Featured Falls Research – February

Prospective evaluation of balance and mobility tests as part of the World Falls Guidelines algorithm

Saunders S, Speechley M, Griffith LE, Kuspinar A, Sibley KM, Raina P, D'amore C, Richardson J, Noble T, Beauchamp MK. Age Ageing. 2026 Feb 1;55(2):afag028

DOI: 10.1093/ageing/afag028 **PMID:** 41697879

Abstract

Background: Falls are the leading cause of unintentional injury in older adults. While guidelines recommend balance and mobility tests to identify individuals at risk, their ability to predict future falls and improve the World Falls Guidelines (WFG) risk stratification remains uncertain.

Methods: A 12-month prospective cohort study of community-dwelling older adults in Canada (≥65 years) who could walk 10 m without physical assistance. Balance and mobility assessments included the timed up and go (TUG) at usual and fast pace and with a cognitive dual task (cog), the Brief BESTest, five times sit-to-stand, single-leg stance (SLS) and gait speed. Falls were recorded prospectively using monthly fall calendars and quarterly telephone interviews.

Results: Of 514 participants who completed baseline assessments, 486 (95%) completed the 12-month follow-up. Mean age was 76.4 years, 64% were female, and 266 (52%) experienced ≥1 fall during follow-up. For predicting ≥1 fall, area under the curve (AUC) values ranged from 0.561 [95% confidence interval (CI) = 0.51-0.61] for SLS to 0.593 (95% CI = 0.50-0.69) for gait speed. For ≥2 falls, AUCs ranged from 0.581 (95% CI = 0.52-0.64) for TUGcog to 0.639 (95% CI = 0.54-0.74) for gait speed and for injurious falls from 0.620 (95% CI = 0.54-0.70) for TUGcog to 0.70 (95% CI = 0.54-0.86) for gait speed. Using the WFG algorithm without mobility tests deemed 282 participants as low risk, 41% of whom fell; adding mobility tests to the algorithm increased this proportion to 56%.

Conclusion and relevance: Common balance and mobility tests showed limited predictive validity for future falls. Incorporating these tests into the WFG algorithm did not improve fall risk stratification in community-dwelling older adults.

Keywords: ageing; community dwelling; criterion validity; falls; functional tests; injury; measurement properties; older people; performance-based tests; physical tests; postural control; practice guidelines; psychometric.

The effectiveness of a nation-wide implemented fall prevention intervention in the Netherlands in reducing falls and fall-related injuries among community-dwelling older adults with an increased risk of falls: a randomized controlled trial

van Gameren M, Voorn PB, Bossen D, Frazer SWT, Bosmans JE, Visser B, Pijnappels M. BMC Geriatr. 2026 Jan 24

DOI: 10.1186/s12877-025-06967-6 **PMID:** 41580594

Abstract

Background: Fall prevention programs have been proven effective in reducing falls and fall-related injuries in specific target groups and settings. However, implementing these programs on a larger scale often requires adjustments for feasibility. This study assessed the effectiveness of the nationally implemented In Balance fall prevention intervention compared to usual care in community-dwelling older adults.

Methods: In this single-blinded randomized controlled trial, 264 non- and pre-frail adults of 65 years or older with an increased fall risk were recruited from eleven centers. The intervention group followed an adapted nation-wide 14-week group In Balance program, including educational sessions and Tai Chi-based balance and strength exercises, delivered by trained therapists. The control group received general physical activity recommendations. Primary outcomes were the number of falls and fall-related injuries over 12 months, recorded via fall diaries and follow-up calls. Secondary outcomes included balance, mobility, and general health. Data were analysed using generalized linear- and mixed-effects models, with multiple imputation for missing data. To obtain a difference in the number of falls per year between the intervention and control groups of 50%, 106 participants per group were required, increased to 264 to account for dropout.

Results: The mean age was 75.2 (SD 5.6) years in the intervention and 75.7 (SD 5.1) years in the control group ($p > 0.05$). The mean number of falls per person over 12 months was not statistically different between the intervention and control group (1.67 (SE 0.24) and 1.98 (0.37), respectively; incidence rate ratio 0.85 (95% CI 0.51–1.43)), nor the mean number of fall-related injuries (0.70 (SE 0.11) and 0.97 (0.18), respectively; incidence rate ratio 0.73 (95% CI 0.44–1.19)). Secondary outcomes also showed no significant differences between groups, frailty status and over time. Attendance averaged 15.5 of 24 sessions.

Conclusion: The adapted In Balance program did not significantly reduce falls, injuries, or improve secondary outcomes compared to usual care. The implemented In Balance program appears to be less effective than a priori assumed, possibly due to limited adherence in practice or insufficient frequency and duration of the program.

Keywords: Accidental falls; Ageing; Implementation; Intervention studies; Physical therapy.

Remote exercise snacking and fall-related functional outcomes in older adults: a systematic review including a meta-analysis

Zhang S, Wang M, Lin R, Shuai Z, Lv Z, Wang C, Zhang R, Yang T, Wang Y, Zhang X. Front Physiol. 2026 Feb 11;17:1709619.

