Featured Falls Research – December

Insomnia symptoms, sleep duration, and risk of falls in older adult women: findings from the Study of Women's Health Across the Nation

Baker JS, Hood MM, Swanson LM, Kline CE, Ylitalo KR, Cauley JA, Green RR, Karvonen-Gutierrez CA. J Gerontol A Biol Sci Med Sci. 2026 Jan 2;81(1):glaf249.

Abstract

Background: As the leading cause of injury and injury-related death for older adults in the United States, falls can be consequential for function and mortality but are preventable. Sleep may be a modifiable risk factor for falls.

Methods: Data from 1795 female participants of the Study of Women's Health Across the Nation (SWAN) were analyzed to examine whether frequent insomnia symptoms and shorter sleep duration are associated with an increased risk of falls or fall burden. At visit 12, assessed insomnia symptoms included frequency of restless sleep, trouble falling asleep, and waking early. Sleep duration was self-reported hours of sleep, dichotomized as fewer than <6 h/night and ≥6 h/night. At visit 15, participants reported the falls in the year prior. Log-binomial and multinomial logistic regression models were adjusted for demographic, health, and socioeconomic factors.

Results: Women who reported frequent (5+ times/week) trouble falling asleep and frequent waking at baseline had a 30% increased risk (aRR = 1.30, 95% CI, 1.04-1.62) and 24% increased risk (aRR = 1.24, 95% CI, 1.03-1.49), respectively, of having fallen in the year prior at follow-up. Frequent trouble falling asleep and short sleep duration (<6 h) were both associated with higher odds of falling 3 or more times vs once or never prior to follow-up (aOR = 2.42, 95% CI, 1.26-4.63; aOR = 1.77, 95% CI, 1.08-2.93), respectively.

Conclusions: Multiple indicators of poor sleep, including trouble falling asleep, frequent waking, and short sleep duration, were associated with an increased risk of falling and odds of higher fall burden in older adult women. Promoting adequate, high-quality sleep may be an essential component in fall prevention.

Keywords: Falls; Insomnia; Older adults; Sleep; Sleep duration.

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Effects of Mobility-Fit, a tailored multicomponent physical activity program with upper-limb emphasis, on strength, mobility and fall risk among older adults in long-term care: a cluster randomised controlled trial

Abstract

Background: Older adults in long-term care (LTC) face accelerated functional decline due to frailty, affecting mobility and quality of life (QoL). Upper-body strength is crucial for daily activities and injury prevention, yet conventional physical activity (PA) programs often overlook it. This cluster randomised controlled trial evaluated Mobility-Fit, a 12-week multicomponent PA program emphasising upper-limb and core strength among LTC residents.

Methods: Twenty LTC facilities were randomised into the Mobility-Fit (10 facilities, n = 73) or control (10 facilities, n = 73) group. Mobility-Fit included agility, balance and resistance exercises (3 times/week, 45 minutes), tailored to participants' functional capacity. The control group received standard care with lower-limb exercises, delivered with the same frequency. Outcomes included upper- and lower-limb strength, postural sway, reaction time, mobility (Short Physical Performance Battery), frailty (FRAIL-Nursing Home), fall risk (Longitudinal Aging Study Amsterdam fall risk profile questionnaire, LASA) and QoL [EuroQol (EQ)-5D]. An intention-to-treat analysis with generalised estimating equations was conducted.

Results: Participants (median age = 86, 60% female) exhibited high adherence (83.3%). Mobility-Fit demonstrated superior improvements in elbow extension strength [β = 0.50, 95% confidence interval 0.26-3.89] and QoL (EuroQol five-dimension questionnaire utility: β = 0.17, P < .001; EQ-Visual Analogue Scale: β = 7.13, P = .006). Both groups improved lower-limb strength (knee extension: β = 2.72, P < .001) and mobility (Sit-To-Stand time: β = -3.69, P < .001), with a reduced LASA score (β = -1.20, P < .001).

Conclusions: Mobility-Fit effectively enhanced upper-limb strength and QoL in LTC residents. Both groups showed improvements in lower-limb strength and mobility, highlighting the universal benefits of structured PA. The program addresses a critical gap by demonstrating the value of integrating upper-body training into standard care to promote holistic well-being.

Keywords: care home; exercise; older people; quality of life; safe mobility; strength.

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Falls Research – December

Effect of 12 Weeks of Hatha Balance Flow Yoga on Fall and Injury Risk in Postmenopausal Women

Arnold CM, Bath B, Prosko S, Crockett K, Farthing J, Lanovaz J. Int J Yoga Therap. 2025 Dec 26;35(2025):Article 11.

