

**Hip fracture treatment and outcomes among community-dwelling people living with dementia**

Adler RR, Xiang L, Shah SK, Clark CJ, Cooper Z, Mitchell SL, Kim DH, Hsu J, Sepucha K, Chunga RE, Lipsitz SR, Weissman JS, Schoenfeld AJ. JAMA Netw. Open 2024; 7(5): e2413878.

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**Abstract**

**IMPORTANCE:** The decision for surgical vs nonsurgical treatment for hip fracture can be complicated among community-dwelling people living with dementia.

**OBJECTIVE:** To compare outcomes of community-dwelling people living with dementia treated surgically and nonsurgically for hip fracture. **DESIGN, SETTING, AND**

**PARTICIPANTS:** This retrospective cross-sectional study undertook a population-based analysis of national Medicare fee-for-service data. Participants included community-dwelling Medicare beneficiaries with dementia and an inpatient claim for hip fracture from January 1, 2017, to June 30, 2018. Analyses were conducted from November 10, 2022, to October 17, 2023. **EXPOSURE:** Surgical vs nonsurgical treatment for hip fracture. **MAIN OUTCOMES AND MEASURES:** The primary outcome was mortality within 30, 90, and 180 days. Secondary outcomes consisted of selected post-acute care services.

**RESULTS:** Of 56 209 patients identified with hip fracture (73.0% women; mean [SD] age, 86.4 [7.0] years), 33 142 (59.0%) were treated surgically and 23 067 (41.0%) were treated nonsurgically. Among patients treated surgically, 73.3% had a fracture of the femoral head and neck and 40.2% had moderate to severe dementia (MSD). Among patients with MSD and femoral head and neck fracture, 180-day mortality was 31.8% (surgical treatment) vs 45.7% (nonsurgical treatment). For patients with MSD treated surgically vs nonsurgically, the unadjusted odds ratio (OR) of 180-day mortality was 0.56 (95% CI, 0.49-0.62;  $P < .001$ ) and the adjusted OR was 0.59 (95% CI, 0.53-0.66;  $P < .001$ ). Among patients with mild dementia and femoral head and neck fracture, 180-day mortality was 26.5% (surgical treatment) vs 34.9% (nonsurgical treatment). For patients with mild dementia who were treated surgically vs nonsurgically for femoral head and neck fracture, the unadjusted OR of 180-day mortality was 0.67 (95% CI, 0.60-0.76;  $P < .001$ ) and the adjusted OR was 0.71 (95% CI, 0.63-0.79;  $P < .001$ ). For patients with femoral head and neck fracture, there was no difference in admission to a nursing home within 180 days when treated surgically vs nonsurgically.

**CONCLUSIONS AND RELEVANCE:** In this cohort study of community-dwelling patients with dementia and fracture of the femoral head and neck, patients with MSD and mild dementia treated surgically experienced lower odds of death compared with patients treated nonsurgically. Although avoiding nursing home admission is important to persons living with dementia, being treated surgically

for hip fracture did not necessarily confer a benefit in that regard. These data can help inform discussions around values and goals with patients and caregivers when determining the optimal treatment approach.

**Language:** en

**Keywords:** Humans; Cross-Sectional Studies; Aged; Female; Male; United States/epidemiology; Retrospective Studies; Aged, 80 and over; Treatment Outcome; \*Dementia/therapy/mortality; \*Hip Fractures/mortality/surgery/therapy; \*Independent Living/statistics & numerical data; \*Medicare/statistics & numerical data

## **Multiple long-term conditions and disability are independently associated with higher risk of fall among community adults: a cross-sectional study**

Alenazi AM, Alhwoaimel NA, Alqahtani BA, Alshehri MM, Alhowimel AS, Khunti K, Alghamdi MS. Risk Manag. Healthc. Policy 2024; 17: 1407-1416.

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### **Abstract**

**BACKGROUND:** Previous studies have suggested an association between falls and the presence of Multiple Long-Term Conditions (MLTC) or disabilities. However, there is limited understanding of how these factors independently or collectively contribute to the risk of falls and fear of falling among community-dwelling adults.

**OBJECTIVE:** This study examined the independent association between MLTC and the presence of disability with the risk of falls among community adults.

**METHODS:** A cross-sectional study included 324 adults (age  $\geq 50$ ). Demographic and clinical data included age, sex, body mass index (BMI), MLTC ( $\geq$  two chronic diseases) risk of fall (ie, history of fall in the previous 12-months, number of falls, and recurrent falls). The Barthel Index and Falls Efficacy Scale-International (FES-I) were used to assess disability and fear of fall, respectively.

**RESULTS:** MLTC (Odds Ratio (OR) 2.50, 95% Confidence Interval (CI) [1.26, 4.95],  $p=0.009$ ), and disability (OR 1.71, 95% CI [1.04, 2.79],  $p = 0.034$ ) were independently associated with history of falls. MLTC (Incidence Rate Ratio (IRR) 2.87, 95% CI [1.93, 4.29],  $p < 0.001$ ) and disability (IRR 1.86 95% CI [1.46, 2.36],  $p < 0.001$ ) were independently associated with an increased number of falls. MLTC (OR 4.50, 95% CI [1.78, 11.36],  $p = 0.001$ ) and disability (OR 2.82, 95% CI [1.58, 5.05],  $p < 0.001$ ) were independently associated with recurrent falls. MLTC ( $B = 6.45$ ,  $p < 0.001$ ) and disability ( $B = 3.05$ ,  $p = 0.025$ ) were independently associated with increased fear of falling.

**CONCLUSION:** This study indicated that both MLTC and disability are independently associated with falls, number of falls and fear of falling in this population.