DOI: 10.3389/fphys.2026.1709619 **PMID:** 41755895 **PMCID:** PMC12932249

Abstract

Background: Falls are a leading cause of injury and death among older adults, yet many encounter barriers to engaging in conventional exercise programs. Remote exercise snacking (ES) refers to performing multiple (≥2 times) short bursts (≤10 min) of exercise of any type or intensity daily in a non-laboratory setting (including multiple sets of interval training), with complete rest or at least a 30-min recovery period between each exercise session, this represents a flexible alternative; however, its effectiveness remains inconclusive. This study addresses an important evidence gap by systematically evaluates the impact of remote exercise snacking on lower-limb muscle performance, balance ability, as well as its acceptability and feasibility in older adults.

Methods: A systematic search was conducted in six databases (CINAHL, PubMed, Scopus, Cochrane Library, Web of Science and FMRS) from inception to May, 2025. Two reviewers independently performed study selection, data extraction, and risk of bias assessment following PRISMA guidelines. Studies meet the following eligibility criteria in accordance with PICOS, participants were insufficiently active older adults; intervention involved short bouts of exercise; comparator/control were no specific intervention; the primary outcomes was lower-limb muscle function, with secondary outcomes included balance and/or participant adherence or acceptbility; and study design were randomized crossover or randomized control only. Muscle performance and balance outcomes were synthesized through meta-analysis using Stata v15.1 with standardized mean difference (SMD), while adherence and acceptability were evaluated narratively.

Results: Four publications comprising ten studies (n = 313, M/F: 170/143) were included. Remote exercise snacking significantly improved lower-limb muscle strength (SMDpooled = 0.29, 95% CI: 0.06-0.52, p = 0.01) and endurance (SMDpooled = 0.24, 95% CI: 0.01-0.46, p = 0.04), but showed no significant effect on balance (SMDpooled = 0.04, 95% CI: -0.14-0.23, p = 0.65). Subgroup analyses showed that greater improvements in strength were observed in interventions lasting 6 weeks or longer and in those that incorporated progression strategies. The overall mean adherence across the included studies was 85%, with adherence generally higher in interventions that provided video-based guidance.

Conclusion: Remote exercise snacking appears effective in improving lower-limb muscle function but shows limited impact on balance among healthy older adults. Intervention duration and the inclusion of progression are key determinants of efficacy. The delivery mode (e.g., written materials, video, or app-based platforms) and exercise type (e.g., bodyweight, Tai Chi, or combined formats) may influence the acceptability and feasibility of implementation. The main findings are summarized in a graphical abstract.

Systematic review registration: Identifier CRD42024627584.

Keywords: exercise snack; fall-related; meta-analysis; older adults; remote.

Falls Research – February

Effectiveness of Mobile Health Application-Based Interventions for Fall Prevention in Community-Dwelling Older Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Bindawas SM, Vennu V, Almarwani M, Alsaleh HM, Alsaad SM. Sensors (Basel). 2026 Jan 28;26(3):864.

DOI: 10.3390/s26030864 **PMID:** 41682379 **PMCID:** PMC12899110

Abstract

Falls are a leading cause of morbidity and loss of independence among community-dwelling older adults. Mobile health (mHealth) application (app)-based interventions have emerged as a scalable approach to fall prevention. However, evidence from individual trials remains fragmented, underscoring the need for a comprehensive quantitative synthesis. This systematic review and meta-analysis examined whether mHealth app-based interventions reduce fall incidence and improve fall-related risk factors. A systematic search of PubMed, EMBASE, CENTRAL, and Web of Science identified randomized controlled trials meeting predefined eligibility criteria. Nine trials comprising 3437 participants were included, with dual-independent data extraction, quality appraisal, and assessment of evidence certainty. Compared with usual care or control conditions, mHealth app-based interventions reduced fall risk by 11% over 12 months (risk ratio 0.89, 95% CI 0.81-0.98), corresponding to an absolute risk reduction of 6.6%. The pooled reduction in fall rate, however, did not reach statistical significance. Secondary analyses showed moderate improvements in balance, strength, and mobility, a significant decrease in fear of falling, and no serious adverse events. Overall, mHealth app-based interventions provide modest but meaningful benefits and may complement comprehensive fall-prevention strategies for older adults.

Keywords: community-dwelling older adults; falls prevention; mHealth app.

Determining the burden of falls amongst community-dwelling older people in Ireland to inform falls care delivery: secondary data analysis from the Irish longitudinal study on ageing - the defined study

Briggs R, Ward M, Scarlett S, van der Velde N, Hernandez B, Romero-Ortuno R, Tysinger B, May P, Ahern E, Kenny RA. BMJ Open. 2026 Jan 30;16(1):e107647.

DOI: 10.1136/bmjopen-2025-107647 **PMID:** 41617230 **PMCID:** PMC12863362

Abstract

Objective: Falls represent the most frequent reason older people are admitted to hospital and significantly increase the likelihood of functional decline, healthcare utilisation and early mortality. The aim of this study is to comprehensively delineate the burden of falls amongst community-dwelling older people in Ireland.

Design: Population-representative analysis of Wave 6 of the Irish Longitudinal Study on Ageing (TILDA) estimating incidence of falls requiring medical attention and emergency department (ED) attendance, fractures and fear of falling over 12 months. Additional data detailing falls-risk increasing drugs (FRIDs) and prior falls were also analysed.Using Central Statistics Office Census 2022, the population of older people in Ireland was multiplied by the proportion of TILDA participants with each outcome of interest to yield population-level estimates.

Participants/setting: Population-representative sample of 2299 (55% female) community-dwelling people in Ireland aged ≥70 years.