Abstract

Postmenopausal women are at an increased risk of falls and fractures. Upper-extremity fractures because of forward falls are common in women in their 50s and 60s, but little research has focused on the potential fall and injury risk factors within this age bracket and ways to mitigate the risks. Yoga is a promising intervention for older women to improve balance, muscle strength, and upper-body reactions for a safer fall landing. The purpose of the present study was to evaluate the effect of 12 weeks of a hatha Balance Flow Yoga class on forward fall and injury risk factors in postmenopausal women. Thirty-six women between the ages of 50 and 70 participated in an intervention study where they were tested at baseline (base), 12 weeks after a control period (pre), and again 12 weeks after participating in the group-based yoga intervention offered twice per week (post). Outcome measures included fall risk factors (balance, balance confidence, lower-body strength, and dual task) and forward fall injury risk factors (upper-body strength, range of motion, and response time). Repeated-measures multivariate analysis of variance found a significant time improvement in fall risk factors and forward fall injury risk factors ($p = 0.004$). Specifically, there was significant improvement in balance (one-leg stand), lower-body strength (30-second sit to stand), and upper-body response time after the intervention. Tailoring yoga classes for older women to focus on improving fall-related risk factors may help to provide effective options to improve their ability to prevent serious consequences of fall-related injury.

The interaction of gait characteristics and concerns about falling in community-dwelling older adults

Britting S, Krumpoch S, Lindemann U, Müller A, Rohleder N, Ellmers TJ, Burkard A, Freiberger E, Kob R. Sci Rep. 2025 Dec 12;15(1):43815.

Abstract

Concerns about falling (CaF) are common in older adults and are associated with increased falls. Although cautious gait-a gait pattern linked to CaF-has been described, the specific gait parameters most strongly associated with CaF remain unclear. This study investigates the association between gait characteristics at normal and maximal gait speed and CaF in community-dwelling older adults. This cross-sectional analysis merged data from two studies including participants aged 65 years and older: the FEARFALL-study, an intervention study to reduce CaF and improving walking stability, and from the MOGA-study, investigating the harmonization of supervised short-walk test protocols. Gait analysis was performed using an instrumented walkway and CaF was assessed by the Falls Efficacy Scale International (FES-I). Multiple stepwise regression models were used to explore the association of gait parameters with CaF and the associations of individual FES-I items with gait speed. Data from 261 participants (MOGA-study n = 150; FEARFALL-study n = 111; mean age 80.0 (± 4.6) years; 67% women) were analysed. Increasing FES-I levels were associated with decreasing walking performance across most gait parameters. Normal walking speed explained 24.9% of the variance in FES-I increasing to 29.2% by adding maximum gait speed and walk ratio. Four FES-I items dedicated to dynamic balance could be used to screen for cautious gait (adjusted R^2 = .201). Gait variables, especially gait speed, are strongly associated with CaF. FES-I items related to dynamic balance might be used to screen for cautious gait in community-dwelling older adults.

Keywords: Concerns about falling; Falls; Gait; Gait characteristics; Older adults.

Exploring balance challenge in fall prevention community exercise programs for older adults across Canada: A cross-sectional electronic survey of instructor perceptions

Abstract

Background: Exercise that challenges balance helps reduce falls in older people. Evaluating the intensity of balance challenge is difficult and no validated measures exist for group settings.

Objective: To examine how instructors determine and perceive balance challenge at the program level, and explore relationships between estimates of program-level balance challenge.

Design: Cross-sectional self-report study.

Setting: Electronic survey questionnaire approach.

Participants: Instructors of Canadian group exercise programs targeting community-dwelling older adults.

Measurements: Instructors perceived program-level balance challenge and estimates of program-level balance challenge.

Results: Most instructors (n = 108, 77%) perceived that their programs fully challenged balance among participants. However, no programs were identified as highly challenging. Most of the observed non-verbal balance challenge behaviours observed (n = 4, 80%) had no relationship to perception of balance challenge.

Conclusions: Findings suggest a misalignment between instructor perception and estimates of balance challenge at the program level. Further investigations of methods to assess balance challenge are warranted.

Keywords: Balance intensity; Community exercise; FITT principles; Fall prevention; Older adults.

The cost-effectiveness of the Dutch In Balance fall prevention intervention compared to exercise recommendations among community-dwelling older adults with an increased risk of falls: A randomized controlled trial

Delfgaauw J, Gameren MV, Voorn PB, Bossen D, Olij BF, Visser B, Pijnappels M, Bosmans JE. PLoS One. 2025 Dec 30;20(12):e0339497.

Abstract

Background: Falls among older adults are a growing public health issue, and are associated with injuries and increased societal costs. Therefore, implementation of effective fall prevention interventions is important. Given limited healthcare resources, evaluating the cost-effectiveness of these interventions is essential. Therefore, we aimed to evaluate the cost-effectiveness of the In Balance fall prevention intervention for community-dwelling older adults with an increased risk of falls compared to general physical activity recommendations (control) from a societal perspective.

Methods: An economic evaluation was conducted alongside a twelve month, single-blind, multicenter randomized controlled trial. Participants were 264 non- and pre-frail community-dwelling adults aged 65 years or older with an increased fall risk. We assessed costs from a societal perspective and effects included the number of falls, fall-related injuries, and Quality-Adjusted Life Years (QALYs) based on the EuroQol Five-level questionnaire (EQ-5D-5L) and the Adult Social Care Outcomes Toolkit (ASCOT). Missing data were handled using Multiple Imputation by Chained Equations (MICE). Incremental costs and effects were estimated using Seemingly Unrelated Regressions and used to estimate Incremental cost-effectiveness ratios (ICERs).