**Language:** en

**Keywords:** falling; Saudi; multimorbidity; disabilities; functional limitations; impairments; multiple chronic diseases

## Unintentional injuries and falls in populations in Russia: the Ural Eye and Medical Study and the Ural Very Old Study

Bikbov MM, Kazakbaeva GM, Gilmanshin TR, Zainullin RM, Iakupova EM, Panda-Jonas S, Fakhretdinova AA, Tuliakova AM, Gilemzianova LI, Khakimov DA, Miniازهva LA, Jonas JB. *Heliyon* 2024; 10(10): e31348.

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### Abstract

**BACKGROUND:** To explore the prevalence of self-reported unintentional injuries and falls (UIFs) in medium-aged and old populations in Russia and factors associated with them.

**METHODS:** Two population-based studies (Ural Eye and Medical Study (UEMS), Ural Very Old Study (UVOS)) were carried out in urban and rural areas in Bashkortostan/Russia. They consisted of 5899 individuals (age: 40+ years) and 1526 participants (age: 85+ years), respectively. We assessed previous falls as part of an interview with standardized questions, conducted in the framework of a series of medical and ophthalmological assessments.

**RESULTS:** In the UEMS with 5894 individuals (age:  $59.0 \pm 10.7$  years), UIF prevalence was 1101/5894 (18.7 %; 95 % confidence interval (CI) 17.7, 19.7), with 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10+ UIFs reported by 766 (69.6 %), 146 (13.3 %), 56 (1.4 %), 15 (1.4 %), 19 (1.7 %), 3 (0.3 %), 2 (0.2 %), 1 (0.01 %), and 10 (0.9 %) participants, respectively. The UIFs had occurred as outdoor incidents ( $n = 594$ ; 53.8 %), at home ( $n = 162$ ; 14.7 %), on the road or traffic accidents ( $n = 109$ ; 9.9 %), at work ( $n = 77$ ; 7.0 %), during garden work ( $n = 24$ ; 2.2 %) or as falls from a higher level ( $n = 17$ ; 1.5 %) or from house roofs ( $n = 16$ ; 1.4 %). In 100 (1.7 % of the total study population; 9.1 % of the group with UIFs) participants, low vision was reported as a major cause for the UIF. Higher UIF prevalence was associated (multivariable analysis) with older age (odds ratio (OR): 1.01; 95%CI: 1.005, 1.02;  $P < 0.001$ ), urban region of habitation (OR: 1.59; 95%CI: 1.37, 1.85;  $P = 0.001$ ), higher smoking package number (OR: 1.01; 95%CI: 1.004, 1.01;  $P = 0.001$ ), longer waist circumference (OR: 1.01; 95%CI: 1.002, 1.01;  $P = 0.008$ ), higher prevalence of a history of arthritis (OR: 1.38; 95%CI: 1.18, 1.62;  $P < 0.001$ ) and backache (OR: 1.73; 95%CI: 1.49, 2.02;  $P < 0.001$ ), and higher depression score (OR: 1.05; 95%CI: 1.03, 1.07;  $P < 0.001$ ). Out of 1525 UVOS participants (age:  $88.8 \pm 2.9$  years; range: 85-103.1 years), the UIF prevalence was 780/1525 (51.1 %; 95%CI: 48.6, 53.6), with 390 (50.0 %), 116 (14.8 %), 49 (6.3 %), 12 (1.5 %), 8 (1.0 %), 2 (0.3 %), 4 (0.5 %), 1 (0.1 %), and 15 (1.9 %) participants reported about 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10+ UIFs, respectively. The UIFs had occurred as outdoor incidents ( $n = 386$ ; 25.3 %), at home ( $n = 214$ ; 14.0 %), on the road or traffic accidents ( $n = 22$ ; 1.4 %), at work ( $n = 21$ ; 1.4 %), during garden work ( $n = 10$ ; 0.7 %) or as falls from a higher level ( $n = 11$ ; 0.7 %) or from house roofs ( $n = 1$ ; 0.1 %). A higher UIF prevalence correlated with female sex (OR: 1.65; 95%CI: 1.30, 2.09;  $P < 0.001$ ) and Russian ethnicity (OR: 1.26; 95%CI: 1.02, 1.56;  $P = 0.03$ ).

**CONCLUSIONS:** UIFs have occurred to a substantial part of the adult and very old population in Russia.

**Language:** en

**Keywords:** Anxiety; Depression; Falls; Russia; Population-based study; Unintentional injuries; Hearing impairment; Ural eye and medical study; Ural very old study; Vision impairment

## **Integrating attention mechanism and multi-scale feature extraction for fall detection**

Chen H, Gu W, Zhang Q, Li X, Jiang X. Heliyon 2024; 10(10): e31614.

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### **Abstract**

Addressing the critical need for accurate fall event detection due to their potentially severe impacts, this paper introduces the Spatial Channel and Pooling Enhanced You Only Look Once version 5 small (SCPE-YOLOv5s) model. Fall events pose a challenge for detection due to their varying scales and subtle pose features. To address this problem, SCPE-YOLOv5s introduces spatial attention to the Efficient Channel Attention (ECA) network, which significantly enhances the model's ability to extract features from spatial pose distribution. Moreover, the model integrates average pooling layers into the Spatial Pyramid Pooling (SPP) network to support the multi-scale extraction of fall poses. Meanwhile, by incorporating the ECA network into SPP, the model effectively combines global and local features to further enhance the feature extraction. This paper validates the SCPE-YOLOv5s on a public dataset, demonstrating that it achieves a mean Average Precision of 88.29 %, outperforming the You Only Look Once version 5 small by 4.87 %. Additionally, the model achieves 57.4 frames per second. Therefore, SCPE-YOLOv5s provides a novel solution for fall event detection.