Results: Almost 12% (proportion 0.12 (95% CI 0.10 to 0.13)) of participants, corresponding to almost 62 000 older people in Ireland, reported a fall requiring medical attention in 12 months, with 6% (proportion 0.06 (95% CI 0.05 to 0.07)), or over 32 000 people, attending ED due to a fall. Over 3% (proportion 0.03 (95% CI 0.03 to 0.04)) reported sustaining a fracture. Almost half of participants reporting a fall requiring medical attention were prescribed FRIDs, and over half had also reported a fall when assessed at the prior wave of the study (ie, 2 years ago).

Conclusions: The burden of falls amongst community-dwelling older people is considerable; 1 in 8 required medical attention for a fall and 1 in 16 attended the ED with falls over 12 months.Currently, there is no national falls strategy in Ireland. These findings, alongside our ageing population, underscore the need for strengthened falls-prevention strategies to reduce avoidable morbidity and healthcare utilisation.

Keywords: Aged; Frailty; GERIATRIC MEDICINE.

Feasibility, safety, and effects of a step training program in community-dwelling older adults with mild-to-moderate dementia: A feasibility wait-list controlled trial

Chan WLS, Liu JQJ, Lam FMH, Cheung DSK. J Alzheimers Dis. 2026 Feb 24:13872877261422508.

DOI: 10.1177/13872877261422508 **PMID:** 41736222

Abstract

Background

Stepping performance is a strong determinant of falls in older adults. Step training has been shown to be effective in improving fall-related outcomes in healthy older adults. However, step training has not been investigated in older adults with dementia.

Objective

This study evaluates the feasibility, safety, and effects of a step training program in community-dwelling older adults with mild-to-moderate dementia.

Methods

Participants were assigned to either a step training group or a wait-list control group. The step training group performed two 40-min exercise sessions per week, each consisting of a 5-min warm-up, 30 min of stepping exercises, and a 5-min cool-down, for 12 weeks. The control group received usual care during this time. The training involved repeatedly stepping onto specific targets on a plastic mat. The exercise intensity was progressed by increasing stepping distance and task complexity once participants could accurately complete the required steps. Feasibility, assessed as the percentage of participants completing the 12-week follow-up, safety, defined as the incidence of adverse events, and clinical outcomes were assessed.

Results

Forty-seven participants (84%) completed the 12-week assessment. No adverse events were recorded. Significant improvements in choice stepping reaction time ($p = 0.038$), maximum step length [left leg backward stepping ($p = 0.046$) and side stepping ($p = 0.020$)], and alternate stepping time ($p = 0.002$) were found in the step training group compared to the control group.

Conclusions

The step training program was feasible, safe, and potentially effective in improving the stepping performance of older adults with mild-to-moderate dementia.

Keywords: Alzheimer's disease; balance; cognitive training; exercise; falls.

Non-contact radar assessment of One-Legged Stand Test for fall risk in aging

Copeland D, Zhang X, Linton E, Mori B, Namburi P, Anthony BW. Gait Posture. 2026 Feb 9;126:110108

DOI: 10.1016/j.gaitpost.2026.110108 **PMID:** 41687572

Abstract

Background: Falls are a leading cause of morbidity and mortality in older adults, requiring better longitudinal assessment tools. While established clinical methods such as the One-Legged Stand Test (OLST) are effective, they rely on supervised, contact- or video-based systems and are typically performed only annually, missing changes in fall risk between visits.

Objective: We evaluated a privacy-preserving Frequency-Modulated Continuous Wave (FMCW) radar system's ability to autonomously proctor the OLST and assess postural instability during the test, compared with simultaneously collected gold-standard measurements of force plates and motion capture (MOCAP).

Methods: In a cross-sectional study of 32 healthy adults (15 young ≤32 y, 17 older ≥64 y), synchronized radar, force plate, and motion capture data were collected during short (4 s) and long (20 s) OLST trials. A convolutional neural network-long short-term memory-attention (CNN-LSTM-Attention) model was trained on radar-derived range-Doppler maps to classify OLST phases, with performance evaluated against force plate and MOCAP ground truth. All de-identified data and visualization code are publicly available on PhysioNet.

Results: The model detected Foot-Up (FU) and Foot-Down (FD) events with 94.0% and 90.7% accuracy, respectively, improving to 96.9% and 94.5% after logical post-processing. In long trials, radar-derived Doppler wobble metrics during the stability phase strongly correlated with OLST duration (R^2=0.58, p<0.001), and aligned with similar trends in force plate (COP ellipse area, R^2=0.72, p<0.001) and MOCAP (trunk pitch-period IQR, R^2=0.65, p<0.001) metrics. In short trials, radar-derived features separated the three study-defined cohorts, with significant pairwise differences (p<0.05) and large effect sizes (d=1.13-2.72).

Conclusion: FMCW radar accurately detects OLST transitions and captures wobble signatures linked to neuromuscular control and fall risk. These findings establish proof-of-concept for non-contact radar assessment of balance in older adults and support further clinical validation for at-home monitoring.

Keywords: Aging population; Balance control; FMCW radar; Fall risk assessment; Non-contact monitoring; One-Legged Stand Test.

Comparison of plantar pressure distribution, balance and functional parameters in older adults with high and low fall risk: a cross-sectional study

Gerdan H, Kesikbaş Kurt G, Üstünbaş Atmaca G, Yılmaz K, Bek N. Ir J Med Sci. 2026 Feb 24.