Results: On average, In Balance was less expensive and more effective than control, but differences were not statistically significant. ICERs indicated dominance of the intervention for prevented falls (€-14,329 per prevented fall), prevented fall-related injuries (€-14,569 per prevented injury), and QALYs based on both the EQ-5D-5L (€-168,265 per QALY gained) and ASCOT (€-135,797 per QALY gained). The probability of cost-effectiveness of In Balance compared to control was 98% at a willingness to pay (WTP) of €0 per unit of effect gained.

Conclusions: Based on this study, we conclude that In Balance may be considered cost-effective compared to control. Future research should explore whether In Balance as part of a comprehensive fall prevention strategy is cost-effective.

Trial registration: Research with human participants: NL9248 (registered February 13 2021, URL: https://www.onderzoekmetmensen.nl/nl/trial/26195).

The association between STOPPFall medication use and orthostatic hypotension in community-dwelling older people

Abstract

Introduction: Fall-risk-increasing drugs (FRIDs), identified by the Screening Tool of Older Persons Prescriptions in older adults with high fall risk (STOPPFall), may increase fall risk by causing orthostatic hypotension (OH).This study investigates the association between STOPPFall medication use and OH in community-dwelling older people ≥65 years using data from The Irish Longitudinal Study on Ageing (TILDA).

Methods: Orthostatic blood pressure (BP) was measured by active stand using a Finometer. STOPPFall medications were recorded at TILDA Waves 1 & 3.Delayed BP recovery was defined by a reduction in systolic BP (sBP) ≥20 mmHg and/or diastolic BP ≥ 10 mmHg from baseline at 30 seconds after standing, 'any OH' a similar BP reduction at either 30, 60, 90 or 120 seconds post-stand, and classical OH by persistent reduction in sBP at all timepoints (30-120 seconds) post-stand.Regression models assessed the association between STOPPFall medications and OH and orthostatic sBP changes.

Results: One STOPPFall medication was prescribed in 26.9% (403/1499) of participants; 10.6% (159/1499) were prescribed ≥2 STOPPFall medications. Prescription of ≥2 STOPPFall medications was independently associated with delayed BP recovery [odds ratio (OR) 1.88 (95% CI 1.25-2.82); P = .003], 'any OH' [OR 1.48 (95% CI 1.00-2.18); P = .048], and classical OH [OR 2.07 (95% CI 1.13-3.78); P = .018], and was associated with significantly lower sBP at 30- [coefficient -7.91(95% CI -10.22 to -5.60); P < .001], 60- [coefficient -5.55(95% CI -7.86 to -3.24); P < .001], 90- [coefficient -2.63(95% CI -4.95 to -0.32); P = .026], and 120 seconds [coefficient - 3.67(95% CI -5.98 to -1.36); P = .002]. Increasing STOPPFall medication at Wave 3 was associated with significantly lower sBP at 30 seconds [coefficient -3.22(95% CI -5.73 to -0.72); P = .012].

Conclusion: Prescription of ≥2 STOPPFall medications was associated with significantly delayed BP recovery post-stand and OH. This highlights that rationalising STOPPFall medications is indicated in older people with OH.

Keywords: blood pressure; deprescribing; fall-risk-increasing drugs; older people; orthostatic hypotension.

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Effects of Long-Term Minimal Footwear Use on Fall-Risk and Fall Incidence in Older Adults

Abstract

Introduction: Foot-related factors such as plantar foot muscle weakness, hallux valgus, hammer toe, excessive pronation, and foot pain are known causes of falls in older adults (ages > 65). Minimally cushioned footwear may naturally strengthen and provide enhanced sensory awareness to the feet, leading to reduced fall risk. The purpose of this study was to analyze the effects of long-term minimal footwear use on fall risk and fall incidence in older adults with established fall risk.

Methods: Adult volunteers ages > 65 were screened for fall risk and randomized into minimal footwear (n=33) and control (sham intervention, n=32) groups. Participants performed intervention or control activities 5x/week for 16 weeks and then at least 2x/week for the remainder of the 1-year study. They were measured for fall risk using the Mini Balance Evaluation Systems Test (Mini-BESTest) at baseline, 16 weeks, and 1 year. Participants kept written journals of intervention adherence and falls, and were contacted bimonthly to collect details on falls. A mixed-effects linear model analysis was used to measure change in fall risk. The minimimal detectable change (MDC) of > 3.5 points defined "meaningful change". Fall incidence was analyzed with number of falls per participant, proportion of fallers in each group, and fall rates per person-year. Time-to-first-fall analyses using Kaplan-Meier survival curves were used to visualize the cumulative probability of remaining fall-free over the 1-year period. The log-rank test was used to evaluate differences between groups.

