

Featured Falls Research – September

Reducing concerns about falling in older adults: evaluation of a multi-component intervention and the role of stress and inflammation markers - long-term effects of the FEARFALL randomized controlled trial

Britting S, Müller A, Kob R, Freiberger E, Rohleder N. Aging Clin Exp Res. 2026 Sep 19;38(1):195.

DOI: [10.1007/s40520-026-03515-z](https://doi.org/10.1007/s40520-026-03515-z)

PMID: 42703107

Abstract

Background: Concerns about falling (CaF) are common in older adults and associated with reduced activity and poorer health. This study investigated, for the first time, the long-term effects of a multi-component intervention targeting CaF on psychological, functional, biophysiological, and anthropometric outcomes.

Methods: 160 community-dwelling older adults (≥ 70 years) were randomly assigned to a 4-month intervention featuring exercise and cognitive-behavioral training or to a sham control group. CaF and related psychological outcomes were assessed using validated questionnaires. Salivary cortisol and α -amylase, physical function, activity, body composition and inflammatory markers (C-reactive protein [CRP]-, interleukin-6 [IL-6], interleukin-10 [IL-10], interleukin-1 β [IL-1 β] and tumor necrosis factor- α [TNF- α]) were analyzed at baseline, post-intervention, and 8-month follow-up.

Results: All estimates represent T0-T2 estimated marginal mean differences. There was no intervention effect or long-term superiority between the groups. Significant time effects were observed for CaF and physiological biomarkers for stress axis activity and inflammatory markers. Functional outcomes changed only marginally.

Conclusion: CaF improved similarly in both groups. Changes in basal stress system activity and inflammatory cytokines were highly comparable between groups. Contrary to our hypothesis, the intervention did not confer additional benefits over the sham control intervention in reducing CaF.

Trial registration: German Clinical Trials Register (DRKS): DRKS00029171. Registered 22 July 2022, <https://drks.de/search/de/trial/DRKS00029171>.

Keywords: Community-dwelling; Concerns about falling; Cortisol; Inflammation; Older adults; Stress.

Effectiveness and cost-effectiveness of the Keep-On-Keep-Up digital falls prevention programme in community-dwelling older adults: results of a randomised controlled trial

French C, Parchment A, Odebiyi B, Shi C, Bashir S, Dowding D, Kislov R, Thompson A, Skelton DA, Clarke M, Sylvestre Garcia Y, Ahmed SS, Todd CJ, Bower P, Stanmore E. Age Ageing. 2026 Sep 4;55(9):afag291.

DOI: [10.1093/ageing/afag291](https://doi.org/10.1093/ageing/afag291)

PMID: 42784541

Abstract

Background: Falls are a leading cause of injury-related hospital admissions among older adults with substantial burden on health and social care systems. Digital exercise programmes may improve physical function at scale and complement traditional services. Keep-On-Keep-Up (KOKU) is an National Health Service (NHS)-approved digital programme offering progressive, evidence-based exercises and education on fall prevention. We aimed to evaluate the effectiveness and cost-effectiveness of KOKU for improving balance, physical function and reducing fall risk among community-dwelling older adults.

Methods: A two-arm, parallel group randomised controlled trial was conducted with community-dwelling older adults (≥ 60 years). Participants were randomised (1:1) to receive KOKU alongside standard care (strength and balance exercise advice and a falls prevention leaflet) or standard care alone. The primary outcome was balance function at 12 weeks (Berg Balance Score). Secondary outcomes included lower limb strength, concerns about falling, falls, mood, pain, fatigue, healthcare utilisation, health-related quality of life and usability. A modified intention-to-treat approach was used to analyse effectiveness and cost effectiveness.

Results: A total of 202 older adults (mean age 76.8 years, 72.8% female) were enrolled (102 intervention; 100 control). Retention at 12-weeks was 89.1% (91 intervention; 89 control). Compared with standard care, KOKU significantly improved balance function at 12 weeks after adjusting for baseline scores (mean difference: 6.35, 95% confidence interval [CI]: 4.48, 8.22). KOKU was associated with lower mean falls related costs (incremental cost: -£62.98, 95% CI -£218.54 to £40.22) and a quality-adjusted life year gain of 0.020 (95% CI 0.003 to 0.035).

Conclusion: The KOKU programme improves balance with preliminary evidence of cost-effectiveness among community-dwelling older adults. These findings support the integration of digital innovation into routine care to improve balance and strength, thereby reducing functional decline while delivering value for money.

Keywords: aged; digital health; falls prevention; older people; postural balance; randomised controlled trial.

Standing strong and tall-improving mobility and balance in older Aboriginal people through the Ironbark program

Ivers R, Clapham K, Ryder C, Macniven R, Hill AM, Moeller H, Haynes B, Gidgup M, McCarthy L, Mackean T, Delbaere K, Tiedemann A, Sherrington C, Coombes J, Ironbark Investigators Group. Age Ageing. 2026 Sep 4;55(9):afag264.

DOI: [10.1093/ageing/afag264](https://doi.org/10.1093/ageing/afag264)

PMID: 42704260

Abstract

Background: Prevention of falls aids healthy ageing, but there are few Aboriginal-led and designed programs.

Objectives: This study aimed to evaluate the effect of Ironbark, an Aboriginal co-designed fall prevention program, on functional mobility, a key indicator of falls.

Methods: This controlled pre-post study was conducted in organisations delivering services to Aboriginal people aged 45 years and older in New South Wales and Western Australia. A co-designed fall prevention program incorporating exercises and yarning circles targeting fall risk factors ('Ironbark Standing Strong and Tall') was compared to a social program ('Ironbark Healthy Community'). Data were collected at baseline and after 12 months of follow-up.

Results: The 'Ironbark Standing Strong and Tall' program was delivered at 16 sites and the 'Healthy Community' program at three. Due to lower recruitment than anticipated, combined analysis was not possible. There were significant improvements in the 'Ironbark Standing Strong and Tall' participants for the primary outcome of functional mobility (Short Performance Physical Battery; a change of 0.8 points, 95% CI: 0.4-1.1), reductions in stepping times, improvements in leg stance and increased incidental and planned exercise. There were no significant changes in falls, health-related quality of life (HRQoL) or psychological distress. Participants in the 'Healthy Community' sites had no change in functional mobility but saw declines in HRQoL, physical activity and stepping time.

Conclusions: A co-designed and delivered program for older Aboriginal people, implemented in community settings aligned with stated priorities of Aboriginal older people, improved functional mobility.

Keywords: co-design; community led; healthy ageing; indigenous health; older people.

Effects of the 'ReacStep' training program on balance recovery and fall risk factors in older people: an assessor-blinded randomised controlled trial

Sharma S, Chaplin C, Hicks C, Treacy D, Farlie MK, Phu S, Smith N, Gibson H, Ho C, Coleman E, Huang T, Canning CG, Allen NE, Close JC, Lord SR, Okubo Y. Age Ageing. 2026 Sep 4;55(9):afag259.

DOI: [10.1093/ageing/afag259](https://doi.org/10.1093/ageing/afag259)

PMID: 42696641

Abstract

Background: Reactive balance training (RBT) using repeated perturbations may reduce falls; however, training methods are not easily replicated or translatable to clinical settings. This study aimed to examine the effects of a novel RBT program on balance recovery from laboratory-induced trips and slips and fall risk factors in older people using simple and low-cost equipment.

Methods: We conducted a randomised controlled trial involving 88 older people. An intervention group (n = 43) received the ReacStep program, which involved tether-release reactive stepping and intentional slips once a week for 6 weeks. Both the intervention and control (n = 45) groups received home-based strength training for 8 weeks. Blinded staff assessed reactive balance (laboratory-induced falls), physical functions at baseline (week 1) and post intervention (week 8). Weekly short-message service (SMS) surveys ascertained falls in daily life over 12 months.