DOI: 10.1007/s11845-026-04286-2 **PMID:** 41733890

Abstract

Background

Falls are a common and serious problem among older adults, often leading to injury and functional decline. Understanding plantar pressure patterns and functional performance can help identify fall risk mechanisms.

Aims

This study aimed to compare plantar pressure distribution, balance, and functional parameters in older adults with high and low fall risk.

Methods

Twenty-nine older adults (mean age 72.76 ± 5.23 years) participated. Participants were divided based on Berg Balance Scale scores: high fall risk (n = 15) and low fall risk (n = 14). Static and dynamic plantar pressures were assessed using pedobarography. Functional mobility and balance were evaluated with the Functional Reach Test (FRT), Timed Up and Go Test (TUG), and 10-Meter Walk Test (10MWT).

Results

No significant differences were observed in static plantar pressure parameters. In dynamic analysis, non-dominant forefoot impulse was significantly higher in the low fall-risk group (p = 0.032), while dominant midfoot impulse was lower in the low fall-risk group (p = 0.041). Low-risk participants reached longer distances in FRT (p = 0.001) and completed TUG faster (p = 0.010), indicating better functional performance. 10MWT performance was better in the low-risk group but not statistically significant (p = 0.085).

Conclusions

Static plantar pressure parameters did not differ significantly between groups, but dynamic plantar pressure and functional tests did. Better FRT and TUG performance and higher non-dominant forefoot impulse were observed in the low-risk group. Evaluating fall risk should incorporate balance, time-dependent plantar pressure, and functional performance, guiding intervention strategies.

Emergency Department Visit Outcomes of a Multicenter Randomized Trial of a Fall Prevention Intervention

Goldberg EM, Keene S, Bounds M, Resnik L, Berry SD, Roberts S, Leroux A, Gomez-Picazo J, Magdaleno M, Nelson A, Mor V, Merchant RC. Acad Emerg Med. 2026 Jan;33(1):e70228

DOI: 10.1111/acem.70228 **PMID:** 41603307

Abstract

Background: Emergency department (ED) visits by older adults for falls are an opportunity to initiate fall prevention interventions. The GAPcare II trial tested an effective ED-based fall prevention program at two health systems. Our objective was to assess successful completion of intervention processes across sites including consultation completion rates, time to consultation, consultation duration, and types of recommendations made.

Participants and setting: Community-dwelling adults ≥ 65 years old presenting to three EDs (two in Rhode Island, one in Colorado) within 7 days of an accidental fall who were expected to be discharged and were without mobility-limiting injuries.

Methods: GAPcare II was a randomized controlled trial conducted from August 2021 to January 2025. Participants were randomly assigned to intervention (pharmacy and physical therapy (PT) consultations) or usual ED care arms. Pharmacists reviewed medications for fall risk and recommended modifications. Physical therapists performed validated mobility/balance assessments and provided recommendations for assistive devices, outpatient services, and disposition.

Results: Of 852 eligible ED patients, 196 were enrolled (96 intervention, 100 control). Participants' median age was 78 years, 68% were female, and 83% were white. In the intervention arm, 93% received pharmacy consultations and 83% received PT consultations. Median time from initial consultation request to bedside evaluation was 24 min (pharmacy) and 47 min (PT). Pharmacists recommended changing medication timing (26%), stopping fall-risk medications (19%), and dose adjustments (18%). Physical therapists recommended assistive devices (66%), outpatient services (36%), and skilled nursing facility admission (25%). ED length of stay did not differ between the intervention and usual care arms (4.6 vs. 4.4 h, p = 0.90).

Conclusions: The GAPcare II trial demonstrated that an ED-based fall prevention program is feasible to implement across two health systems with varied operations, volume, and staffing with similar results. Consultations generated actionable recommendations and did not prolong ED length of stay.

Association between backward walking speed and physical balance and fall risk in community-dwelling older adults

Gong Z, Chen C, Wang L, Tanigawa R, Harayama E, Li S, Kishimoto H. Geroscience. 2026 Feb 17.

DOI: 10.1007/s11357-026-02149-3 **PMID:** 41703240

Abstract

Backward walking is increasingly recognized as an alternative task for detecting balance deficits and fall risk in older adults. However, its utility as a functional indicator in healthy populations remains underexplored. This study aimed to investigate the potential associations between the backward walking speed (BWS), physical balance, and fall risk in community-dwelling older adults. In this cross-sectional study, 90 community-dwelling older adults were recruited. Self-selected backward walking speed (SBWS) was assessed together with the Berg Balance Scale (BBS), the Performance-Oriented Mobility Assessment (POMA), and the Fall Risk Index (FRI). Grip strength and cognitive function, evaluated using the Montreal Cognitive Assessment (MoCA), were also measured as covariates. Fear of backward walking (FoBW) was investigated using a self-administered questionnaire prior to the walking tests. Pearson correlation and multiple regression analyses were performed to examine the associations between SBWS, physical balance, and fall risk. The data of 84 participants (mean ± SD age 75.7 ± 5.0 years) were analyzed. Their mean forward and backward walking speeds were 1.36 ± 0.23 m/s and 0.73 ± 0.24 m/s, respectively. The SBWS showed moderate correlations with the Timed Up and Go (TUG) test (r = -0.52), forward speed (r = 0.49), and grip strength (r = 0.41), and weaker correlations with the BBS (r = 0.38), MoCA (r = 0.23) and FES-I (r = -0.34) . No statistically significant correlations were found between SBWS and POMA-Total (r = 0.20), FRI (r = 0.09). In adjusted regression models, SBWS was significantly associated with higher BBS scores (β = 3.744, p = 0.023) and lower TUG times (β = -1.488, p = 0.029) but not with the POMA-Total (β = 1.052, p = 0.344) or FRI (β = 3.001, p = 0.096). BWS may serve as a multidimensional indicator of physical and psychological vulnerability in older adults. Longitudinal studies with dynamic or dual-task assessments are necessary to validate its predictive value for fall risk screening.