Results: Minimal footwear group made significant improvements in Mini-BESTest scores at both follow-up time points (16 weeks: 2.24 points, p < 0.001; 1 year: 2.62 points, p < 0.001) compared to no improvements made by control group (16 weeks: 0.108 points, p=0.794; 1 year: 0.119 points, p=0.797). At 16 weeks, 28.6% of minimal footwear group and 3.3% of control group achieved the MDC (p =0.005). At 1 year, 23.1% of minimal footwear group and 7.4% of control group achieved the MDC (p=0.111). Fall incidence was not significantly different between groups at 1 year; however, minimal footwear group had fewer falls, a smaller proportion of fallers, and longer time to first fall. For the 1-year study duration, 76.9% of minimal footwear group and 51.9% of control group remained fall-free.

Conclusion: Long-term minimal footwear use resulted in meaningful improvements in balance and reduced fall risk in older adults. This type of footwear can be gradually incorporated into daily activities using our progressive schedule, or could be included in existing fall-prevention programs. This study was underpowered to detect fall incidence, and we did not see a difference in falls incidence between groups.

Effect of proprioceptive neuromuscular facilitation on balance, strength, cognition and ADL'S IN elderly - A randomized control study

Abstract

Background: A common and significant worry for people in their later year falls. Falls are frequently caused by residual impairments, including decreasing strength, poor sensory processing, balance issues, and cognitive gait inadequacies. Deficits in movement and balance can persist for years and are associated with a high fall rate (>6 months). Neuromuscular re-education by proprioceptive neuromuscular facilitation involves stimulating sensory receptors to provide feedback on incorrect movement and posture.

Objective: To Identify the effects of PNF on Balance, Strength, cognition and ADL.

Methods: 32 participants in all were divided into Group A and Group B at random. Participants had to be 65 years of age or older, have a history of falls within the previous year, be able to walk independently, be willing to participate, and not have cardiovascular or respiratory disorders, chronic neurological conditions, hearing or speech impairment, acute orthopaedic conditions, or head injuries.

Results: The results for both groups showed significant improvements from baseline to post-test analysis. When compared to one another, Group A shown more progress than Group B in BBS and Lower Limb Strength. No Statistically Significant changes were observed in the MMSE, KLE's Functional Scale, and Hand-Held Dynamometer for Upper Limb pre and post values, respectively ($p < 0.05$).

Conclusions: According to the study, Exercises have shown to improve both the groups. PNF-based exercises improved Lower Limb strength and balance.

Keywords: Activities of daily living; Balance; Cognition; Geriatric rehabilitation; Older adults; Proprioceptive neuromuscular facilitation.

Integrating Cognitive and Motor Dual-task Training to Prevent Fall Risk Among Community-dwelling Elderly in Thailand: A Randomized Controlled Study

Jattanond W, Sutalangka C, Namkorn P, Sitthipornvorakul E, Atsawakaewmongkhon S, Suwannakul B, Ganogpichayagrai A, Kongkratoke S, Taniguchi R, Chaiut W. J Prev Med Public Health. 2025 Nov;58(6):609-619.

Abstract

Objectives: Falls are a leading cause of morbidity and mortality among older adults, often resulting in severe injuries and a loss of independence. Dual-task training, which integrates cognitive and motor exercises, has emerged as a promising intervention for fall prevention. This study aimed to evaluate the effects of a structured cognitive and motor dual-task training program on fall risk, balance, and cognitive function in community-dwelling older adults.

Methods: Seventy-two participants aged 60 years or older were randomly assigned to either an intervention group (IG, n=36) or a control group (CG, n=36). The IG underwent 3 sessions per week for 8 weeks (totaling 24 sessions) that incorporated simultaneous cognitive and motor exercises, while the CG continued their usual total body stretching exercise. Assessments were conducted at baseline, week 4, and week 8, and included gait speed (10-meter walk test), functional performance (Timed Up and Go test), cognitive function (Montreal Cognitive Assessment), and quality of life (World Health Organization Quality of Life Assessment).

Results: Participants in the IG demonstrated significant improvements in functional performance ($p<0.05$) and enhanced cognitive function compared to the CG after both 4 weeks and 8 weeks of training. Functional performance and cognitive function significantly improved after 8 weeks of training ($p<0.01$). However, the intervention did not produce changes in gait speed or quality of life.

Conclusions: Integrating cognitive and motor dual-task training into fall prevention programs may enhance functional stability and cognitive resilience in older adults. Future studies should investigate long-term adherence and determine the optimal training intensity.

Keywords: Accident prevention; Cognition; Elderly; Physical functional performance; Training.

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Treadmill perturbation-based balance training to prevent unrecovered falls in fall-prone older adults with and without cognitive impairment: protocol for the multi-center randomized controlled TRAIL study

Koschate-Storm J, Werner C, Bartel J, Bauer JM, Becker C, Drefs S, El-Seoud N, Giehl C, Hackbarth M, Hezel N, Klenk J, Trampisch U, Wirth R, Zieschang T, Schwenk M. BMC Geriatr. 2025 Dec 23.

