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Balance and older people

Submission date	Recruitment status	[_] Prospectively registered
07/10/2026	No longer recruiting	[_] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
13/10/2026	Completed	[_] Results
Last Edited	**Condition category**	[_] Individual participant data
13/10/2026	Injury, Occupational Diseases, Poisoning	[X] Record updated in last year

Plain English summary of protocol
Background and study aims
Falls among the elderly can lead to injuries. Research that would support structured training programs for balance compared to conventional education is necessary. This study aim to compare the efficacy of a 4-week supervised balance program on balance and mobility.

Who can participate?
Adults ≥65 years old.

What does the study involve?
Participants were enrolled into the intervention group (balance exercises under supervision) and the control group (education regarding falls and stretching). Four-week intervention included three sessions weekly, each lasting 60 minutes. All patients were assessed at baseline and post-intervention. The outcome measures evaluated balance, functional mobility gait speed.

What are the possible benefits and risks of participating?
Improve balance for elderly people and no risks.

Where is the study run from?
Palestine Ahliya University.

When is the study starting and how long is it expected to run for?
September 2025 to March 2026

Who is funding the study?
Palestine Ahliya University.

Who is the main contact?
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Contact information

Type(s)
Principal investigator, Scientific, Public

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Study information

Scientific Title
A step that changes destiny: how structured balance training reshapes fall prevention in community-dwelling older adults

Study objectives
The major aim of this randomized control trial is to examine the efficiency of the 4-week-long physiotherapy-oriented systemized program aimed at balance improvement in terms of the increase in functional mobility, stability, and speed of gait for older adults at risk of falls, compared to the other group of subjects that have received routine fall prevention education and stretching. It is expected that the group exposed to a structured balance training will demonstrate the significant results in terms of its efficiency.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 14/04/2025, Palestine Ahliya University Research Ethics Committee (Bethlehem, Palestine, Bethlehem, P150, Palestine, State of; -; president@paluniv.edu.ps), ref: CAMS/PTBR/2/425/6

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Blinded (masking used)

Control
Active

Assignment
Parallel

Purpose
Prevention

Study type(s)

Health condition(s) or problem(s) studied
Fall prevention

Interventions
This parallel-group RCT evaluates the effectiveness of a structured balance-training program for reducing the risk of falls in community-dwelling older adults. The study design is superiority-based, with participants randomly assigned to either the treatment or control group based on concealment to minimize selection bias. Blinded examiners conduct evaluations to reduce bias related to measurement and increase internal validity. The intervention extended for four weeks, and measures fall-related outcomes pre and immediately post-intervention to capture the short-term effects.

The intervention group participated in a 4-week, physiotherapy-led balance training protocol involving three 60-minute sessions per week. It comprised a 10-minute warm-up (such as walking in place, ankle pumps), 40 minutes of core balance training and a 10-minute cool-down with stretching exercises. Core balance training was progressive and consisted of:
1. Static balance exercises (such as reduced base of support, single leg stance)
2. Dynamic balance exercises (such as multi-directional stepping, obstacle negotiation)
3. Lower limb strengthening exercises (such as sit-to-stand, heel raise)
4. Sensory integration (such as standing on foam surfaces, closing eyes)
5. Dual task training (such as walking and counting backward)
6. Reactive balance training with small perturbations from the therapist

The exercise program (frequency, intensity, time, and type) was designed based on evidence-based recommendations for fall prevention in older adults. The training protocol included the following domains:

Warm-up (10 minutes): Marching in place, gentle dynamic mobility, ankle pumps, heel-toe raises
Core balance training (40 minutes): Static and dynamic balance drills, stepping tasks, perturbation drills, strength tasks
Cool-down (10 minutes): Stretching of calves, quadriceps, hamstrings; diaphragmatic breathing

Static balance:
1. Narrow stance, semi-tandem, tandem stance (hold 30-60 seconds each, three sets)
2. Single-leg stance with hand support progression (30-60 seconds per leg, three sets)
3. Eyes-open and eyes-closed variations (30-60 seconds, three sets)

Dynamic balance:
1. Multi-direction stepping (anterior, lateral, posterior) (10-15 repetitions per direction, three sets)
2. Obstacle negotiation and step-ups (8-12 repetitions, three sets)
3. Turning and directional transitions (10 repetitions, three sets)

Strengthening focus on anti-gravity musculature:
1. Sit-to-stand without hand use (progressed to weighted) (10-12 repetitions, three sets)
2. Heel raises and toe raises (10-15 repetitions each, three sets)
3. Hip abduction and extension with resistance bands (10-12 repetitions per side, three sets) (Lee & Park,2013)

Sensory integration:
1. Foam-surface stance and gait tasks (30-60 seconds, three sets)
2. Reduced visual input drills (eyes closed, 30-60 seconds, three sets) (Maneemai et al.,2024)

Dual-task challenges:
1. Walking while head-turning (3-5 minutes continuous)
2. Step tasks with cognitive tasks (counting backwards, naming categories) (3-5 minutes) (Varela-Vásquez et al.,2020)

Reactive balance:
1. Therapist-initiated gentle perturbations (anterior/posterior/lateral) (8-10 repetitions per direction, three sets)
2. Controlled reach with destabilizing tasks (8-10 repetitions, three sets)

The participants in the control group received one session of the traditional fall prevention education, covering the general risk factors of falls and safe physical activity. Additionally, the control group participants were provided with a handout with a description of simple stretching routine for major muscle groups. Participants of this group did not participate in any progressive balance training. In order to adhere to ethical research guidelines, the structured program was offered to the control group post-study completion.

Intervention Type
Behavioural

Primary outcome(s)
1. Static and dynamic balance measured using the Berg Balance Scale (BBS) at baseline and post-intervention (4 weeks)

Key secondary outcome(s)
1. Functional mobility measured using Timed Up and Go (TUG) at baseline and post-intervention (4 weeks)

2. Gait speed measured using 4-Meter Gait Speed (4MGS) at baseline and post-intervention (4 weeks)

Completion date
30/04/2026

Eligibility

Key inclusion criteria
1. Independent ambulatory healthy adults over the age of 65 years
2. Medically stable and capable of walking independently (without or with a cane)
3. Either suffered at least one fall in the last year or classified as having increased fall risks based on Timed Up and Go test duration of ≥12 seconds

Healthy volunteers allowed
No

Age group
Senior

Lower age limit
65 Years

Upper age limit
70 Years

Sex
All

Total final enrolment
60

Key exclusion criteria
1. Major neurological or musculoskeletal problems that may render balance training unsafe for the participant
2. Major visual or vestibular disorders impairing balance ability
3. Cognitive impairments (Mini-Mental State Examination ≤24)
4. Use of wheelchair or walker

Date of first enrolment
01/09/2025

Date of final enrolment
30/01/2026

Locations

Countries of recruitment
Palestine, State of

Sponsor information

Organisation
Palestine Ahliya University

ROR
https://ror.org/02gekya22

Funder(s)

Funder type

Funder Name
Palestine Ahliya University

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available