Results: Both groups were comparable in demographics, with a mean age of 72 years (SD = 5.6). Adherence to ReacStep sessions was high (90%). There were no significant differences between groups in laboratory-assessed reactive balance falls at post-test or daily-life falls over 1 year (P = .19). However, at post-test, the intervention group demonstrated significant improvements in maximum step length and choice stepping reaction time compared to controls (P <.05).

Conclusion: The ReacStep program demonstrated excellent adherence, was well tolerated and improved the ability to take larger and quicker steps in older people. As these improvements did not translate to unexpected trips and slips and daily life falls, the findings highlight the need for further optimization of the program for improving reactive balance and preventing falls.

Keywords: accidental falls; aged; exercise; older people; postural control; reactive balance training.

Multifactorial and multiple component interventions for preventing falls in older people living in the community

Swarnalatha C, Wood L, Newell P, Clark CE, Adedire O, Clemson L, Sherrington C, Lamb SE. Cochrane Database Syst Rev. 2026 Sep 21;9(9):CD012221.

DOI: [10.1002/14651858.CD012221.pub3](https://doi.org/10.1002/14651858.CD012221.pub3)

PMID: 42764178

Abstract

Rationale: Multifactorial fall prevention interventions are those where intervention components are tailored to each person's individual fall risk factor profile. Multiple component interventions provide the same components to everyone. The evidence on the effects of these interventions is inconclusive. This review updates one published on the Cochrane Library in 2018.

Objectives: To assess the effects of multifactorial and multiple component fall prevention interventions compared to usual care or attention control, exercise, and falls prevention advice or education in community-dwelling older people.

Search methods: We searched the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, Embase, CINAHL, ClinicalTrials.gov, the WHO ICTRP, and reference lists, without restrictions on language or full-text publication, on 16 May 2024.

Eligibility criteria: We included randomised controlled trials (RCTs) of community-dwelling older people (≥ 60 years) evaluating multifactorial or multiple component fall prevention interventions. We excluded quasi-randomised trials, stroke or Parkinson's disease populations, and comparisons with single active interventions other than exercise.

Outcomes: Our critical outcomes were falls rate (falls per person-year), risk of falling (number of people sustaining one or more falls), and risk of recurrent falls (number of people sustaining two or more falls).

Risk of bias: We assessed risk of bias in the included studies using Cochrane's RoB 1 tool.

Synthesis methods: We calculated rate ratios (RaR) and risk ratios (RR) with 95% confidence intervals (CIs). Where possible, outcomes were synthesised using random-effects meta-analysis and pooled with the generic inverse-variance method; otherwise, findings were narratively summarised. We assessed the certainty of evidence using the GRADE approach.

Included studies: This update includes 110 RCTs involving 48,919 older people.

Synthesis of results: Risk of bias was mixed, and there was potential publication bias in a few comparisons. Multifactorial interventions versus usual care or attention control Multifactorial interventions may reduce falls rate (RaR 0.76, 95% CI 0.67 to 0.87; $I^2 = 92\%$; 29 trials, 9442 participants; low-certainty evidence) and the risk of recurrent falls (RR 0.87, 95% CI 0.78 to 0.98; $I^2 = 45\%$; 17 trials, 4826 participants; low-certainty evidence). They may have little or no effect on the risk of falling (RR 0.95, 95% CI 0.90 to 1.01; $I^2 = 55\%$; 38 trials, 12,774 participants; low-certainty evidence). Multifactorial interventions versus exercise The evidence on falls rate and risk of falling is very uncertain (very low-certainty evidence). Risk of recurrent falls was not evaluated. Multifactorial interventions versus falls advice or education Multifactorial interventions provide no additional benefit and probably increase falls rate by a small amount (RaR 1.09, 95%

CI 1.00 to 1.18; $I^2 = 27\%$; 7 trials, 9901 participants; moderate-certainty evidence). They probably have little or no effect on the risk of falling (RR 0.99, 95% CI 0.93 to 1.05; $I^2 = 0\%$; 7 trials, 8850 participants; moderate-certainty evidence) and recurrent falls (RR 0.99, 95% CI 0.89 to 1.10; $I^2 = 0\%$; 3 trials, 7865 participants; moderate-certainty evidence). Multiple component interventions versus usual care or attention control Multiple component interventions may have little or no effect on falls rate (RaR 0.91, 95% CI 0.80 to 1.04; $I^2 = 72\%$; 14 trials, 4026 participants; low-certainty evidence) and may reduce the risk of falling (RR 0.88, 95% CI 0.80 to 0.97; $I^2 = 54\%$; 19 trials, 6925 participants; low-certainty evidence). We are uncertain if they reduce the risk of recurrent falls (very low-certainty evidence). Multiple component interventions versus exercise Multiple component interventions may have little or no effect on falls rate (RaR 0.91, 95% CI 0.80 to 1.04; $I^2 = 54\%$; 8 trials, 2160 participants; low-certainty evidence) and recurrent falls (RR 0.97, 95% CI 0.69 to 1.35; $I^2 = 21\%$; 5 trials, 874 participants; low-certainty evidence). They likely have little or no effect on the risk of falling (RR 0.97, 95% CI 0.90 to 1.05; $I^2 = 0\%$; 10 trials, 2920 participants; moderate-certainty evidence). Multiple component interventions versus falls advice or education Multiple component interventions may have little or no effect on falls rate (RaR 0.96, 95% CI 0.85 to 1.08; $I^2 = 75\%$; 7 trials, 9313 participants; low-certainty evidence) and risk of falling (RR 1.05, 95% CI 0.95 to 1.17; $I^2 = 60\%$; 8 trials, 9355 participants; low-certainty evidence). They likely have little or no effect on recurrent falls (RR 0.93, 95% CI 0.83 to 1.05; $I^2 = 18\%$; 6 trials, 8725 participants; moderate-certainty evidence). Adverse effects Adverse effects across all six comparisons were generally mild, indicating that both interventions were safe and well-tolerated.

Authors' conclusions: Multifactorial interventions may slightly reduce falls rate and the risk of recurrent falls, but may have little or no effect on the risk of falling, compared with usual care or attention control. When compared with exercise, their effects on falls rate and risk of falling are uncertain. Multifactorial interventions provide no additional benefit for falls rate and probably have little or no effect on the risk of falling and recurrent falls when compared with falls advice or education. Multiple component interventions may have little or no effect on falls rate compared with usual care or attention control, exercise, or falls advice or education. They may also have little or no effect on the risk of falling compared with usual care or attention control or falls advice or education, and on the risk of recurrent falls compared with exercise. Multiple component interventions probably have little or no effect on the risk of falling compared with exercise and on the risk of recurrent falls compared with falls advice or education. The effect on recurrent falls compared with usual care or attention control is very uncertain. The certainty of evidence for most comparisons was limited by risk of bias and statistical heterogeneity.

Funding: NIHR Exeter Biomedical Research Centre, Dennis and Mireille Gillings Foundation, Bateman Family Charitable Trust, NIHR SPCR Post-doctoral fellowship.

Registration: Not applicable.

Falls Research – September

Rationale, Design, and Baseline Characteristics of the TARGET (Targeted Assessment and Recruitment of Geriatrics for Effective Fall Prevention Treatments) Cohort of Older Adults for Assessing Fall and Fracture Risk: Prospective Cohort Study

Chan A, Visaria A, Malhotra R, Singh NB, Helgason B, Schinazi VR, Tan KY, Matchar DB, Sim R, Koh VJW, Lai WX, Troeung L, Lim CWH, Pai SGS, Tan KZ, Praveen AD, Jha D, Ferguson SJ, Colombo G, Minta K, Lamoureux EL, Taylor WR. JMIR Aging. 2026 Sep 25;9:e89285.