Abstract

Background: Approximately one-third of older adults fall each year, most often due to slips or trips. Fall incidence is even higher in those with cognitive impairment (CI). Among older adults who fall, about 50% are unable to get up without assistance. Such unrecovered falls are particularly critical, as they are linked to prolonged lying periods, an increased risk of medical complications, and mortality. As unrecovered falls require third-party assistance, they offer an opportunity to incorporate proxy information into fall reporting to reduce recall bias. Perturbation-based balance training (PBT) aims to improve recovery reactions in response to balance disturbances such as slips and trips and thereby prevent falls. This task-specific approach has shown promise in reducing falls in low-risk older adults. However, its efficacy in high-risk populations, especially in participants with CI, remains largely unknown. The primary aim of the TRAIL study is to evaluate the efficacy of treadmill PBT in reducing unrecovered falls among fall-prone older adults with and without CI.

Methods: In this multi-center, assessor-blinded, randomized controlled parallel-group trial, 396 older adults (≥ 70 years) at risk of falling (≥ 40% prospective fall risk, Timed Up and Go ≥ 10 s) will be assigned (1:1) to receive nine sessions of either treadmill PBT or conventional treadmill training (CTT) over three weeks. The primary outcome is the incidence of unrecovered falls within twelve months post-intervention, tracked via monthly fall calendars, phone interviews, proactive reporting, and proxy information. Secondary outcomes include other fall-related outcomes (e.g. total falls, injurious falls, falls per physical activity), physical capacity and activity, psychological status, and cognitive functioning. Assessments will be conducted at baseline, post-intervention, as well as six and twelve months after the intervention. Primary analyses will follow the intention-to-treat principle.

Discussion: Treadmill PBT is expected to reduce unrecovered falls by ≥ 50% over twelve months, compared to CTT. If effective, the low-volume PBT approach can serve as an important treatment option for the rapidly growing group of fall-prone older adults, especially those with CI, for whom evidence-based strategies for fall prevention remain limited.

Trial registration: Prospectively registered at ClinicalTrials.gov (NCT06652828). First posted: 2024-10-22, last update posted: 2025-05-14.

Keywords: Cognition; Fall prevention; Outpatient care; Physical activity; Reactive balance.

Assessing the cutoffs of four commonly used fall risk assessment tools for old Chinese community-dwellers: A prospective study

Li W, Fu Y, Wu Y, Schwebel DC, Lei G, Liu H, Zhao M, Zhang T, Li L, Ning P, Rao Z, Hu G. J Safety Res. 2025 Dec;95:125-132.

Abstract

Introduction: To compare predictive performances of existing cutoffs developed outside China for four commonly-used fall risk assessment tools and new cutoffs based on a Chinese sample.

Method: A 12-month prospective study was conducted between April 2023 and June 2024 in Changsha, China. The Stay Independent Brochure Questionnaire (SIB), Fall Efficacy Scale International (FES-I), Home Falls and Accidents Screening Tool (HOME FAST), and Time Up and Go Test (TUGT) were included. New cutoffs were developed by plotting receiver operating characteristic (ROC) curves and calculating the largest Youden index. Chi-square test was used to compare predictive performances of new and old cutoffs for the same assessment tools.

Results: The study was completed by 1,237 older adults. The new cutoffs for SIB, FES-I, HOME FAST, and TUGT in predicting falls were 3 points, 18 points, 5 points, and 10.6s, respectively, with AUC values ranging from 0.513 (95% CI: 0.485-0.542) for HOME FAST to 0.631 (95% CI: 0.604-0.658) for SIB. For predicting fall-related injuries, the new cutoffs were 3 points for SIB, 26 points for FES-I, 5 points for HOME FAST, and 11.7s for TUGT, with AUC values ranging from 0.530 (95% CI: 0.502-0.558) for HOME FAST to 0.628 (95% CI: 0.601-0.655) for SIB. Compared with the existing cutoffs, the new cutoff values for all tools generally showed significantly improved sensitivities but reduced specificities.

Conclusions: The newly-determined cutoffs showed somewhat improved predictive performance over the existing cutoffs in sensitivity, but neither set of cutoffs achieved good predictive performance among older Chinese community-dwellers when the fall risk assessment results were used solely, without supplemental information.

Practical applications: Considering the poor predictive performances of the four commonly-used fall risk assessment tools with either set of cutoffs, we recommend use of the tools along with supplemental information to predict future fall risk among older adults in China.

Keywords: China; Cutoff value; Fall-related injuries; Falls; Old adults; Risk assessment tool.

Performance of risk assessment algorithms recommended by the World Falls Guidelines (WFG) to predict fall and fall-related injury among older Chinese community-dwellers

Li W, Zhao M, Fu Y, Schwebel DC, Zhang N, Yang L, Zhou J, Wu Y, Zhang T, Ning P, Li L, Rao Z, Hu G. J Safety Res. 2025 Dec;95:338-344.

Abstract

Introduction: The World Falls Guidelines (WFG) Task Force published a falls risk stratification algorithm in 2022, but its predictive performance was reported only in Ireland, the United States, the Netherlands, Australia, and Malaysia.