Keywords: Backward Walking; Community-dwelling older adults; Fall risk; Postural control.

Feasibility of the MAINTAIN intervention to support independence after a fall for people with dementia: a pilot cluster randomised controlled trial in participants' own homes

Greene L, Connors J, Hulme C, Ukoumunne OC, Barber R, Bingham A, Conroy S, Fox C, Duff C, Goodwin V, Gordon AL, Hall AJ, Harwood RH, Jackson T, Litherland R, Morgan-Trimmer S, Parry SW, Sharma A, Whale B, Allan L. BMJ Open. 2026 Feb 10;16(2):e112336

DOI: 10.1136/bmjopen-2025-112336 **PMID:** 41667169

Abstract

Objectives: To evaluate the feasibility of conducting a full-scale randomised controlled trial to assess the clinical and cost-effectiveness of the MAINTAIN intervention, designed to support recovery and independence following a fall among people living with dementia.

Design: Pilot cluster randomised controlled trial (c-RCT).

Setting: Community-based healthcare services across six UK sites representing primary and secondary care settings.

Participants: 31 participant-carer dyads were recruited. Eligibility criteria included a diagnosis of dementia and a recent fall. Exclusion criteria included severe comorbidity precluding participation. The consent rate was 84%, and retention at follow-up was 81%.

Interventions: The MAINTAIN intervention comprised tailored, home-based therapy sessions delivered by trained professionals, focusing on functional recovery, confidence and re-engagement in daily activities, compared with usual care. The intervention was delivered over 12 weeks with booster sessions up to week 24, with the full trial period lasting 28 weeks.

Primary and secondary outcome measures: Feasibility outcomes included recruitment and retention rates, intervention adherence and data completeness for outcome and economic measures. Exploratory outcomes assessed functional performance and quality of life. Feasibility outcomes were assessed at baseline, 12 weeks and 28 weeks.

Results: Recruitment occurred over an 8-month period (September 2023-April 2024) across six UK sites. Most intervention participants (89%) attended at least 60% of planned sessions. Completion rates for outcome and economic data were high, indicating strong acceptability and feasibility of both the intervention and trial procedures.

Conclusions: The pilot c-RCT demonstrated that recruitment, retention and intervention delivery were feasible and well accepted. Findings support progression to a definitive trial to evaluate the effectiveness and cost-effectiveness of the MAINTAIN intervention.

Trial registration number: ISRCTN16413728 (International Standard Randomised Controlled Trial Number registry).

Keywords: Aged; Aged, 80 and over; Aging; Dementia; Frail Elderly; Rehabilitation medicine.

Steps Toward Safety: A Guide to Pharmacy Student-Led Fall Prevention

Hurst M, Ibrahim L, Alqahtani ZA, Brown B. J Foot Ankle Res. Sr Care Pharm. 2026 Feb 1;41(2):45-52

DOI: 10.4140/TCP.n.2026.45 **PMID:** 41699422

Abstract

Background Community-dwelling older adults are at an increased risk of falls for multiple reasons. Community-based initiatives are needed to prevent these devastating events.

Objectives This observational cohort study evaluated community fall-prevention events led by pharmacists and student pharmacists. The primary outcome was the change in Stopping Elderly Accidents, Deaths, and Injuries (STEADI) score among participants aged 55 years and older. Secondary outcomes included participant-reported changes in the number of fall hazards in the home, the number of medications taken by participants that increase fall risk as recorded during the community event, and participants' confidence in performing the chair-rise exercise after the community event.

Methods The fall-prevention events included education on fall risk, prevention strategies, identification of home fall hazards, review of high-risk medications, and instruction on safely rising from a chair.

Results The change in STEADI assessment scores from before compared to 30 days after attending the community event was significant ($P < 0.0001$). Participants identified an average of 2 (± 1.5) home fall hazards after the community event, and 92.6% made changes to their home environment. Participants also reported taking an average of 2 (± 1) high-risk medications at the community event and demonstrated significantly improved confidence in their ability to safely rise from a chair post-activity ($P = 0.0005$).

Conclusion Pharmacist- and student pharmacist-led fall prevention events decreased fall risk, as evaluated by the STEADI assessment. Participants were encouraged to make changes to their home environment, received education about high-risk prescription and over-the-counter medications, and demonstrated increased confidence in performing the chair-rise exercise. Overall, these findings demonstrate that pharmacist-led community outreach events can lead to meaningful behavioral changes to help prevent falls in older adults.