DOI: [10.2196/89285](https://doi.org/10.2196/89285)

PMID: 42789327

Abstract

Background: Falls and fractures are a major clinical concern for older adults. International clinical guidelines recommend annual fall risk screening for all adults aged 60 years and older. However, existing falls risk-screening algorithms have shown limited sensitivity and specificity in detecting future falls. Emerging health technologies, including wearable sensors, in-silico finite element models (FEMs), and virtual reality (VR) technology, show promise in enhancing fall and fracture risk assessments by providing more personalized objective data to support targeted primary prevention. However, large-scale longitudinal studies are required to evaluate their predictive accuracy and cost-effectiveness for systematic community-based screening.

Objective: The TARGET (Targeted Assessment and Recruitment of Geriatrics for Effective Fall Prevention Treatments) study is an ongoing national prospective cohort study in Singapore designed to develop cost-effective and scalable frameworks for the early detection and prevention of falls and fractures using novel health technologies. This paper describes the rationale, design, and baseline characteristics of TARGET, and provides preliminary insights into how these novel technologies perform in discriminating between older adults with and with no history of falls at study baseline.

Methods: A total of 2291 community-dwelling Singapore residents aged ≥ 60 years were enrolled between 2022 and 2024. Participants underwent a comprehensive baseline fall risk assessment comprising (1) home-based interview to assess sociodemographic, anthropometric, cognitive, physical, functional, and psychosocial status; (2) gait assessment using wearable inertial measurement units (IMUs) motion sensors; (3) dual-energy X-ray absorptiometry and whole-body 3D scans to construct subject-specific FEMs; and (4) VR-based cognitive assessment to probe spatial navigation deficits. Prospective follow-up for 2 years is ongoing, with linkage to national electronic medical records (EMRs) to obtain detailed clinical, medication, and pathological data.

Results: Of the total cohort, 58% (1327/2291) were female, with a mean age of 74.6 years at baseline. TARGET represents a relatively healthy older adult population, with 83% (1898/2291) remaining fully independent, 44% (1016/2290) with mild cognitive impairment, 50% (440/879) with osteopenia, and 15% (358/2291) reporting falls in the past year. Significant baseline functional, psychosocial, cognitive, and biomechanical differences were identified between fallers and nonfallers. Fallers had poorer physical and psychosocial health, greater gait variability, and a higher risk of osteoporotic fractures. Novel risk prediction models integrating

epidemiological, IMUs, FEM, VR, and EMR data are in development and being validated against gold standard clinical assessments, with cost-effectiveness evaluations of the economic feasibility of adopting these screening measures at scale.

Conclusions: Leveraging comprehensive epidemiological, EMR, and health technology data, TARGET is well positioned to identify novel biomarkers and systemic interactions that may predict falls and fracture risk, with potential application to other age-related diseases with shared pathophysiology. In particular, TARGET's focus on community-based screening using technologies that can be administered by nonclinical personnel has the potential to reduce substantial burden and costs within the health care sector.

Keywords: aging; falls; fractures; health technology; population health; predictive algorithms.

Exploration of the correlation between subjective and objective balance indicators in older adults with falls

Cui Y, Liu B, Zhou J, Liu Q, Ye H, Qin M. J Pak Med Assoc. 2026 Aug;76(8):1226-1231.

DOI: [10.47391/JPMA.22176](https://doi.org/10.47391/JPMA.22176)

PMID: 42703107

Abstract

Objectives: To precisely determine the correlation between subjective and objective balance indicators among older adults having experienced falls.

Methods: The cross-sectional, comparative study was conducted at the Geriatric Outpatient Clinic and Rehabilitation Department of Beijing Tongren Hospital, Capital Medical University, Beijing, China, from January 2022 to January 2023, and comprised elderly patients who were divided into falls group A and no-falls group B, based on whether the selected individuals had experienced one or more falls in the preceding year. The patients were subjected to the Short Physical Performance Battery and Computer Dynamic Posturography testing. Data was analysed using SPSS 22.

Results: Of the 266 patients, 131(49.2%) were in group A; 89(68%) males and 42(32%) females with mean age 81.38 ± 7.30 years. There were 135(50.8%) patients in group B; 100(74%) males and 35(26%) females with mean age 79.66 ± 8.26 years ($p > 0.05$). SPPB, VIS, VEST, SOT-COM, EPE, MXE and DCL scores were lower in group A compared to group B ($p < 0.05$). SPPB was positively correlated with SOT-COM ($r = 0.254$, $p < 0.001$), VIS ($r = 0.220$, $p < 0.001$), VEST ($r = 0.246$, $p < 0.001$), MVL ($r = 0.247$, $p < 0.001$), EPE ($r = 0.370$, $p < 0.001$), MXE ($r = 0.399$, $p < 0.001$), and DCL ($r = 0.233$, $p < 0.001$). Binary logistic regression confirmed VEST (OR: 1.019, 95%CI: 1.008-1.030, $p < 0.001$) and MXE (OR: 1.041, 95%CI: 1.012-1.072, $p = 0.006$) as independent positive predictors of SPPB.

Conclusions: Better physical function and improved visual/vestibular senses were found to be associated with lower fall risk in older adults. The integration of subjective and objective balance indicators could yield a more comprehensive and precise assessment.

Keywords: Aged, Accidental falls, Short Physical Performance Battery, Computerised dynamic posturography, Balance.

Incident Falls Across Concordant and Discordant Profiles of Concerns About Falling and Functional Mobility in Older Adults: A Prospective Cohort Study

Fei F, Zhong J, Guo L, You L, Zhao M. Clin Interv Aging. 2026 Sep 3;21:620118.

DOI: [10.2147/CIA.S620118](https://doi.org/10.2147/CIA.S620118)

PMID: 42708074

Abstract

Background: Concerns about falling and impaired functional mobility are established fall-risk indicators, but prospective fall risk is less clear when subjective concerns and objective mobility are discordant. We compared incident falls across joint profiles of concerns about falling and Timed Up and Go (TUG) performance, with particular attention to older adults with fast TUG performance and concerns versus those with slow TUG performance and no concerns.

Methods: This one-year prospective cohort study included 2,445 community-dwelling adults aged 60-79 years in Zhejiang Province, China. TUG performance was classified as fast (<12 s) or slow (≥12 s), and concerns about falling were assessed using a single yes/no item. Crossing the two measures produced four psychophysical groups. Self-reported falls were recorded on daily calendars and ascertained monthly. Cox regression estimated adjusted hazard ratios (HRs) for time to first fall. Sensitivity analyses used the Falls Efficacy Scale-International (FES-I), excluded participants with a baseline fall history, and applied the guideline-aligned TUG >15 s threshold.

Results: During follow-up, 232 participants (9.5%) reported at least one fall; 2,420 (98.98%) completed follow-up. Single-item concerns (adjusted HR 1.60, 95% CI 1.23-2.09) and slow TUG performance (HR 1.46, 95% CI 1.10-1.92) were independently associated with incident falls. Using the slow-TUG/no-concern group as the direct reference, the fast-TUG/concern group did not differ significantly (HR 1.08, 95% CI 0.72-1.63), whereas the slow-TUG/concern group had a higher hazard (HR 1.96, 95% CI 1.29-2.97). The discordant groups also did not differ after excluding baseline fallers (HR 0.97, 95% CI 0.62-1.52) or after additionally applying the TUG >15 s threshold (HR 0.87, 95% CI 0.46-1.63).

Conclusion: Concerns about falling and TUG performance provided complementary information about subsequent falls. The two discordant profiles were not significantly separated. These findings support considering concerns alongside mobility performance rather than relying on either measure alone.

Keywords: concerns about falling; functional mobility; incident falls; older adults; prospective cohort; timed up and go.