Methods: Using a nationally representative dataset, the China Health and Retirement Longitudinal Study (CHARLS), we analyzed data from six follow-up cohort visits (2, 3, 4, 5, 7, 9 years). The Cochran-Armitage trend test examined trends in fall and fall-related injury rate across the WFG algorithm. Multivariable logistic regression models examined associations between the WFG algorithm and fall and fall-related injury incidence rates. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and 95% confidence intervals (95% CIs) were calculated to assess predictive performance of the WFG algorithm. Sensitivity analyses were performed to assess the impact of missing values on principal findings.

Results: We included 9,735, 5,377, 4,092, 9,426, 7,776, and 3,355 eligible older adults across the six follow-up time periods, with sample sizes varying due to the study's dynamic recruitment strategy. Fall risk categorized by WFG algorithm was significantly associated with falls and fall-related injuries at all six follow-up cohorts ($p < 0.05$). However, its predictive performance for both falls and fall-related injuries was unacceptable, with sensitivity ranging from 20.2% to 32.5% for both outcomes across the six follow-up visits. Sensitivity analyses displayed highly similar results.

Conclusion: The WFG algorithm is valuable for predicting future falls and fall-related injuries among older Chinese community-dwellers, but its predictive performance is unacceptable for practical use without considering other contributing factors.

Practical applications: Further methodological modifications of the WFG algorithm are recommended to improve its predictive performance.

Keywords: China; Fall-related injuries; Falls; Older adults; Predictive performance; World fall guidelines algorithm.

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E-ACTIVE AGING study protocol: Evaluating an exergame-based and multicomponent exercise program for community-dwelling older adults at risk of falling

Lillo-Urzúa P, Ugarte-Llanten J, Carreño-Zilmann G, Vidal-Seguel N, Guede-Rojas F, Cuenca-García M, Cigarroa I. Front Physiol. 2025 Dec 3;16:1691454.

Abstract

Background: Falls among older adults represent a major cause of morbidity and mortality, leading to decreased physical activity, loss of independence, and increased dependency. Individuals aged 60 years and older, particularly those with sensory deficits, are at greater risk. While conventional fall-prevention programs are widely implemented, innovative strategies such as active exergames have emerged as promising approaches to enhance balance and reduce fall risk.

Objective: This study aims to evaluate the effectiveness of a supervised exergame-based multicomponent intervention compared to a traditional multicomponent training program in community-dwelling older adults at risk of falling.

Methods: A randomized controlled trial with parallel groups and blinded assessment will be conducted among older adults (≥60 years) recruited from senior centers (SENAMA, Chile). Fifty-two participants will be randomly allocated to either an exergame group (n = 26), performing interactive full-body movements using the Nintendo Switch®, or a traditional multicomponent training group (n = 26). Both groups will receive 1-h supervised sessions twice weekly for 12 weeks. The primary outcomes will include fall risk, balance performance, functional independence and cardiorespiratory fitness. Secondary outcomes will assess body composition, muscular strength and quality, physical activity level, quality of life, and pain intensity and interference.

Expected results: It is hypothesized that both interventions will improve functional and balance outcomes, with the exergame-based program potentially promoting greater adherence and superior overall effects.

Clinical trial registration: ClinicalTrials.gov. Identifier: NCT07024004**.**

Keywords: exergame; functional capacity; multicomponent exercise; older adults; risk of falls; static and dynamic balance; strength.

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Association and predictive value analysis for mobility assessments and concerns about falling on falls in community-dwelling older adults: a prospective cohort study in China

Abstract

Background: A series of mobility and concerns about falling measurement instruments are recommended by guidelines for fall prevention in older adults for fall risk assessment. However, evidence regarding their value in evaluating and predicting fall risk is inconsistent. This study aims to examine the associations and predictive ability between these assessments and falls in community-dwelling older adults in China.

Methods: Mobility of 2544 participants aged [Formula: see text]60 years was assessed at baseline using the Timed Up and Go (TUG), Eyes-Closed Unipedal Stance Test (ECUST), 30-second Chair Stand (30s-CS), and concerns about falling were assessed by the Falls Efficacy Scale International (FES-I). Fall events were followed for nearly 12 months. Associations of mobility assessments and concerns about falling with falls were examined using Cox proportional hazard and restricted cubic spline regression. The C-statistic, net reclassification improvement (NRI) and integrated discrimination improvement (IDI) were employed to evaluate the predictive value of mobility assessments, concerns about falling, and additional risk factors.

Results: During the follow-up period, 236 (9.28%) participants reported at least one fall. Each standard deviation increase in TUG time was associated with a 1.154-fold greater risk of falls (95% CI: 1.035-1.286). Compared with participants with FES-I score ≤ 45, those with FES-I score > 45 had a 1.346-fold greater fall risk, with marginal statistical significance(95% CI: 0.995-1.822, P = 0.054). The ECUST and the 30s-CS were not associated with fall risk in the overall sample. Nonlinear relationship was not observed between mobility assessments and fall risk. And the non-linear correlation was marginally significant between FES-I and fall risk (P = 0.056). The predictive accuracy of the TUG and FES-I used in isolation or in combination was poor, with C statistics ranging from 0.545 to 0.568. The predictive performance was significantly enhanced but still insufficient after baseline characteristics were incorporated into the model, with a C-statistic of 0.631 (95% CI: 0.594-0.667), an IDI of 0.013 (95% CI: 0.010-0.040) and a NRI of 0.178 (95% CI: 0.111-0.260).