Acceptability of Minimalist Shoes Compared With Balance-Enhancing Shoes in Older Women: Protocol for a Randomised Crossover Trial

Nor Azhar A, Bergin SM, Munteanu SE, Menz HB. J Foot Ankle Res. 2026 Mar;19(1):e70129

DOI: 10.1002/jfa2.70129 **PMID:** 41671074 **PMCID:** PMC12893392

Abstract

Introduction: Falls are a major concern for older women and can result in significant injury. Footwear has been shown to improve or impair balance performance in older women, contingent upon footwear design features. Balance-enhancing shoes may reduce the risk of falling but their acceptability is unknown. Acceptability is important because it influences the level of adherence to the intervention. The aim of this trial protocol is to describe the methodology of a randomised crossover trial to compare the acceptability of balance-enhancing outdoor shoes versus minimalist outdoor shoes in older women and compare the effects of these two interventions on the perceived risk of falling and balance performance.

Methods: The trial will use a randomised two-period crossover trial methodology. We will recruit 44 community-dwelling women aged 65 years or older who will be randomised to receive a pair of minimalist shoes (Basic Lace Up Canvas Shoes, Kmart Australia Ltd, Mulgrave, Australia) or a pair of balance-enhancing shoes (Balla Balance Leather Lace Up Boots, Ziera Australia, Abbotsford, Australia), which encompass key features known to be beneficial for balance such as adequate fixation, a firm heel counter, high heel collar, firm midsole and textured insole. The order of the interventions will be randomised. Cross-over to the second shoe condition will occur at 6 weeks. Outcome measures will be collected at baseline, six and 12 weeks; the primary endpoint for assessing footwear acceptability for each shoe condition will be 6 weeks. The primary outcome measure will be footwear acceptability, evaluated using a modified version of the Monitor Orthopaedic Shoes Questionnaire. Secondary outcome measures include perceived risk of falling (the Falls Efficacy Scale International) and balance performance (upper body stability when walking, using the GyKo wearable sensor).

Discussion: This trial will evaluate the acceptability, perceived risk of falling and balance performance of minimalist shoes versus balance-enhancing shoes. The findings will provide much-needed evidence as to the acceptability of these two shoe types in older women. Such information may support footwear design to increase balance performance and reduce risk of falling.

Trial registration: Australian and New Zealand Clinical Trial Registry (ACTRN12624001496505).

Keywords: accidental falls; clinical trial protocol; postural balance; shoes.

Investigation of the relationship between pain, fear of movement and falling in geriatric patients

Öztürk ÜM, Polat M. PeerJ. 2026 Feb 9;14:e20661

DOI: 10.7717/peerj.20661 **PMID:** 41695689 **PMCID:** PMC12897346

Abstract

Background: Falls among older adults represent a major public health concern and are strongly associated with pain, fear of falling, and fear of movement. Pain may increase fall risk in a dose-response manner, while fear of falling can limit mobility, further enhancing vulnerability. This study aimed to investigate the interrelationship between pain, kinesiophobia, and fear of falling in geriatric patients.

Methods: A descriptive cross-sectional study was conducted in the Physical Therapy Unit of Burdur State Hospital, Turkey, between March 2022 and March 2023. A total of 100 participants aged ≥65 years were recruited by random sampling. Data collection included sociodemographic characteristics, fall history, chronic diseases, and regular medication use. Pain was assessed using the Visual Analog Scale (VAS) and Verbal Category Scale, kinesiophobia using the Tampa Kinesiophobia Scale, and fear of falling using the Tinetti Falls Efficacy Scale. Data were analyzed using Statistical Package for the Social Sciences (SPSS version 23). Descriptive statistics, Student's *t*-test, analysis of variance (ANOVA) with Tukey *post-hoc*, and Pearson correlation analyses were performed.

Results: The mean age of participants was 70.6 ± 4.5 years. The difference in VAS scores between genders was statistically significant ($p < 0.05$), with higher pain levels in women. A strong positive correlation was found between the Tampa and Tinetti scores ($r = 0.704$, $p < 0.01$), and a moderate positive correlation was observed between VAS and Verbal Category Scale scores ($r = 0.535$, $p < 0.01$). Other subgroup comparisons by education, marital status, and chronic disease were not statistically significant.

Conclusions: Pain, kinesiophobia, and fear of falling are interrelated in older adults and negatively affect daily functioning. Routine assessment of these factors is essential for personalized fall-prevention strategies. Interventions that encourage safe mobility and reduce fear of movement may improve quality of life in the geriatric population.

Keywords: Age; Fear of falling; Fear of movement; Pain.

Association of Fall-Risk Factors and Margin of Stability While Tripping in Community-Dwelling Older Adults: Experimental Pilot Study

Sczuka KS, Schneider M, Kerse N, Becker C, Klenk J. JMIR Form Res. 2026 Feb 5;10:e74418

DOI: 10.2196/74418 **PMID:** 41643136 **PMCID:** PMC12875566

Abstract

Background: Falls are a leading cause of injury among older adults, often resulting from dynamic balance disturbances. It is influenced by a complex interplay of intrinsic and extrinsic fall-risk factors. To identify individual fall risks, it is important to understand the underlying associations.

Objective: This study aimed to build an experimental setup modeling selected factors leading to a loss of balance, measured by the margin of stability (MoS) in an ecologically valid real-world example (tripping). Additionally, these analyses aimed to assess the feasibility and safety of the protocol and to explore the use of the MoS as part of a prototypical dynamic fall-risk model to differentiate between fall-risk groups.