Effects of exercise interventions on fall-related injuries in community-dwelling older adults: an updated systematic review and meta-analysis

Ge B, Luo J, Cheng X, Wang D, Liu R, Liao X. Front Public Health. 2026 Aug 26;14:1916495.

DOI: [10.3389/fpubh.2026.1916495](https://doi.org/10.3389/fpubh.2026.1916495)

PMID: 42718525

Abstract

Background: Exercise interventions are widely recommended for preventing falls in older adults in the community; however, existing evidence regarding their effectiveness in reducing fall-related injuries remains inconsistent. This updated systematic review and meta-analysis aimed to assess the impact of exercise interventions on fall-related injuries in older adults in the community.

Methods: PubMed, Embase, Cochrane Library, and CINAHL databases were systematically searched from inception to April 2, 2026. Included studies were randomized controlled trials of exercise interventions for older adults in the community. Outcome measures included all fall-related injuries, injuries requiring medical attention, severe injuries, and fall-related fractures. Pooled risk ratios (RRs) and 95% confidence intervals (CIs) were calculated using a random-effects model. Risk of bias was assessed using the Cochrane RoB 2 tool, and the quality of evidence was assessed using the GRADE method. This review followed the PRISMA 2020 guidelines and was registered in PROSPERO (CRD420261348337).

Results: 29 randomized controlled trials involving 6367 participants were included. Exercise intervention significantly reduced the incidence of all fall-related injuries based on 19 studies [RR = 0.87, 95% CI (0.80, 0.95), $I^2 = 15.7\%$], injuries requiring medical attention based on 11 studies [RR = 0.71, 95% CI (0.57, 0.89), $I^2 = 33.3\%$], severe injuries based on 8 studies [RR = 0.67, 95% CI (0.54, 0.83), $I^2 = 0.0\%$], and fall-related fractures based on 11 studies [RR = 0.56, 95% CI (0.37, 0.85), $I^2 = 23.3\%$]. Heterogeneity among outcome measures was low to moderate.

Conclusion: Exercise intervention can effectively reduce the incidence of fall-related injuries and fractures in older adults in the community and may contribute to healthy aging and injury prevention. Keywords: exercise; falls; fractures; older adults; injury prevention; meta-analysis.

Systematic review registration: PROSPERO, identifier [CRD420261348337].

Keywords: exercise; falls; fractures; injury prevention; meta-analysis; older adults.

Artificial Intelligence in Extended Reality and Digital Rehabilitation Technologies for Fall Prevention in Older Adults: A Rapid Review of the Evidence

Haris M, Martins BA, Cai B, Dueck B, Elliott B, Gibbons J, Park M, Lê ML, Peng K, Moussavi Z, Pangandaman H, Veras M. NeuroRehabilitation. 2026 Sep 17:10538135261488430.

DOI: [10.1177/10538135261488430](https://doi.org/10.1177/10538135261488430)

PMID: 42754841

Abstract

Background Fall-related injuries in older adults remain a major health concern, contributing to functional dependence and healthcare losses. Traditional prevention programs, while effective, remain underutilized due to poor adherence and participation. Extended reality (XR) technologies, combined with artificial intelligence (AI), are emerging as promising solutions to mitigate fall-related outcomes.

Objective To evaluate existing literature on extended (XR) and virtual reality (VR) based interventions and the role of AI in improving balance, mobility and fall outcomes among older adults.

Methodology A rapid review was conducted using Cochrane Rapid Review methods and conducted in Ovid MEDLINE, Scopus, and IEEE Xplore. Studies meeting eligibility criteria were screened and extracted using Covidence. Data on study design, participant characteristics, intervention components, outcome measures, and key findings were extracted and synthesized, narratively with attention to AI use within XR interventions. Results After dual screening, four studies met the inclusion criteria. XR and VR interventions showed improvements in mobility, movement quality and muscular strength. Two studies used AI primarily for movement classification and postural control analysis. One exergame study without AI showed mixed results. Participant engagement was generally high, with low dropout rates. Most full-text exclusions were due to absence of AI methods, highlighting the limited AI-specific evidence base. No study measured fall incidence directly.

Conclusion This rapid review highlights the effectiveness of XR interventions in enhancing mobility and participant adherence. However, evidence is limited as the available publications remain preliminary and do not demonstrate fall reduction and the added benefits of AI. Larger, well-designed studies are needed to establish the clinical value of these technologies.

Keywords: artificial intelligence; extended reality (XR); fall prevention; older adults; rapid review; rehabilitation; virtual reality.

Preparing for Delivery of Patient Falls Prevention Education in Hospitals: The Consumer Perspective

Heng H, Francis-Coad J, Bulsara C, Loo CY, Morris ME, Semciw A, Said CM, Peterson S, Hill AM. Health Expect. 2026 Oct;29(5):e70878.

DOI: [10.1111/hex.70878](https://doi.org/10.1111/hex.70878)

PMID: 42765165

Abstract

Background: Falls in hospital are a serious risk to older patients' recovery. Patient education programmes that provide falls prevention advice are recommended. Garnering the perspectives of older adults about implementing such programmes could improve how health professionals engage with hospital patients to educate them and increase patient enactment of falls prevention advice.

Methods: Two forums, in two states of Australia, were conducted using a modified World Café methodology. Older consumers who had previous admissions to hospital shared their perspectives on three conversation topics: (i) delivery of a purpose-designed patient falls prevention education programme called Safe Recovery; (ii) ward-level support for programme delivery; and (iii) organisational-level support for the programme. Table notes were combined and analysed using inductive content analysis.

Results: Older consumers who could communicate in English from Western Australia (n = 17) and Victoria (n = 16) participated in the forums. Their perspectives appeared to concur that implementation of the Safe Recovery Programme for falls prevention on hospital wards requires staff attention to the right timing for patients, personalisation of the education and multiple modes of delivery to optimise programme exposure. Consumers advised that ward-level support to remember and enact suitable strategies should be provided by staff, families, hospital volunteers and peers. They requested clear communication between staff that ensured they repeatedly and consistently reinforced patient participation and provided progress reports to patients on falls prevention. Organisations can support implementation by taking ownership for ensuring patients receive falls prevention education, endorse staff falls education training and allocate funding for programme sustainability. The group consensus was everyone can work together to prioritise falls prevention in hospitals.

Conclusion: Older consumers expressed their enthusiasm to partner in planning how a patient falls prevention education programme is delivered on hospital wards. Consumer engagement can provide valuable stakeholder feedback about processes and resources required for delivery of patient falls prevention education, which may lead to successful delivery by hospitals.

Patient or public contribution: The research team includes a consumer investigator (SP) who has provided feedback and input at all stages of the research, including project design, study procedures, data analysis and manuscript review. The education programme's original design and development was centred around patient and public involvement. The participants in this study who attended the world café forums were older people with lived experience of hospital admissions and caregivers of older people admitted to hospital.

Keywords: accidental falls; consumer engagement; implementation; older adults; patient education; prevention; safety in hospitals.

Development of a Wearable Sensor Platform for Fall Risk Assessment and Fall Detection

Imperato A, Caporaso M, Pascalis V, Di Gironimo G, Lanzotti A, Grazioso S, Palomba A, Caporaso T. Sensors (Basel). 2026 Sep 16;26(18):5867.