Conclusion: The TUG test is an useful tool for evaluating fall risk in community-dwelling older adults. The FES-I has potential to identify older adults at an elevated risk of fall with a cut-off value of 45. However, their ability to predict falls is limited. Incorporating additional fall-related factors improves the predictive performance but is still inadequate.

Keywords: Accidental falls; Concern about falling; Mobility assessment; Older adults; Predictive ability.

Perturbation-Based Balance Training on Fall Incidence, Mobility, Postural Control, and Fear of Falling of the Older Adults: A Systematic Review and Meta-Analysis

Mohammadi S, Lotfi M, Zarei H. J Appl Gerontol. 2025 Dec 29:7334648251412655.

Abstract

Perturbation-based training (PBT) is a balance training method that uses externally applied mechanical perturbations to trigger rapid reactions for regaining postural stability in a controlled environment. However, there is a lack of comprehensive reviews on PBT's efficacy in older adults. Therefore, this study investigated the impact of PBT on older adults. Primary sources were gathered from SCOPUS, PubMed, CENTRAL, and Web of Science, covering data up to January 23, 2025. The analysis included 17 studies with 1,006 participants. Results indicated that PBT significantly reduced fall incidence (SMD: 4.82, 95% CI: 3.10-6.55, p = 0.001) and improved balance control (SMD: 0.47, p = 0.001), Timed Up and Go (SMD: 0.64, p = 0.02), fear of falling (SMD: 0.62, p = 0.004), reactive balance control (SMD: 0.72, p = 0.002), gait speed (SMD: 0.50, p = 0.01), and postural stability (SMD: 0.38, p = 0.001). The findings revealed that PBT improved mobility, postural control, and fear of falling while decreasing the fall incidence of older adults.

Factors Influencing Success and Long-Term Engagement With Aunty Roma's Falls Prevention Program

Newton L, Filewood K, Pham M, Gupta A, Reath J, Thomson D. Health Promot J Austr. 2026 Jan;37(1):e70137.

Abstract

Issue addressed: The use of Aboriginal and Torres Strait Islander health programs is linked to improved health outcomes for Aboriginal and Torres Strait Islander communities. This study sought to understand the strengths within Aunty Roma's falls prevention program that have facilitated successful implementation, continued engagement and improved health outcomes. This study is the first to explore perspectives surrounding an Aboriginal and Torres Strait Islander falls prevention program that has demonstrated long-term success in a hospital environment.

Methods: Indigenous methodologies were used to inform a qualitative descriptive research design and gather Aboriginal and Torres Strait Islander perspectives through a yarning circle and individual yarns. An Aboriginal Reference Group was established to provide community control over the research process and ensure prioritisation of local Aboriginal and Torres Strait Islander knowledge and cultural values. Thematic analysis was used to produce key themes.

Results: Yarning was conducted with two healthcare workers and nine group members involved in Aunty Roma's. Themes emerging from the data included community ownership, staff commitment, cultural safety, flexibility, social connection and relationships and improved health access and outcomes.

Conclusions: This research demonstrates that through strong partnerships with staff and the community, and commitment to long-term implementation, hospital-based Aboriginal and Torres Strait Islander falls prevention programs can be culturally safe and successful in the long term. These findings will benefit the community involved through documentation of factors contributing to success, driving continual improvement of the program. The findings may also inform implementation of similar programs in the future.

Keywords: Australian aboriginal and Torres Strait islander peoples; accidental falls; community participation; culturally competent care; hospitals.

Falls Research
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Multimodal analysis of postural control in adults at risk of falls

Paramento M, Passarotto E, Agostini M, Formaggio E, Contessa P, Ceolin C, Sergi G, Masiero S, Rubega M. Annu Int Conf IEEE Eng Med Biol Soc. 2025 Jul;2025:1-4.

Abstract

Proprioception declines with age, increasing the risk of falls in older adults. Conditions such as osteoporosis, which are highly prevalent in this population, further increase both the risk of falls and the severity of resulting injuries. The aim of this study was to evaluate a 3-week NeuroMuscolar Taping treatment to improve postural control in 10 older adults (> 65 y.o.) with mild osteoporosis. Electroencephalography (EEG) and center of pressure (CoP) signals were recorded during a sensory orientation task of the Mini Balance Evaluation Systems Test before (T0) and after (T1) treatment. Nonlinear analysis using the Higuchi Fractal Dimension (HFD) algorithm was performed on both EEG and CoP signals. Changes in HFD EEG and CoP values between T0 and T1 were analysed using linear mixed-effects regression models and their correlation using a latent change score model. At T1, participants showed decreased HFD EEG values in the central brain region ($p < 0.001$) and increased HFD CoP values ($p < 0.05$). A negative correlation was observed between changes in HFD EEG and HFD CoP values between T0 and T1 ($p < 0.05$). The results suggest that older adults may have improved flexibility and adaptability in postural control, as well as better cognitive load management. Clinical relevance- Falls are a major cause of functional impairment in older adults. In Italy, nearly one in ten older adults are prone to falls, which result in hospitalisation in a fifth of cases. This study provides evidence for a feasible intervention that could improve postural control and reduce the risk of falls.