**Language:** en

**Keywords:** Efficient channel attention; Fall events; Spatial attention; Spatial pyramid pooling

## **Interventions to prevent falls in older adults: updated evidence report and systematic review for the US Preventive Services Task Force**

Guirguis-Blake JM, Perdue LA, Coppola EL, Bean SI. *J. Am. Med. Assoc. JAMA* 2024; ePub(ePub): ePub.

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**PMID:** 38833257

### **Abstract**

**IMPORTANCE:** Falls are the most common cause of injury-related morbidity and mortality in older adults.

**OBJECTIVE:** To systematically review evidence on the effectiveness and harms of fall prevention interventions in community-dwelling older adults. **DATA SOURCES:** MEDLINE, Cumulative Index for Nursing and Allied Health Literature, and Cochrane Central Register of Controlled Clinical Trials for relevant English-language literature published between January 1, 2016, and May 8, 2023, with ongoing surveillance through March 22, 2024. **STUDY SELECTION:** Randomized clinical trials of interventions to prevent falls in community-dwelling adults 65 years or older. **DATA EXTRACTION AND SYNTHESIS:** Critical appraisal and data abstraction by 2 independent reviewers. Random-effects meta-analyses with Knapp-Hartung adjustment. **MAIN OUTCOMES AND MEASURES:** Falls, injurious falls, fall-related fractures, hospitalizations or emergency department visits, people with 1 or more falls, people with injurious falls, people with fall-related fractures, and harms.

**RESULTS:** Eighty-three fair- to good-quality randomized clinical trials (n = 48 839) examined the effectiveness of 6 fall prevention interventions in older adults. This article focuses on the 2 most studied intervention types: multifactorial (28 studies; n = 27 784) and exercise (37 studies; n = 16 117) interventions. Multifactorial interventions were associated with a statistically significant reduction in falls (incidence rate ratio [IRR], 0.84 [95% CI, 0.74-0.95]) but not a statistically significant reduction in individual risk of 1 or more falls (relative risk [RR], 0.96 [95% CI, 0.91-1.02]), injurious falls (IRR, 0.92 [95% CI, 0.84-1.01]), fall-related fractures (IRR, 1.01 [95% CI, 0.81-1.26]), individual risk of injurious falls (RR, 0.92 [95% CI, 0.83-1.02]), or individual risk of fall-related fractures (RR, 0.86 [95% CI, 0.60-1.24]). Exercise interventions were associated with statistically significant reductions in falls (IRR, 0.85 [95% CI, 0.75-0.96]), individual risk of 1 or more falls (RR, 0.92 [95% CI, 0.87-0.98]), and injurious falls (IRR, 0.84 [95% CI, 0.74-0.95]) but not individual risk of injurious falls (RR, 0.90 [95% CI, 0.79-1.02]). Harms associated with multifactorial and exercise interventions were not well reported and were generally rare, minor musculoskeletal symptoms associated with exercise.

**CONCLUSIONS AND RELEVANCE:** Multifactorial and exercise interventions were associated with reduced falls in multiple good-quality trials. Exercise demonstrated the most consistent statistically significant benefit across multiple fall-related outcomes.

**Language:** en

## **Understanding the delivery of the Falls Management Exercise Programme (FaME) across the U.K**

Hawley-Hague H, Ventre J, Quigley C, Skelton DA, Todd C. J. Frailty Sarcopenia Falls 2024; 9(2): 96-121.

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**PMCID:** PMC11145094

### **Abstract**

**OBJECTIVES:** 1) Map FaME delivery across the UK, 2) explore and understand delivery of the FaME programme in practice.

**METHODS:** Sequential exploratory mixed methods. 1) survey of n=247 Postural Stability Instructor (PSIs) across the UK, 2) purposively sampled n=23 PSIs to take part in interviews. Quantitative data was described descriptively due to low sample size, and qualitative data coded using thematic analysis.

**RESULTS:** Instructors pre-dominantly delivered classes in a community-setting, were mostly White British females with a range of experience. Most respondents were exercise instructors, physiotherapists, or therapist assistants. Only 136 (55.1%) respondents currently delivered the programme. The essential components of the FaME programme that instructors did not implement routinely were backward chaining, floorwork and Tai Chi. Five main themes emerged from qualitative data: individual, delivery and set-up, evidence-based delivery, motivational strategies, and instructor-based factors. Most instructors reported fidelity to most components of FaME and shared barriers and facilitators to delivering classes.

**CONCLUSION:** This study gives a UK overview of the implementation of FaME. PSIs present a complex picture of the ways set-up and delivery of evidence-based programmes in practice can influence older adults' attendance, adherence and experience of the programme, and barriers and facilitators to delivery of the programme with fidelity.

**Language:** en

**Keywords:** Intervention; Falls; Implementation; Older adults; Exercise

## **Prevalence and factors associated with frailty among community-dwelling middle-aged and older adults in Malaysia**

Hidzir H, Hairi NN, Kamaruzzaman SB, Awang H. *Asia Pac. J. Public Health* 2024; ePub(ePub): ePub.