DOI: [10.3390/s26185867](https://doi.org/10.3390/s26185867)

PMID: 42817379

Abstract

Objective: Falls among the elderly constitute a major global public health issue. Research has therefore focused on two complementary areas: fall risk prevention and fall detection. Existing solutions mainly rely on body-attached sensors confined to laboratory settings, whereas recent research has shifted toward wearable e-textiles with non-invasive, long-term-wear sensors. In this context, the study presents a wearable sensor platform to both predict fall risk and detect falls, based on sensorized clothing integrating inertial measurement units and surface electromyography sensors. **Methods:** Fall risk was estimated from gait parameters extracted during a 10 m walking test as the probability of belonging to a faller (vs. non-faller) group, using a logistic regression model trained on the G-STRIDE dataset, complemented by neuromuscular parameters extracted from sEMG and associated with fall risk. Fall detection, focused on improving pre-impact identification, was framed as a binary classification between activities of daily living and falls, using a reduced Spatio-Temporal Attention Network trained on the FallTL dataset and refined with our own platform's data. **Results:** The obtained results were: fall-risk assessment, Area Under the Curve = 77.8%, Accuracy = 68.7%; fall detection, Accuracy = 96.7%, F1 Score = 77.3%, lead time = 390 ms. **Conclusions:** As a single-subject proof of concept, these results support the feasibility of a unified platform integrating objective fall-risk screening and fall event identification, with a predicted time before impact suitable for protective systems intervention; validation on a larger, representative cohort is required before any clinical claim can be made.

Keywords: deep learning; fall detection; fall prevention; inertial measurement units; machine learning; smart clothing; surface electromyography.

Predicting first falls among older adults with chronic conditions and polypharmacy using routinely collected health records

Larrañaga I, Rujas M, Alayo I, Erreguerena I, Capo M, Lopez-Perez L, Mediavilla MM, Martínez MD, Chuliá-Gil H, Georga EI, Haleem MS, Pecchia L, Fotiadis DI, Fico G, Fullaondo A. Front Artif Intell. 2026 Sep 4;9:1852439.

DOI: [10.3389/frai.2026.1852439](https://doi.org/10.3389/frai.2026.1852439)

PMID: 42761171

Abstract

Background: Falls represent a major clinical and financial challenge for healthcare systems. Accurately predicting first falls remains challenging, especially when using routinely collected data.

Objective: Develop and evaluate a predictive model to identify elderly people at risk of first fall-defined as a fall after a 90-day fall-free period-in the Basque Country using routinely collected health records.

Method: A retrospective study included patients aged ≥ 65 with at least two chronic conditions among heart failure, chronic obstructive pulmonary disease (COPD), and diabetes. Data on demographics, diagnoses, prescriptions and healthcare utilisation were obtained from Osakidetza-Basque Health Service databases. Patients were labelled as "fallers" if they fell during 2022-2023 after a 90-day fall-free period rather than a true first-ever fall. Predictive models-logic regression (LR), random forest (RF), and extreme gradient boosting (XGB)-were trained using recursive feature elimination with cross-validation (RFECV). Shapley additive explanations (SHAP) enhanced model interpretability and explainability.

Results: 35,197 patients were included, with 10.6% experiencing a fall. All models achieved similar results, with an AUCROC score of 0.71, while precision remained low. Emergency room visits in the prior 3 months, presence of caregiver, and age consistently ranked the top predictors. The number of prescriptions and antidepressant use also emerged as relevant.

Discussion: Models showed moderate predictive performance. Relying solely on routinely collected health records limited clinical applicability due to low precision. Future work should integrate diverse data sources-health records, real-time gait and balance metrics, environmental factors-to improve fall prediction and support clinical decision-making.

Keywords: artificial intelligence; chronic diseases; falls; first-fall prediction; machine learning; polypharmacy; predictive modelling.

Disseminating Stepping on Across Wisconsin and Nationally: A Multiyear Case Study

Mahoney JE, Morley SI. Clin Geriatr Med. 2026 Nov;42(4):631-644.

DOI: [10.1016/j.cger.2026.08.002](https://doi.org/10.1016/j.cger.2026.08.002)

PMID: 42833802

Abstract

Stepping On is an evidence-based, 7-week, small group falls prevention program for older adults at risk for falls, which has been disseminated widely across the United States. This article describes the program's format and conceptual underpinnings, the research demonstrating its effectiveness, and the steps taken to ensure adaptability and fidelity with its delivery by trained facilitators affiliated with organizations providing services to community-dwelling older adults.

Keywords: Dissemination; Falls prevention; Implementation; Preventing falls; Stepping on.

Ageism as an Upstream Determinant: A Three-Level Framework for Reframing Fall Prevention

McMahon SK, Kiyoshi-Teo H, Moone R. Clin Geriatr Med. 2026 Nov;42(4):599-615.

DOI: [10.1016/j.cger.2026.06.003](https://doi.org/10.1016/j.cger.2026.06.003)

PMID: 42833800

Abstract

Falls among older adults remain a major public health issue despite strong evidence supporting prevention strategies. Rising mortality and costs highlight a gap between knowledge and implementation. This gap is partly driven by ageism, which operates at structural, interpersonal, and individual levels, influencing how fall prevention is implemented, received, and adopted. Factors such as underreporting, environmental barriers, and internalized stigma reduce effectiveness. The article argues for a holistic, multilevel approach that integrates social determinants of health, especially ageism. Using frameworks like Reframing Aging, it recommends systemic, clinical, and communication changes to improve prevention, engagement, and safe mobility for older adults.

Keywords: Accidental falls; Ageism; Built environment; Clinical communication; Fall prevention; Older adults; Reframing aging; Social determinants of health.

Exploring successful implementation of occupational therapy led home fall-hazard reduction interventions

Melchert S, Franklin R, Lowrie D. Aust Occup Ther J. 2026 Oct;73(5):e70123.

DOI: [10.1111/1440-1630.70123](https://doi.org/10.1111/1440-1630.70123)

PMID: 42683822

Abstract

Introduction: Falls among older adults are a major cause of death, injury, and loss of independence. High-certainty evidence demonstrates that comprehensive, occupational therapy-led home fall-hazard reduction interventions can reduce the number of falls among older adults at high risk. Despite this evidence, these interventions are not routinely implemented in practice. Current literature provides limited insight into the factors that influence successful implementation of home fall-hazard reduction interventions. This study seeks to address the following research question: 'What influences the success of occupational therapy-led, home fall-hazard reduction intervention implementation from the perspectives of academic and practising therapists with expertise and experience in this field?'

Methods: Using a descriptive qualitative design, data were gathered via two small group interviews and one individual interview with occupational therapists experienced in implementing home fall-hazard reduction initiatives. Participants were purposively sampled to ensure data collection from participants with relevant experience, either as an academic or practising therapist. Data were analysed using reflexive thematic analysis to identify factors influencing successful implementation.

Consumer and community involvement: There was no consumer or community involvement.

Findings: Five academics and four practising therapists were interviewed. Four interconnected themes were derived from the data: (1) multiple and layered measures of implementation success; (2) foregrounding falls prevention; (3) articulating a place for home fall-hazard reduction in the falls prevention landscape; and (4) structured guidance and protocols. The interrelated nature of the themes has been illustrated in a theoretical conceptual model.

Conclusion: The findings suggest that attending to the multiple measures of implementation success for home fall-hazard reduction intervention, particularly those that are context driven, may strengthen uptake across diverse practice settings. Furthermore, maximised success in implementation requires clear guidance on intervention components, improved articulation of intervention fit within the wider fall prevention landscape, and targeted support to enable occupational therapists to foreground falls prevention in practice.

Keywords: accidental falls; community health; fall prevention; home fall-hazard reduction intervention; implementation science.

The 2025 National Falls Prevention Action Plan: A Road Map for Reducing Older Adult Falls Through Multisector Collaboration and Clinical-Community Linkages

Nabors E, Ring V, Zahm K, Vafiadis D. Clin Geriatr Med. 2026 Nov;42(4):617-630.