Methods: Nineteen community-dwelling older adults (mean age of 71, SD 3.67 y; n=7, 37% women) completed the tripping protocol involving perturbations under various conditions. Clinical assessments were used to identify relevant fall-related intrinsic fall-risk factors. MoS was measured using an 8-camera motion capture system. Receiver operating characteristic analyses determined the ability of MoS to distinguish between low and high fall-risk groups.

Results: Approximately one-quarter of participants discontinued before or at the start of the tripping scenario because of discomfort or fear of perturbations, indicating that perceived safety is an important feasibility factor. Perturbations significantly disrupted MoS, with a median MoS of -106.05 (IQR -181.40 to -41.50) mm during the perturbed step compared to 114 (IQR 81.20-155.20) mm in the preperturbation step. Recovery steps showed progressive stabilization, with the second recovery step achieving a median MoS of 88.45 (IQR 47.50-137.80) mm. The second recovery step exhibited the highest predictive accuracy for fall-risk differentiation, with area under the curve values reaching 82.3% during slow walking with a series of right-sided perturbations. In contrast, fast walking with random perturbations yielded lower area under the curve values (64.9%). Slow walking conditions generally demonstrated the clearest separation between fall-risk groups.

Conclusions: This pilot and feasibility study demonstrates the applicability of a tripping paradigm to perturb MoS in older adults and provides preliminary insights into its association with fall-risk indices. While the protocol proved safe and feasible for fit older adults, perceived safety limited full participation. The findings are exploratory and intended to guide the design of larger prospective studies rather than to establish predictive conclusions. These data suggest that MoS during controlled tripping may help differentiate fall-risk strata, but confirmation will require adequately powered studies in more diverse and frailer older populations-and across multiple real-world scenarios-before any clinical implementation can be considered.

Keywords: dynamic balance; fall risk; fall risk factor; fall-related activity; laboratory setting; margin of stability.

Effect of Yoga Practices on Postural Stability, Fall Risk, and Psychological Wellbeing in Older Adults

Shete S, Verma A, Bhogal RS, Tiwari S. Geriatrics (Basel). 2026 Feb 5;11(1):16

DOI: 10.3390/geriatrics11010016 **PMID:** 41718364 **PMCID:** PMC12922125

Abstract

Background: Advancing age is frequently associated with balance impairment, increased fall risk, and psychological distress, which together contribute to loss of independence and reduced quality of life. Yoga, as a mind-body practice, has the potential to enhance physical stability as well as mental well-being in older adults. Therefore, the objective of this study was to evaluate the effects of a structured yoga program on balance, fear of falling, mobility, and mental health outcomes among older adults.

Methods: A quasi-experimental pretest-post-test study was conducted at Nagpur, India. A total of 64 eligible participants (65-85 years) were purposively assigned to a yoga intervention group (n = 32) or a waitlist control group (n = 32). The 12-week intervention comprised preparatory exercises, yoga postures, breathing practices, and meditation. Outcomes assessed at baseline and post-intervention included balance, fear of falling, mobility, depression, and anxiety.

Results: Data from 50 participants (yoga: n = 26; control: n = 24) were analyzed. The yoga group showed significant improvements in balance ($p < 0.001$) and functional mobility ($p < 0.001$), with significant reductions in fear of falling ($p = 0.009$), anxiety ($p = 0.0003$), and depression ($p = 0.004$). In contrast, the control group exhibited deterioration in functional mobility ($p = 0.001$) and anxiety ($p = 0.009$), with no significant gains in other measures. Between-group comparisons confirmed significantly greater improvements in the yoga group across all outcomes.

Conclusions: A 12-week yoga program was feasible and effective in improving balance, functional mobility, and mental health, while reducing fear of falling among older adults. Yoga may serve as a safe, non-pharmacological intervention to promote healthy aging in institutionalized populations.

Trial registration: This study was prospectively registered with the Clinical Trial Registry of India (Registration No: CTRI/2023/10/058682; Registered on: 16 October 2023).

Keywords: anxiety; balance; depression; falls; functional mobility; mental health; older adults; yoga.

Effectiveness and Cost-Effectiveness of a Digital Falls Prevention Program Versus Usual Care to Improve Balance, Falls Risk, and Function in Older Adults: Protocol for the Keep-On-Keep-Up Randomized Controlled Trial

Stanmore E, Parchment A, Odebiyi B, Bower P, French C, Shi C, Bashir S, Ahmed S, Dowding D, Dumville J, Kislov R, Thompson A, Skelton DA, Clarke M, Todd C. JMIR Res Protoc. 2026 Feb 5;15:e78840

DOI: 10.2196/78840 **PMID:** 41643062 **PMCID:** PMC12875423

Abstract

Background: Falls are the primary cause of fatal and nonfatal accidental injuries in older adults. The World Falls Prevention Guidelines recommend balance-challenging, functional exercise programs as a key strategy for falls prevention, but access, uptake, and adherence to these programs in community settings remain suboptimal. Keep-On-Keep-Up (KOKU), a digital, National Health Service-approved program, was codeveloped with older adults and therapists to provide progressive, evidence-based exercises and to raise awareness of falls prevention strategies.

Objective: This trial aims to investigate the effectiveness and cost-effectiveness of the KOKU digital strength and balance program for improving balance, enhancing physical function, and reducing falls risk among community-dwelling older adults.