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### **Abstract**

Frailty is identified in middle-aged and older adults, and frail individuals are vulnerable to dependency and poor health. In this study, we analyzed nationally representative data that includes 5592 participants aged 40 years and above to determine the prevalence and factors associated with frailty among community-dwelling middle-aged and older adults in Malaysia. Using a 40-item Frailty Index, the overall prevalence of frailty and prefrailty was 19.5% and 64.1%, respectively. A total of 38.6% of older adults ( $\geq 60$  years) were frail and 56.2% were prefrail. Among middle-aged adults ( $< 60$  years), the prevalence of frailty was 10.4% and that of prefrailty was 67.9%. Factors associated with frailty include older age, ethnicity, low education and income level, moderate to poor self-rated health, abdominal obesity, absence of a spouse, and previous history of falls. These findings may serve as evidence for the implementation of a frailty policy and health care planning in Malaysia.

**Language:** en

**Keywords:** Malaysia; prevalence; older adults; frailty; associate factors; middle-age

# **An emergency medical technician administered falls-assessment protocol to safely identify elderly adults with non-urgent conditions that may avoid transport to emergency department**

Hutchinson P, Nadeau A, Mercier E, Bouchard J, Beaulieu S, Brousseau AA, Breton. *Can. Geriatr. J.* 2024; 27(2): 159-167.

(Copyright © 2024, Canadian Geriatrics Society)

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**PMCID:** PMC11100985

## **Abstract**

**BACKGROUND:** Approximately two-thirds of patients transported to emergency departments (ED) for a fall are discharged from the ED without urgent treatment. This pilot study tests the feasibility of implementing a pre-hospital falls-assessment protocol performed by emergency medical technicians (EMTs) to determine whether a patient who fell needs an ED assessment or could be referred safely to a community resource.

**METHODS:** The protocol was administered by trained EMTs to adults aged  $\geq 65$  after a fall between October 2019 and March 2020 in Sherbrooke (QC). All patients were transported to ED regardless of protocol outcome (transport recommended/not recommended). The objective was to assess if EMTs could complete the protocol and make the appropriate decision concerning the transport to ED. Secondary objectives aimed to assess the accuracy in identifying patients who do not require transport, and to measure the impact on avoidable ambulance transports.

**RESULTS:** A total of 125 EMTs interventions were carried out: 17 patients were in the transport not recommended group, representing 14% of transport to hospital for falls-related EMTs calls that could be possibly avoided. Of these, 110 were transported to ED. Mean duration of on-site EMTs interventions was of 31 minutes. Forty-seven patients were admitted, mostly for infections and fractures, including four in the transport not recommended group.

**CONCLUSIONS:** This study showed that EMTs can administer a falls-assessment protocol aimed at identifying patients that need an ED evaluation.

**RESULTS** permitted to amend the protocol before the second phase of the project evaluating the safety of the protocol.

**Language:** en

**Keywords:** prehospital; seniors; falls; redirection

## **Acceptability, feasibility, and effectiveness of WE-SURF™: a virtual supervised group-based fall prevention exercise program among older adults**

Ing JBM, Tan MP, Whitney J, Tiong IK, Singh DKA. *Aging Clin. Exp. Res.* 2024; 36(1): e125.

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### **Abstract**

Conducted physically, supervised group-based falls prevention exercise programs have demonstrated effectiveness in reducing the risk of falls among older adults. In this study, we aimed to assess the acceptability, feasibility, and effectiveness of a virtual supervised group-based falls prevention exercise program (WE-SURF™) for community-dwelling older adults at risk of falls.

**METHOD:** A preliminary study utilizing virtual discussions was conducted to assess the acceptability of the program among six older adults. Effectiveness was evaluated in a randomized controlled feasibility study design, comprising 52 participants (mean age: 66.54; SD: 5.16), divided into experimental (n = 26) and control (n = 26) groups. The experimental group engaged in a 6-month WE-SURF™ program, while the control group received standard care along with a fall's prevention education session. Feasibility of the intervention was measured using attendance records, engagement rates from recorded videos, dropouts, attrition reasons, and adverse events.

**RESULTS:** Preliminary findings suggested that WE-SURF™ was acceptable, with further refinements. The study revealed significant intervention effects on timed up and go (TUG) ( $\eta^2p:0.08$ ;  $p < 0.05$ ), single leg stance (SLS) ( $\eta^2p:0.10$ ;  $p < 0.05$ ), and lower limb muscle strength ( $\eta^2p:0.09$ ;  $p < 0.05$ ) tests. No adverse events occurred during the program sessions, and both attendance and engagement rates were high (> 80% and 8/10, respectively) with minimal dropouts (4%). The WE-SURF™ program demonstrated effectiveness in reducing the risk of falls while enhancing muscle strength and balance.

**CONCLUSION:** In conclusion, WE-SURF™ was demonstrated to be an acceptable, feasible, and effective virtual supervised group-based exercise program for fall prevention in community-dwelling older adults at risk of falls. With positive outcomes and favourable participant engagement, WE-SURF™ holds the potential for wider implementation. Further research and scaling-up efforts are recommended to explore its broader applicability. (Registration number: ACTRN 12621001620819).

**Language:** en

**Keywords:** Humans; Aged; Female; Male; Middle Aged; Older adults; Independent Living; \*Accidental Falls/prevention & control; \*Exercise Therapy/methods; \*Feasibility Studies; Fall prevention; Postural Balance/physiology; Virtual group-based exercise

## **Prevention of falls in older adults**

Jin J. J. Am. Med. Assoc. JAMA 2024; ePub(ePub): ePub.

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### **Abstract**

Falls are the leading cause of injury in adults aged 65 years or older.

Falls are common among older adults. In a 2018 survey, more than one-fourth of US older adults living in the community reported at least 1 fall in the past year. A serious fall in an older adult can result in injury (such as hip fracture) that causes decreased independence and decreased quality of life. The risk of falling increases with age for many reasons, including overall weakness and frailty; problems with balance, cognition, and vision; certain medications; acute illness; and other environmental hazards. Those who have fallen in the past are at high risk of falling again.