DOI: [10.1016/j.cger.2026.08.001](https://doi.org/10.1016/j.cger.2026.08.001)

PMID: 42833801

Abstract

Older adult falls are a common and costly issue that threatens older adult well-being and burdens health care systems. The 2025 National Falls Prevention Action Plan provides a framework for action to reduce older adult falls. The Plan was developed through extensive surveys of professionals and a nationwide summit. Underscoring the need for a multisector commitment to falls prevention, it reflects input from hundreds of professionals across the aging, disability, housing, government, technology, research, and advocacy sectors. This article presents the plan's strategies with recommendations for incorporation into clinical practice and partnership with community organizations.

Keywords: Clinical-community linkages; Evidence-based programs; Falls prevention; Falls risk factors; National strategy; Referrals; Screening and assessment.

Short-Term Versus Long-Term Perturbation-Based Balance Training Program on Balance Function-A Secondary Analysis of Two Randomized Controlled Trials

Nachmani H, Paran I, Salti M, Shelef I, Berdichevsky Y, Schwenk M, Melzer I. J Aging Phys Act. 2026 Sep 8:1-6.

DOI: [10.1123/japa.2025-0225](https://doi.org/10.1123/japa.2025-0225)

PMID: 42716502

Abstract

Introduction: Perturbation-based balance training (PBT), which involves repeated exposure to unannounced balance challenges, has been shown to reduce fall risk in older adults. However, the optimal duration of PBT interventions to achieve generalized improvements in balance remains unclear.

Aims: This study aimed to compare the effects of 1-month versus 3-month PBT programs on reactive stepping, voluntary stepping, and postural control in older adults.

Methods: We conducted a secondary analysis of two randomized controlled trials including 40 community-dwelling older adults (aged ≥ 70), divided equally into 1- and 3-month PBT groups. Both groups received multidirectional treadmill-based perturbation training. Pre- and postintervention assessments included reactive stepping responses, voluntary stepping under single- and dual-task conditions, and quiet stance postural sway measures. Two-way repeated-measures analyses of variance and effect sizes were used to evaluate group-by-time interactions.

Results: Both training intervention durations significantly improved participants' ability to withstand higher perturbation magnitudes (~65%-70%) without improvements in reactive step kinematics. However, only the 3-month group demonstrated significant improvements in voluntary stepping speed in standing and postural sway measures.

Discussion and conclusion: While a 1-month PBT was sufficient to enhance reactive fall resistance, only the 3-month program led to broader transfer effects to voluntary balance and "static postural control." A 1-month PBT intervention can effectively enhance reactive balance control, but longer training durations may be necessary to achieve generalized improvements in balance control and voluntary step movements relevant to fall prevention in older adults.

Keywords: fall prevention; falls; old adults; reactive balance.

Lessons Learned in the Early Adoption of FaME Across Ireland: A Convergent Mixed-Methods Implementation Study (FaME Ireland)

Rooney S, Ahern L, Brennan E, Cahalane E, Cummins V, Eldridge C, Horgan F, Skelton DA, Shé ÉN, Thackeray K, Vig B, McCullagh R. Health Expect. 2026 Oct;29(5):e70860.

DOI: [10.1111/hex.70860](https://doi.org/10.1111/hex.70860)

PMID: 42703930

Abstract

Background: Falls are the most common cause of hospitalisation amongst older adults in Ireland. Structured exercise programmes are recommended to manage falls, and the Falls Management Exercise (FaME) programme has been shown to reduce falls and improve physical function. However, FaME delivery within an Irish context needs to be explored to ensure it is implemented effectively and equitably.

Objective: To explore key stakeholders' experiences and examine key outcomes during the early adoption of the FaME programme across three sites in Ireland.

Design: A convergent mixed-methods design was used to explore the early adoption of FaME across three sites in Ireland (Dublin, Kerry, and Sligo/Leitrim). Focus groups and interviews were conducted with key FaME stakeholders (clients, Postural Stability Instructors, service managers) to understand the experiences of local implementation. Baseline and outcome measures of falls and physical function contextualised the qualitative findings.

Results: A census sample across the three study sites, 64 FaME Clients, 10 PSIs, and seven Service Managers were included. Themes described the Reach, Effectiveness, Adoption, Implementation, and Maintenance of FaME according to the RE-AIM framework. All groups recorded improvements in physical function following FaME.

Conclusions: This study highlights factors influencing the adoption of FaME within an Irish context and provides recommendations for future implementation. To ensure effective and sustainable delivery, commissioners should consider how FaME can be embedded within exercise and falls management pathways and establish partnerships with local community organisations to support service delivery.

Patient or public contribution: Public representatives from Age and Opportunity (n = 16), a national organisation that advocates for valuable activities and services as we age, and clients of FaME (n = 4) were involved in the early protocol planning, scheduled meetings, co-design phases, and analysis stages of the study. Their contribution influenced issues such as accessibility and acceptability of strength and balance programmes and options for dissemination. Representatives from Age and Opportunity reviewed the manuscript for readability.

Keywords: Falls Management Exercise (FaME); falls prevention; mixed methods; older adults.

Pharmacological stratification of fall-risk-increasing drugs for prevention of fall-related injuries in older adults: a population-based cohort study

Schechner M, Rottenkolber M, Oehler P, Guthrie B, Grill E, Hoffmann S, Piller J, Bender A, Dreischulte T. Age Ageing. 2026 Sep 4;55(9):afag280.

DOI: [10.1093/ageing/afag280](https://doi.org/10.1093/ageing/afag280)

PMID: 42765722

Abstract

Background: Falls are a major cause of morbidity among older adults. While deprescribing fall-risk-increasing drugs (FRIDs) is recommended for secondary prevention, their high prevalence limits efficient targeting in primary prevention. Stratification by pharmacological FRID subclasses or drugs with fall-risk-increasing adverse reactions (FRIAR-drugs) may improve identification of high-risk patients, yet its added value in routine care is uncertain.

Objective: To compare pharmacological FRID classifications with a FRIAR-based framework for predicting fall-related hospitalisations and to identify drug subgroups that differentiate fall-risk among exposed older adults in a primary prevention context.

Methods: We conducted a retrospective cohort study including 120 867 adults aged ≥ 65 years prescribed at least one FRID or FRIAR-drug at baseline. Fall-related hospitalisations in 2019 were identified using International Classification of Diseases, 10th Revision (ICD-10) codes. Multivariate logistic regression evaluated pharmacological FRID (sub)groups and FRIAR-drug classifications, adjusted for established general predictors. Model performance was assessed using internal validation and sensitivity analyses.

Results: During follow-up, 2788 individuals (2.3%) experienced a fall-related hospitalisation. Pharmacological subgroups associated with higher risk included serotonin reuptake inhibitors, older antiepileptics and drugs with moderate anticholinergic properties. In contrast, the FRIAR-drug framework added little prognostic information beyond established FRID classifications. The final model demonstrated moderate discrimination (Area under the curve (AUC) 0.73) with stable predictive performance on internal validation.

Conclusion: Pharmacological stratification of FRIDs allows clinically useful differentiation of fall-risk among exposed older adults, whereas FRIAR-based classification adds limited prognostic value. These findings support more selective prioritisation of medication review in primary-preventive fall strategies, although external validation and evaluation of decision-relevant risk stratification are required.

Keywords: fall-risk-increasing adverse reactions; fall-risk-increasing drugs; falls; older adults; prediction.

Fall-Related Physical Function, Executive Function, and Myokine Responses in Older Women with Obesity Participating in a 16-Week Combined Aquatic Exercise Program: A Prospective Observational Study

Seo YM, So WY, Kim KL, Lee YH. Medicina (Kaunas). 2026 Aug 31;62(9):1667.

DOI: [10.3390/medicina62091667](https://doi.org/10.3390/medicina62091667)

PMID: 42796274

Abstract

Background and Objective: Aquatic exercise may be an effective strategy for promoting healthy aging among older women with obesity because it reduces joint loading while improving physical and functional capacity. In this prospective observational study, we examined longitudinal changes in fall-related physical function, executive function, and circulating myokine levels among older women with obesity according to their participation in a 16-week combined aquatic exercise program.