What to Know About Falls in Older Adults? Risk Factors, Predictors, and Therapeutic Interventions

Abstract

Background: Approximately one quarter of community-dwelling older adults experience at least one fall each year. Falls can result in soft tissue injuries, fractures, or even death. Given this high prevalence, it is essential to identify fall-related risk factors, develop predictive models, and prescribe effective exercise-based interventions to prevent falls.

Objective: To analyze risk factors, predictors, and therapeutic interventions for falls in older adults.

Methods: A literature search was conducted in SCIELO, PUBMED, and PEDro databases between 15-20 October 2025. Inclusion criteria comprised peer-reviewed, open-access studies in English published from 2020 onward. Findings were categorized into three domains: (1) fall risk factors, (2) predictive models, and (3) exercise-based interventions. Twenty studies met the inclusion criteria.

Results: Falls among older adults arise from multifactorial interactions involving physical, clinical, cognitive, and social factors such as impaired mobility, comorbidities, polypharmacy, and cognitive decline. Lower-limb strength and functional performance are key determinants of fall risk. Current predictive models show limited accuracy, with fall history as the strongest predictor. Exercise-based interventions, particularly multicomponent and home-based programs, improve balance, strength, and mobility but show variable effects on fall rates. The absence of standardized parameters for exercise prescription limits the development of evidence-based guidelines.

Conclusions: Falls in older adults are multifactorial events influenced by physical and cognitive decline. Predictive models remain imprecise, and although exercise interventions improve functional outcomes, their impact on reducing falls is inconsistent. Standardized exercise protocols are needed to optimize fall prevention strategies.

Keywords: gerontology; physical therapy; prevention.

Every Fall Matters: Challenging Ageism and Negative Self-Perception of Aging

Abstract

Falls are a preventable health event that often signals deeper physical, psychological, and socioenvironmental vulnerabilities. Yet, ageism and negative self-perception of aging, rooted in psychological mechanisms, such as stereotype embodiment, continue to obscure this reality. The pervasive belief that "older people just fall" is not only inaccurate but also harmful, leading to under-recognition, under-treatment, and under-engagement in fall prevention efforts. These ageist assumptions delay critical interventions, discourage older individuals from seeking help, and perpetuate a cycle of decline. Psychiatric-mental health nursing plays a vital role in addressing these psychological barriers, promoting awareness, and fostering resilience. By adopting a holistic, respectful, and empowering approach, fall prevention can be framed as a pathway to independence and vitality. This shift transforms fall prevention from a reactive safety measure into a proactive strategy, rooted in equity, dignity, and thriving in later life. Older adults deserve autonomy and the opportunity to thrive.

Care Partner Engagement in Fall Risk Management Programs for Community-Dwelling Older People with Cognitive Impairment: A Systematic Review

Abstract

Background/purpose: Older people with cognitive impairment (CI) are at significantly higher fall risk compared to those without CI. Their care partners' engagement is critical to facilitate their participation and adherence in fall risk management (FRM) programs. This systematic review aims to synthesize terms and measures of care partner engagement (CPE) in FRM programs for community-dwelling older people with CI, facilitators and barriers to CPE, and promising CPE enhancement strategies.

Methods: We conducted a systematic search of eight databases and included relevant literature published between 1985 and 2024 through a manual search. Guided by a conceptual framework of CPE informed by existing literature, we conducted content analysis and thematic synthesis to address our research aims. We assessed the quality of included studies using the Mixed Methods Appraisal Tool.

Results: Thirty-two studies were included in the synthesis. There was substantial heterogeneity of CPE terms and measures. CPE facilitators and barriers were summarized under three categories: older people with CI (eg, interest, health, and functional statuses), care partners (eg, motivation, perceived burden, caring relationships), and service providers or programs (eg, supportive instructors, service disruptions). CPE enhancement strategies (eg, tailored intervention content, provision of professional and social support) were summarized, with some (eg, using a discussion tool, providing flexible schedules) showing promising effects on CPE.

Conclusion: Our review synthesized the common practice of CPE in FRM programs for community-dwelling older people with CI and introduced a novel conceptual framework to clarify the multidimensional nature of CPE. Our findings emphasized the urgent need to develop consistent language and validated measures for describing and assessing CPE. This review has also identified important considerations, including facilitators, barriers, and promising strategies to enhance CPE in these programs, informing the development of effective care-partner-engaged FRM programs for older people with CI.

Keywords: behavioral engagement participation; cognitive impairment; falls; informal caregiving; intervention.