**Language:** en

# Effects of community-based fall prevention interventions for older adults using information and communication technology: a systematic review and meta-analysis

Lee K, Yi J, Lee SH. Health Informatics J. 2024; 30(2): e14604582241259324.

(Copyright © 2024, SAGE Publishing)

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## Abstract

**OBJECTIVES:** This systematic review and meta-analysis aimed to investigate the effect of fall prevention interventions using information and communication technology (ICT).

**METHODS:** A comprehensive search across four databases was performed. The inclusion criteria were fall prevention interventions including telehealth, computerized balance training, exergaming, mobile application education, virtual reality exercise, and cognitive-behavioral training for community-dwelling adults aged  $\geq 60$  years.

**RESULTS:** Thirty-four studies were selected. Telehealth, smart home systems, and exergames reduced the risk of falls (RR = 0.63, 95% CI [0.54, 0.75]). Telehealth and exergame improved balance (MD = 3.30, 95% CI [1.91, 4.68]; MD = 4.40, 95% CI [3.09, 5.71]). Telehealth improved physical function (SMD = 0.69, 95% CI [0.23, 1.16]). Overall, ICT fall interventions improved fall efficacy but not cognitive function. For quality of life (QOL), mixed results were found depending on the assessment tools.

**CONCLUSION:** Future investigations on telehealth, smart home systems, or exergames are needed to motivate older adults to exercise and prevent falls.

**Language:** en

**Keywords:** Humans; Aged; accidental falls; older adults; telehealth; information and communication technology; Independent Living; Information Technology; Quality of Life/psychology; \*Accidental Falls/prevention & control; \*Telemedicine; fall prevention

## **Study on the prevention of fall risk in elderly stroke patients based on an intelligent model of rehabilitation care**

Li X, Liu M, Wang C. *Altern. Ther. Health Med.* 2024; ePub(ePub): ePub.

(Copyright © 2024, InnoVision Communications)

**DOI:** unavailable

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### **Abstract**

**BACKGROUND:** Fall is a public health problem that cannot be ignored by elderly stroke patients, and rehabilitation care plays an important role in the rehabilitation process of elderly stroke patients.

**OBJECTIVE:** To investigate the prevention effect of fall risk in elderly stroke patients under the intelligent model of rehabilitation care.

**METHODS:** The general data of elderly patients who were diagnosed as stroke and admitted to our hospital between June 2021 and June 2022 were retrospectively analyzed, with exclusion like unclear clinical data or combined with other severe organ insufficiency. A total of 150 of them were selected for the study, and the patients were divided into a fall group and a non-fall group according to whether they had a fall or not. The factors associated with falls in stroke patients were analyzed univariately, and the rehabilitation care intelligence model of the predictive model of falls in stroke patients was established using multiple covariance ridge regression analysis to observe the predictive value of patients' risk of falling in the rehabilitation care intelligence model.

**RESULTS:** Results of multiple covariance ridge regression analysis to build the model showed age ( $P < .001$ ), low MNA-SF score ( $P < .001$ ), hypertension ( $P = .035$ ), anaemia ( $P = .048$ ), gout ( $P < .001$ ), assistive devices ( $P = .002$ ), visual impairment ( $P = .033$ ), elevated ALB ( $P < .001$ ), and elevated HGB ( $P < .001$ ) as risk factors for falls in stroke patients. The diagnostic threshold for screening elderly stroke patients for falls based on risk factors was 0.272, with a sensitivity of 90.7%, specificity of 98.1% and an area under the ROC curve of 0.976 ( $P < .05$ ), which was superior to other single indicators in terms of diagnostic value. The calibration of the prediction model, based on the Hosmer and Lemeshow test of goodness of fit, showed  $P = 1.14$ , indicating a high calibration of the prediction model.

**CONCLUSION:** There are many risk factors for falls in stroke elderly patients, such as low MNA-SF score, gout, elevated ALB, and elevated HGB. Building a rehabilitation nursing intelligent model based on the above inducement factors can reduce the risk of patients falling to a certain extent, and the prediction model has a high degree of calibration. Therefore, a simple and standardized intelligent rehabilitation nursing model for stroke patients in the early stage can effectively prevent the occurrence of falls.

**Language:** en

# **Planovalgus foot deformity in patients undergoing total hip arthroplasty is associated with increased risk of falls, implant-related complications, and revisions: a case-control analysis**

Mekkawy KL, Saha P, Rodriguez HC, Stafford JA, Roche MW, Corces A, Gosthe RG. J. Arthroplasty 2024; ePub(ePub): ePub.

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## **Abstract**

**INTRODUCTION:** Pes planus, also known as flat foot, occurs due to the loss of the longitudinal arch of the foot. Pes planus leads to overpronation of the foot and altered gait mechanics. This may lead to an increased risk of complications following total hip arthroplasty (THA). Thus, the aim of this study was to assess the effects that pes planus has on rates of falls, implant complications, fall-related injuries, and times to revision among THA patients.

**METHODS:** A retrospective review of a private insurance claims database was conducted from 2010 to 2021. Patients who had a diagnosis of congenital or acquired pes planus and cases of THA were identified. Patients undergoing THA with a prior diagnosis of pes planus were matched to control patients 1:5 based on age, sex, and comorbidity profiles. Logistic regression was utilized to assess for differences in complication rates.