Materials and Methods: Thirty older women with obesity were included in this prospective observational study and classified into an aquatic exercise group ($n = 15$) or a comparison group ($n = 15$) according to their participation in an existing community-based aquatic exercise program. Group membership was not assigned by the researchers. Participants in the aquatic exercise group attended the 16-week program, whereas those in the comparison group maintained their usual daily activities. Fall-related physical function, executive function, and circulating levels of the myokines irisin and interleukin-6 (IL-6) were assessed at baseline and at Weeks 8 and 16. Descriptive statistics were used to summarize participant characteristics, and two-way repeated-measures analyses of variance were performed to examine group differences, changes over time, and group $\times$ time interactions. When significant group $\times$ time interactions were observed, planned contrast analyses were conducted to examine changes across measurement time points. Statistical significance was set at $p < 0.05$.

Results: Compared with the comparison group, the aquatic exercise group exhibited greater longitudinal improvements in several measures of fall-related physical function, including body composition, muscular function, and balance. However, no significant group $\times$ time interactions were observed for gait speed or endurance. Executive function demonstrated a significant group $\times$ time interaction ($p < 0.001$). Among the assessed myokines, irisin demonstrated a significant group $\times$ time interaction ($p = 0.002$), whereas IL-6 did not ($p = 0.372$), although IL-6 levels tended to decrease in the aquatic exercise group. **Conclusions:** Participation in the 16-week combined aquatic exercise program was associated with favorable longitudinal changes in several measures of fall-related physical function, executive function, and circulating irisin levels among older women with obesity. No significant group $\times$ time interactions were observed for gait performance or IL-6 levels. These findings suggest that participation in a community-based combined aquatic exercise program may be associated with favorable changes in selected indicators of healthy aging among older women with obesity.

Keywords: combined aquatic exercise; executive function; fall-related physical function; healthy aging; irisin; myokines; obesity; older women.

Neural Correlates of Fall Risk in People Aged 50 and Over With Chronic Low Back Pain: A Multimodal MRI Study

Seydi M, Delbaere K, Ambrens M, Richardson JK, Rae CD, Cao J, Sachdev PS, Lavrencic L, Green MA, van Schooten KS. Eur J Pain. 2026 Sep;30(8):e70380.

DOI: [10.1002/ejp.70380](https://doi.org/10.1002/ejp.70380)

PMID: 42730496

Abstract

Background: Chronic low back pain (CLBP) is common in older people and contributes to disability, physical inactivity, cognitive deficits and neural alterations that may increase fall risk. We examined associations between multimodal brain measures and daily-life gait quality and other fall risk factors in older people with CLBP.

Methods: Thirty-three adults aged ≥ 50 years with CLBP completed assessments of physical function, physical activity, and executive function. Daily-life gait quality was assessed using a waist-worn accelerometer. Neuroimaging included diffusion MRI, T1-weighted MRI and magnetic resonance electrical properties tomography.

Results: Gait quality was associated with tissue conductivity in bilateral cerebellar white matter, pallidum and thalamus, but not with structural measures. Short Physical Performance Battery (SPPB) score was associated with fibre density in visual and thalamo-occipital tracts, and hippocampal, thalamic and putamen volumes. Walking duration and daily-life gait speed were associated with cerebellar and subcortical volumes and frontal-parietal conductivity. Physical activity was associated with hippocampal, cerebellar, parietal, and frontal conductivity. Inhibitory control was associated with sensorimotor fibre density and medial orbitofrontal conductivity.

Conclusions: In older people with CLBP, gait, physical function and executive function are supported by complementary neural networks, with tissue conductivity providing additional insight into real-world gait performance and physical function.

Significance statement: This study highlights brain mechanisms underlying fall risk in older people with chronic low back pain. Tissue conductivity in cerebellar, subcortical and orbitofrontal regions was linked to balance, gait quality and inhibitory control, providing insights beyond structural MRI. Findings suggest that alterations across neural circuits involved in motor control, cognitive processing and physical activity may contribute to mobility decline. Understanding these neural pathways may help guide targeted interventions to improve balance and reduce fall risk in people with chronic low back pain.

Keywords: chronic low back pain; cognitive-motor integration; executive function; fall risk; gait quality; multimodal MRI.

Balance bridges upstream deficits associated with falls in older adults: evidence from the National Health and Aging Trends Study Round 13 cohort

Shahsavarani S, Tai Y. Innov Aging. 2026 Jul 1;10(10):igag076.

DOI: [10.1093/geroni/igag076](https://doi.org/10.1093/geroni/igag076)

PMID: 42732430

Abstract

Background and objectives: Falls in older adults are a major public health concern, but the mechanistic pathways linking sensory, cognitive, and vascular deficits to falls are poorly understood. We hypothesized that balance acts as a critical mediator, channeling these upstream deficits into functional fall risk.

Methods: Using cross-sectional data from 4805 community-dwelling adults (≥ 65 years) in the National Health and Aging Trends Study (NHATS) Round 13, we examined predictors of a composite fall-risk score (self-reported past falls and worry about falling). Survey-weighted multiple regression identified direct predictors, while mediation analyses tested the indirect effects of hearing, cognition, and vascular conditions through subjective (self-reported problems) and objective (performance-based) balance measures.

Results: Subjective balance was the strongest direct predictor of fall risk ($\beta = 0.53$, $p < .001$), with additional direct effects from objective balance, depression, anxiety, and heart disease. Notably, hearing ability, cognitive function, and hypertension were not direct predictors of fall risk; their influence was fully or partially mediated by balance, establishing postural control as the primary pathway through which these upstream factors contribute to falls.

Discussion and implications: These findings identify a dual-pathway fall risk model driven by subjective and objective balance. While psychological factors and heart disease directly influence fall risk, upstream sensory, cognitive, and hypertensive deficits operate through balance as a convergent mediating pathway. Clinical fall prevention must prioritize subjective and objective balance measures, while managing mental health as a direct threat and addressing sensory and cognitive function as foundational to postural control.

Keywords: Cognition; Hearing; Hypertension; Mental health; Postural control.

Promoting Older Adults' Participation in Fall Prevention Activities

Sheridan E, Wiseman JM, Krok-Schoen JL, Dabelko-Schoeny HI, Jarrott SE. Clin Geriatr Med. 2026 Nov;42(4):677-689.

DOI: [10.1016/j.cger.2026.08.005](https://doi.org/10.1016/j.cger.2026.08.005)

PMID: 42833805

Abstract

Falls are a leading cause of injury and death among older adults, yet a persistent gap exists between available evidence-based prevention strategies and their real-world uptake. Social determinants of health shape fall risk as well as the accessibility and effectiveness of prevention interventions. Cohort evidence demonstrates that disparities in outcomes are intersectional and emerge at the community level, challenging current risk assessment tools and one-size-fits-all prevention approaches. Closing this gap requires further research, validated equity-informed assessment tools, and interventions matched to patients' social circumstances.

Keywords: Falls prevention; Health disparities; Health equity; Hip fracture; Intersectionality; Older adults; Social determinants of health.

Choosing Wisely in Hospital Fall Prevention: Reconsidering the Role of Alarms

Turner K, McNett M, Potter C, Cramer E, Mion LC, Shorr RI. Clin Geriatr Med. 2026 Nov;42(4):691-704.

DOI: [10.1016/j.cger.2026.06.002](https://doi.org/10.1016/j.cger.2026.06.002)

PMID: 42833806

Abstract

The authors conducted a review of fall prevention alarms in hospital settings. The review covers the evidence for fall prevention alarms and other fall prevention practices, factors that contribute to overuse of fall prevention alarms, and strategies that are being tested to de-implement fall prevention alarms. The review also provides an overview of low-value care and de-implementation science and how lessons learned from those fields can be applied to hospital fall prevention.

