
- **Validity**: Not reported
- **Frequency**: Once before the intervention and once after the intervention.

**Measurement Biases**

Were the evaluators blind to treatment status? **Circle yes or no, and if no, explain.**

**YES/NO** There was a lack of blinding during assessment.

Recall or memory bias. **Circle yes or no, and if yes, explain.**

**YES/NO** Potential memory biases regarding falls were minimized by referring to medical records.
RESULTS
List results of outcomes relevant to answering the focused question

Include statistical significance where appropriate ($p < 0.05$)
Include effect size if reported

- Intragroup analysis of postural balance showed that the experimental group significantly improved in postural balance from pre- to posttest ($p = 0.002$). Control group showed no improvements in postural control.
- Intergroup analysis showed more balanced lower limb weight distribution in the experimental group compared to the control group at posttest ($p = 0.012$).
- Effect size for lower limb stabilometer measures was 0.82.
- Intragroup analysis of falls showed that experimental group significantly reduced the number of falls from pre- to posttest ($p < 0.0001$). Control group showed no fall reduction.
- Intergroup analysis showed fewer falls in the experimental group compared to the control group at post-test ($p < 0.0001$).
- Effect size for falls was 2.67.

Was this study adequately powered (large enough to show a difference)? Circle yes or no, and if no, explain.

YES/NO

Were appropriate analytic methods used? Circle yes or no, and if no, explain.

YES/NO

Were statistics appropriately reported (in written or table format)? Circle yes or no, and if no, explain.

YES/NO

For the version of the article found online, Figure 2 was an exact copy of Figure 1, and thus there were two figures on corporal balance and none on fall reduction.

CONCLUSIONS
State the authors’ conclusions that are applicable to answering the evidence-based question.

Participants who enrolled in the 12-week ballroom dancing program not only reduced imbalances in lower limb body weight distribution, but also showed generalized balance improvements as indicated by reduction in number of falls. The paper suggests this dance
program can be “prescribed for better balance and motor performance in the ADL of elderly people” (p. 315). The promising results from this research call for more studies to be done on other types of physical activities and their effect on postural balance and falls reduction. The present study did not address the potential socioemotional benefits of engaging in group leisure activities, so further studies must be conducted to track their effect on elderly people’s mental health, especially depression.

This work is based on the evidence-based literature review completed by Naoya Ogura, OTS, University of Southern California.


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