**RESULTS:** A total of 3,622 pes planus patients were matched to 18,094 control patients. The pes planus group had significantly higher rates of falls than the control group (6.93 versus 2.97%, OR [odds ratio]: 2.43; CI [confidence interval]: 2.09 to 2.84;  $P < 0.001$ ). Pes planus patients also had significantly greater odds of dislocation (OR: 1.89; CI: 1.58 to 2.27;  $P < 0.001$ ), mechanical loosening (OR: 2.43; CI: 2.09 to 2.84;  $P = 0.019$ ), and periprosthetic fracture (OR: 2.43; CI: 2.09 to 2.84;  $P < 0.001$ ) when compared to the control group. The pes planus group had significantly greater rates of proximal humerus fractures ( $P = 0.008$ ), but no difference was seen in distal radius fractures ( $P = 0.102$ ). The time to revision was significantly shorter in the pes planus group (190 versus 554 days,  $P < 0.001$ ).

**CONCLUSIONS:** Pes planus in patients undergoing THA is associated with significantly increased fall risk, odds of implant complications, and a faster time to revision. The findings of this study may allow orthopaedic surgeons to be more attentive to identifying those patients at risk and allow for more educated patient counseling and operative planning.

**Language:** en

**Keywords:** outcomes; complications; pes planus; total hip arthroplasty

## **Balance measures for fall risk screening in community-dwelling older adults with COPD: a longitudinal analysis**

Nguyen KT, Brooks D, Macedo LG, Ellerton C, Goldstein R, Alison JA, Dechman G, Harrison SL, Holland AE, Lee AL, Marques A, Spencer L, Stickland MK, Skinner EH, Haines KJ, Beauchamp MK. *Respir. Med.* 2024; ePub(ePub): ePub.

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**PMID:** 38821219

### **Abstract**

**BACKGROUND:** Chronic obstructive pulmonary disease (COPD) increases fall risk, but consensus is lacking on suitable balance measures for fall risk screening in this group. We aimed to evaluate the reliability and validity of balance measures for fall risk screening in community-dwelling older adults with COPD.

**METHODS:** In a secondary analysis of two studies, participants, aged  $\geq 60$  with COPD and 12-month fall history or balance issues were tracked for 12-month prospective falls. Baseline balance measures - Brief Balance Evaluation Systems Test (Brief BESTest), single leg stance (SLS), Timed Up and Go (TUG), and TUG Dual-Task (TUG-DT) test - were assessed using intra-class correlation (ICC(2,1)) for reliability, Pearson/Spearman correlation with balance-related factors for convergent validity, t-tests/Wilcoxon rank-sum tests with fall-related and disease-related factors for known-groups validity, and area under the receiver operator characteristic curve (AUC) for predictive validity.

**RESULTS:** Among 174 participants ( $73 \pm 8$  years; 86 females) with COPD, all balance measures showed excellent inter-rater and test-retest reliability (ICC(2,1)=0.88-0.97) and moderate convergent validity ( $r=0.34-0.77$ ) with related measures. Brief BESTest and SLS test had acceptable known-groups validity ( $p < 0.05$ ) for 12-month fall history, self-reported balance problems, and gait aid use. TUG test and TUG-DT test discriminated between groups based on COPD severity, supplemental oxygen use, and gait aid use. All measures displayed insufficient predictive validity (AUC  $< 0.70$ ) for 12-month prospective falls.

**CONCLUSION:** Though all four balance measures demonstrated excellent reliability, they lack accuracy in prospectively predicting falls in community-dwelling older adults with COPD. These measures are best utilized within multi-factorial fall risk assessments for this population.

**Language:** en

**Keywords:** Falls; Balance; COPD; Mobility; Prospective Study

## **Interventions to prevent falls in community-dwelling older adults: US preventive services task force recommendation statement**

Nicholson WK, Silverstein M, Wong JB, Barry MJ, Chelmow D, Coker TR, Davis EM, Jaén CR, Krousel-Wood M, Lee S, Li L, Rao G, Ruiz JM, Stevermer J, Tsevat J, Underwood SM, Wiehe S. *J. Am. Med. Assoc. JAMA* 2024; ePub(ePub): ePub.

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**PMID:** 38833246

### **Abstract**

**IMPORTANCE:** Falls are the leading cause of injury-related morbidity and mortality among older adults in the US. In 2018, 27.5% of community-dwelling adults 65 years or older reported at least 1 fall in the past year and 10.2% reported a fall-related injury. In 2021, an estimated 38 742 deaths resulted from fall-related injuries.

**OBJECTIVE:** The US Preventive Services Task Force (USPSTF) commissioned a systematic review to evaluate the effectiveness and harms of primary care-relevant interventions to prevent falls and fall-related morbidity and mortality in community-dwelling adults 65 years or older. **POPULATION:** Community-dwelling adults 65 years or older at increased risk of falls. **EVIDENCE ASSESSMENT:** The USPSTF concludes with moderate certainty that exercise interventions provide a moderate net benefit in preventing falls and fall-related morbidity in older adults at increased risk for falls. The USPSTF concludes with moderate certainty that multifactorial interventions provide a small net benefit in preventing falls and fall-related morbidity in older adults at increased risk for falls. **RECOMMENDATION:** The USPSTF recommends exercise interventions to prevent falls in community-dwelling adults 65 years or older who are at increased risk for falls. (B recommendation) The USPSTF recommends that clinicians individualize the decision to offer multifactorial interventions to prevent falls to community-dwelling adults 65 years or older who are at increased risk for falls. Existing evidence indicates that the overall net benefit of routinely offering multifactorial interventions to prevent falls is small. When determining whether this service is appropriate for an individual, patients and clinicians should consider the balance of benefits and harms based on the circumstances of prior falls, presence of comorbid medical conditions, and the patient's values and preferences. (C recommendation).