Keywords: De-implementation; Fall prevention; Geriatric nursing; Hospital falls; Hospitalized older adults; Implementation science; Inpatient falls; Patient safety.

Cost-effectiveness of an integrated falls prevention programme in primary healthcare for older people in rural China: an economic evaluation alongside the FAMILY trial

Wei T, Peng J, Ye P, Yan S, Li Z, Li Q, Meng R, Li Y, Hao T, Zhang L, Peng D, Nan B, Xu Z, Chen Y, Wang NY, Yang M, Yao Y, Zhang J, Xu L, Chen M, Kolt GS, Jan S, Tian W, Ivers R, Wang Y, Tian M, Si L. Age Ageing. 2026 Sep 4;55(9):afag282.

DOI: [10.1093/ageing/afag282](https://doi.org/10.1093/ageing/afag282)

PMID: 42784540

Abstract

Background: Falls and fall-related injuries are the leading cause of morbidity and mortality for older adults. For China's rapidly ageing population, the need for cost-effective falls prevention programmes is critical. FAMILY, a 12-month cluster randomised controlled trial in rural China (2610 community-dwelling older adults), demonstrated that a primary healthcare-integrated balance and functional exercise fall prevention programme reduced falls. This study assessed its cost-effectiveness.

Methods: A within-trial economic evaluation was conducted from a healthcare system perspective. Incremental cost and effectiveness (falls prevented and quality-adjusted life-years [QALYs]) were estimated using mixed-effects regression models accounting for clustering. Costs included healthcare resource use and intervention delivery. QALYs were derived from EuroQol 5-Dimension 5-level (EQ-5D-5L) instrument administered during the trial. Uncertainty was assessed using one-way and probabilistic sensitivity analyses with two-stage bootstrapping.

Results: During a mean follow-up of 358 days, the intervention was dominant, with lower costs and greater effectiveness. The intervention reduced the absolute risk of falls by 8.6% and increased QALYs by 0.024 per person. Mean cost savings of ¥293 (95% CI: -¥145 to ¥727) were observed in the intervention group. This difference was mainly driven by lower healthcare utilisation costs (¥1517 vs ¥1831), which more than offset the intervention cost of ¥20 per participant. The probability of the intervention being cost-saving was 90%, and the probability of being cost-effective was 96%.

Conclusions: A primary healthcare-integrated, falls prevention programme in rural China can improve health outcomes in older adults whilst reducing costs, providing a scalable solution for resource-constrained settings.

Keywords: community-based; cost-effectiveness; economic evaluation; falls; older people.

Adapting an Evidence-Based Fall Prevention Toolkit for Physical Therapists Practicing in Outpatient Rehabilitation Settings

Wingood M, Caulley JM, Council SK, Vincenzo JL. Clin Geriatr Med. 2026 Nov;42(4):645-662.

DOI: [10.1016/j.cger.2026.08.003](https://doi.org/10.1016/j.cger.2026.08.003)

PMID: 42833803

Abstract

Our article describes how the Centers for Disease Control and Prevention's Stopping Elderly Accidents, Deaths, and Injuries (STEADI) fall prevention initiative was adapted for outpatient physical therapy settings using the Framework for Reporting Adaptations and Modifications-Enhanced. The goal was to make STEADI more relevant and practical for physical therapists who play a key role in fall prevention for older adults. These adaptations did not impact STEADI's core elements, including (1) who receives the screening and additional assessments; (2) the use of the Stay Independent Questionnaire; (3) incorporation of balance and gait assessments; and (4) the use of an interprofessional team.

Keywords: Fall prevention; Physical therapy; Screenings.

Trends in Falls and Medicine Use in Australian Long-Term Care, 2014-2022: Evidence From 8298 Residents

Xu Y, Westbrook JI, Meulenbroeks I, Inacio MC, Caughey GE, Hibbert PD, Braithwaite J, Wabe N. *Australas J Ageing*. 2026 Sep;45(3):e70240.

DOI: [10.1111/ajag.70240](https://doi.org/10.1111/ajag.70240)

PMID: 42786600

Abstract

Objective(s): To evaluate changes in falls and medication-related quality indicators (QIs) including high sedative load, antipsychotic use and anti-anxiety or hypnotic medications in long-term care facilities (LTCFs), and to examine their alignment with major national reforms and COVID-19 in New South Wales, Australia.

Methods: A repeated cross-sectional study was conducted using electronic health data from 27 LTCFs (8298 residents). From Jul 2014 to Jun 2022, quarterly prevalence estimates of four QIs were evaluated adjusting for potential confounders. Joinpoint regression analysis was used to identify QI trend changes. Average quarterly percentage changes for the study period were estimated.

Results: The quarterly prevalence of residents who had any falls (28.5%-33.3%) and injurious falls (14.5%-18.6%) remained stable during the study period. The prevalence of residents who had falls requiring hospitalisation varied (3.8%-9.1%) and average quarterly percentage increase was 1.01% (95% confidence interval (CI) 0.30, 2.08). There were changes in quarterly prevalence of residents experiencing high sedative load (28.1%-32.1%), using antipsychotic(s) (8.9%-19.3%), and anti-anxiety and hypnotic medication(s) (11.4%-19.0%). Average quarterly percentage decreases were at 0.17% (95% CI 0.01, 0.35) in residents experiencing a high sedative load, 2.14% (95% CI 1.90, 2.41) for antipsychotics use and 1.63% (95% CI 1.45, 1.82) for anti-anxiety or hypnotic medication use. Regarding trend changes, medication-related QIs decreased from Q3 or Q4 2018, or Q1 2019, around when the Royal Commission was established. Medication-related QIs continued to decline when restrictions on risperidone were applied and COVID-19 started.

Conclusions: Medication-related QIs decreased during the study period, especially after national reforms.

Keywords: accidental falls; antipsychotic agents; anti-anxiety agents; hypnotics and sedatives; long-term care.

Instrumented Walkway Gait Analysis Predicts Fallers in Neurological Disorders: Identifying Digital Biomarkers for Balance Monitoring

You VS, Barnard LR, Botha H, Jackson LM, Bower JH, Klassen BT, Elder BD, Graff-Radford J, Howe CL, Ali F. Sensors (Basel). 2026 Sep 5;26(17):5644.

DOI: [10.3390/s26175644](https://doi.org/10.3390/s26175644)

PMID: 42740264

Abstract

Assessing balance is crucial in neurological rehabilitation, yet while wearable sensors enable real-world monitoring, identifying reliable digital biomarkers remains challenging. This study utilized a high-fidelity instrumented walkway to determine which gait parameters best predict balance impairment, providing robust targets for future wearable applications. We analyzed 49 steady-state gait metrics from 140 individuals with diverse neurological conditions. Using statistical analysis and machine learning, we evaluated these parameters against objective force plate sway scores and clinical fall-history labels. Group analysis identified 16 parameters significantly distinguishing fallers from non-fallers, and a neural network classified fallers with an area under the curve of 0.75. Across all analytical approaches, overall gait variability, e.g., Stride Width S.D. and the Gait Variability Index, emerged as a universal predictor of balance impairment and fall risk. Furthermore, while traditional linear models emphasized spatial postural control, machine learning classification uniquely identified inter-limb asymmetry as a premier driver of fall prediction. These findings indicate that instrumented gait analysis effectively identifies digital biomarkers for balance deficits. Isolating these specific metrics provides a clear blueprint for meaningful metrics required for continuous objective monitoring and future development of personalized, adaptive rehabilitation strategies.

Keywords: balance impairment; fall risk; gait analysis; machine learning; neurological disorder; rehabilitation.