Methods: This is a 2-arm, parallel-group randomized controlled trial. A total of 196 community-dwelling older adults 60 years and older will be randomized to either the intervention group, comprising a digital strength and balance program (KOKU) alongside standard care (strength and balance exercise advice and a falls prevention leaflet), or to a control group, receiving standard care only. Participants receiving the intervention will be asked to exercise 3 times per week following the tailored and progressive program. Randomization will take place after recruitment and baseline data collection. The trial's primary outcome measure is balance function (Berg Balance Score) at 12 weeks post randomization. Secondary trial outcomes include lower limb strength, health care utilization and health-related quality of life, self-reported concerns about falling, self-reported physical activity, falls risk, pain, mood, fatigue, self-reported falls, and acceptability and usability of the KOKU program. Intention-to-treat analysis and a cost-effectiveness analysis will be employed for trial data analysis. Qualitative interviews and focus groups will be undertaken with around 10 care providers and 13 participants to further understand views of the intervention and trial processes.

Results: This study began recruitment in July 2024 and concluded in March 2025, recruiting a total of 202 participants (102 intervention group and 100 control group). Following protocol publication, data compilation and analysis will be conducted, with results anticipated to be published in 2027.

Conclusions: This trial will provide important evidence on whether a digital strength and balance program can improve balance and related outcomes in older adults compared with usual care.

Keywords: accidental falls/prevention; aged; digital health intervention; mobile apps; postural balance; randomized controlled trial.

The relationship between muscle strength, balance and falls in elderly postmenopausal osteoporosis patients

Yakaryılmaz FD, Yıldırım AM, Öztürk ZA. J Clin Densitom. 2026 Feb 6;29(2):101682

DOI: 10.1016/j.jocd.2026.101682 **PMID:** 41762850

Abstract

Objective: Osteoporosis (OP) poses a great risk for falls by causing both a decrease in muscle strength and a loss of balance ability by weakening postural control. In this study, it was aimed to determine the relationship between osteoporosis and falling in a group of older patients and to determine possible predictors that may affect it.

Materials and methods: A total of 106 women aged 65 years and over were included in this cross-sectional study. Anthropometric measurement results, clinical and laboratory data of the participants were obtained from medical files. In addition to comprehensive geriatric assessment tests, Tinetti Balance and Gait Assessment Tool (TBGA) and hand grip strength (HGS) scores and the number of falls in the last year were obtained from the file records of the patients.

Results: A total of 106 (71.2 ± 6.4) older female outpatients, 43 (72.6 ± 7.0) OP, participated in the study. HGS and TBGA scores were lower and the frequency of sarcopenia and probable sarcopenia was higher in the OP group ($p = 0.007$, $p = 0.002$, and $p = 0.015$; respectively). Femoral neck T score was positively correlated with the HGS and lumbar spine T score and negatively correlated with age ($r = 0.369$, $p < 0.001$; $r = 0.556$, $p < 0.001$; $r = -0.329$, $p < 0.001$; respectively). In addition there was a positive correlation between HGS and TBGA ($r = 0.273$, $p = 0.005$).

Conclusion: Older women with osteoporosis demonstrated poorer muscle strength and balance performance and experienced falls more frequently than non-osteoporotic controls. Although several clinical parameters were associated with falls, only age and body mass index remained independently related to fall risk. These findings suggest that simple clinical measures such as handgrip strength and balance assessment may be useful for identifying fall-prone older women with osteoporosis.

Keywords: Balance; Elderly; Falls; Handgrip strength; Osteoporosis.

Perceptions and practices of rehabilitation specialist nurses in fall management: a qualitative study

Zhang H, Luo J, Zhang X, Jiang Y, Sun X, Tang Q, Wang X, Li B. Front Public Health. 2026 Jan 29;14:1749446

DOI: 10.3389/fpubh.2026.1749446 **PMID:** 41694523

Abstract

Introduction: Falls are a critical challenge in rehabilitation nursing, often leading to severe injury and prolonged recovery. Rehabilitation specialist nurses play an essential role in fall prevention; however, they encounter difficulties in accurately identifying risks, personalizing interventions, and collaborating effectively within interdisciplinary teams. This study aimed to explore the perceptions and practices of rehabilitation specialist nurses in fall management and to identify their strategies, challenges, and recommendations for optimizing fall prevention and intervention in rehabilitation settings.

Methods: An exploratory qualitative study was conducted. Semi-structured, face-to-face interviews (30-60 min) were conducted with 20 rehabilitation specialist nurses from tertiary hospitals, each with at least 2 years of fall management experience. A piloted interview guide with four open-ended questions focusing on risk perception, prevention strategies, challenges, and improvement suggestions was used. Data were analyzed via content analysis using NVivo 14 until code saturation was achieved.

Results: Content analysis identified four main themes: (1) specialized nurses' sensitivity to falls; (2) comprehensive fall risk assessment; (3) system-wide participation in fall prevention; and (4) timely evaluation of fall management effectiveness.

Discussion: Rehabilitation specialist nurses were found to contribute significantly to fall prevention through multidimensional assessment and personalized interventions. Integrating rehabilitation specialist nurses' expertise in dynamic functional assessment into standard fall prevention protocols is crucial for improving patient safety. Healthcare institutions should leverage their expertise to establish structured prevention protocols, incorporate real-time monitoring, and promote interprofessional cooperation, thereby enhancing the effectiveness of fall management in rehabilitation settings.

Keywords: fall management; patient safety; qualitative research; rehabilitation nursing; risk assessment.