**Language:** en

## Preventing falls in older persons: steps in the right direction

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### Abstract

Among older persons, falls are common (about 25% of older US adults fall each year), injurious (approximately 37% of those who fall require medical treatment or restrict their activity for at least 1 day), expensive (approximately \$50 billion per year is spent on medical costs related to falls), and are a worsening problem. In fact, age-adjusted rates of fatal falls increased 41% in the US from 2012 to 2021.<sup>1</sup> Moreover, because the incidence of falls rises with increasing age, the absolute number of older adults who fall will increase dramatically as the next generation enters the highest-risk age groups.

In response to the burden of falls, substantial research efforts have been undertaken. The US Preventive Services Task Force (USPSTF) updated Evidence Report and Systematic Review published in this issue of JAMA<sup>2</sup> identified 83 fair- to good-quality randomized clinical trials to inform the USPSTF updated Recommendation Statement,<sup>3</sup> 32 of which were new since the previous review. These trials support exercise for fall prevention (incidence rate ratio [IRR], 0.85 [95% CI, 0.75-0.96] for falls and IRR, 0.84 [95% CI, 0.74-0.95] for injurious falls). The evidence for multifactorial interventions demonstrated similar reductions in falls (IRR, 0.84 [95% CI, 0.74-0.95]) but not injurious falls (IRR, 0.92 [95% CI, 0.84-1.01]).

On this basis, the USPSTF reiterated its 2018 recommendations for fall prevention with a B recommendation for exercise (recommended for all over 65 years of age at increased risk of falls) and a C recommendation for multifactorial interventions (individualized decision based on the circumstances of patient's prior falls, comorbid medical conditions, and values and preferences).<sup>3</sup> Although the USPSTF recommendations are sound, the devil is in the details.

**Language:** en

# **Falls prevention is more than just promoting physical health: evaluation of the group-based, out-patient prevention program 'Staying safe and active in old age - falls prevention'**

Steckhan GM, Warner LM, Fleig L. Health Psychol. Behav. Med. 2024; 12(1): e2358915.

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## **Abstract**

**INTRODUCTION:** The aim of this study was to evaluate the German falls prevention program 'Staying safe and active in old age - falls prevention', which is already established in practice.

**METHODS:** The single-arm intervention study consisted of two time points, 6 months apart, to evaluate the multifactorial falls prevention program (n = 125 at Time 2). We observed the groups and their trainers and assessed which behavior change techniques (BCTs) were used. According to our evaluation framework, changes in the following three domains were assessed: (a) fall-related variables (i.e. number of falls, fear of falling), (b) physical functioning (i.e. performance-based gait speed, coordination, self-reported leg strength, balance, as well as habitual execution of the exercises), and (c) psychosocial functioning (i.e. quality of life, activities of daily living, mobility, and loneliness). Linear mixed models were used to determine changes in each variable.

**RESULTS:** Demonstration of behavior was the most frequently used BCT. The program showed significant benefits for fear of falling, balance, coordination, habitual execution, and loneliness over time (Cohen's d between -0.59 and 1.73). Number of falls, gait speed, coordination (dual task), activities of daily living, and quality of life were maintained (Cohen's d between -0.26 and 0.30), whereas leg strength and mobility decreased significantly at Time 2 (Cohen's d = -0.55 and -0.36).

**DISCUSSION:** Group-based falls prevention programs may facilitate social integration among older adults and may also enhance and maintain physical functioning in old age. Trial registration: German Clinical Trials Register identifier: DRKS00012321.

**Language:** en

**Keywords:** loneliness; coordination; balance; Fear of falling; habitual execution

## **Functional clinical motor performance tests to assess potential fall risks in patients with haemophilia: a case-control study**

Tomschi F, Brühl M, Schmidt A, Ransmann P, Strauss AC, Hilberg T. Haemophilia 2024; ePub(ePub): ePub.

(Copyright © 2024, John Wiley and Sons)

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**PMID:** 38837595

### **Abstract**

**INTRODUCTION:** Patients with haemophilia (PwH) are at increased risk of falls due to haemophilic arthropathy. Yet, studies on clinical tests associated with the risk of falling are scarce in PwH. **AIMS:** (1) To evaluate the feasibility of different clinical motor performance tests associated with the risk of falling in PwH; (2) to evaluate PwH's performance of these tests compared to a control group; (3) to identify possible influencing factors that affect performance.

**METHODS:** Twenty-nine severe and moderate PwH (57.0 years, IQR: 48.0-61.5) and 29 healthy age- and BMI-matched control participants (CG) performed 13 different clinical tests (SPPB, timed up and go, push and release, functional reach, single-leg stance, knee and grip strength). Haemophilia joint health score (HJHS), kinesiophobia (TSK-11), subjective physical performance (HEP-Test-Q), falls efficiency (FES-I) and falls were assessed.

**RESULTS:** No adverse events occurred. PwH showed impaired performance in all clinical tests, a lower falls efficiency and a higher HJHS than CG. PwH with higher HJHS, lower HEP-Test-Q and higher TSK-11 scores showed higher deficits. Largest discrepancies were observed in the single-leg stance with eyes open and knee extensor strength, where orthopaedically majorly affected PwH showed worse performance compared to minorly affected PwH and the CG, respectively. The prevalence of  $\geq 1$  fall in the last year was 27.6% (PwH) and 10.3% (CG).

**CONCLUSION:** These clinical tests are feasible in PwH. Impaired joint status, a high kinesiophobia and low physical performance impair performance. These tests can be used by clinicians for gaining specific information on functional motor abilities of patients.

**Language:** en

**Keywords:** strength; rare disease; balance; haemophilic arthropathy; proprioception; risk of falling

## **The feasibility of the Motor Control Home Ergonomics Elderlies' Prevention of Falls (McHeELP) Programme in patients with sarcopenia: a pilot study**

Tsekoura M, Matzaroglou C, Xergia S, Dionyssiotis Y, Tsepis E, Sakellari V, Billis E. J. Frailty Sarcopenia Falls 2024; 9(2): 89-95.

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PMCID: PMC11145092

### **Abstract**

**OBJECTIVES:** The objective of this pilot study was to investigate the feasibility of a three month 'Motor control Home ergonomics Elderlies' Prevention of falls' (McHeELP) programme on muscle mass, muscle strength, functionality, balance and fear of falling among older adults with sarcopenia.

**METHODS:** A feasibility study of the McHeELP programme was performed in patients with sarcopenia. Primary outcome measures included number of participants; number of participants that showed engagement with the programme; adherence rates; data loss in questionnaires and secondary outcome measures; any adverse events, related or not to the intervention programme. All participants received a home-based motor control exercise programme combined with an ergonomic home modification for 12 weeks. Secondary outcome measures included Hand Grip Strength, Bioimpedance Analysis, Muscle Mass, Functionality and Fear of Falling.

**RESULTS:** Twelve participants, (74.9±5 years), completed the pilot study. Significant differences were recorded before and after the programme on participants' functionality ( $p < 0.001$ ), balance ( $p < 0.05$ ) and fear of falling ( $p < 0.001$ ).

**CONCLUSIONS:** The present study revealed that the McHeELP programme is feasible and that it is possible to implement the programme in clinical practice. The McHeELP programme positively affects functionality, balance and fear of falling. Thus, it seems feasible to conduct a full-scale randomised controlled trial.

**Language:** en

**Keywords:** Falls; Sarcopenia; Ergonomics; Exercises; Motor control

## **Transitioning towards a virtual falls prevention program for frail seniors: learning from the experiences of older adults during the COVID-19 pandemic**

Weiss SM, Kalocsai C, Liu B, Norris M. *Can. Geriatr. J.* 2024; 27(2): 141-151.

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**PMCID:** PMC11100982

### **Abstract**

**BACKGROUND:** The literature to date is unable to clearly characterize the appropriateness of virtual care for falls prevention services from the patient perspective. In response to COVID-19, the Falls Prevention Program (FPP) at Sunnybrook Health Sciences Centre was modified to include virtual components. We set out to uncover the experiences of this unique older-adult patient population to inform FPP quality improvement and appropriate incorporation of technology post-pandemic.

**METHODS:** FPP patients during the COVID-19 pandemic (February 2020 - February 2022) and their primary caregivers met inclusion criteria. Out of 18 eligible patients, 10 consented to participate in 20-minute, semi-structured telephone interviews conducted and transcribed by the first author. Inductive coding followed by theme generation occurred through collaborative analysis.

**RESULTS:** The participants (n=10) were 60% female, mean age 84 years (SD 5.8), 60% living alone, and 70% university educated. We generated three main themes: 1) First Steps First, revealed a common desire for physical and mental support and the perceived essentials of a successful FPP highlighting the importance of program length and individualized attention; 2) Overcoming Obstacles, highlighted participants' experiences overcoming barriers with technology in the context of an isolating pandemic; and 3) Advancing Care Post-Pandemic, elaborated on the appropriateness of virtual care and delved into the importance of program personalization.

**CONCLUSION:** The interviewed older adults revealed agreement on the FPP's necessity and the importance of increasing program length, one-on-one interaction, and program flexibility for unique patient needs. Incorporating virtual assessment prior to in-person exercises was largely favoured and should be considered as an appropriate use of technology post-pandemic.

**Language:** en

**Keywords:** geriatric assessment; falls; COVID-19 pandemic; virtual care; falls prevention program; preventative care; preventative programs

## **A novel score for predicting falls in community-dwelling older people: a derivation and validation study**

Zhou M, Zhang G, Wang N, Zhao T, Liu Y, Geng Y, Zhang J, Wang N, Peng N, Huang L. BMC Geriatr. 2024; 24(1): e491.

(Copyright © 2024, Holtzbrinck Springer Nature Publishing Group - BMC)

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**PMID:** 38834944

### **Abstract**

**BACKGROUND:** Early detection of patients at risk of falling is crucial. This study was designed to develop and internally validate a novel risk score to classify patients at risk of falls.

**METHODS:** A total of 334 older people from a fall clinic in a medical center were selected. Least absolute shrinkage and selection operator (LASSO) regression was used to minimize the potential concatenation of variables measured from the same patient and the overfitting of variables. A logistic regression model for 1-year fall prediction was developed for the entire dataset using newly identified relevant variables. Model performance was evaluated using the bootstrap method, which included measures of overall predictive performance, discrimination, and calibration. To streamline the assessment process, a scoring system for predicting 1-year fall risk was created.

**RESULTS:** We developed a new model for predicting 1-year falls, which included the FRQ-Q1, FRQ-Q3, and single-leg standing time (left foot). After internal validation, the model showed good discrimination (C statistic, 0.803 [95% CI 0.749-0.857]) and overall accuracy (Brier score, 0.146). Compared to another model that used the total FRQ score instead, the new model showed better continuous net reclassification improvement (NRI) [0.468 (0.314-0.622),  $P < 0.01$ ], categorical NRI [0.507 (0.291-0.724),  $P < 0.01$ ; cutoff: 0.200-0.800], and integrated discrimination [0.205 (0.147-0.262),  $P < 0.01$ ]. The variables in the new model were subsequently incorporated into a risk score. The discriminatory ability of the scoring system was similar (C statistic, 0.809; 95% CI, 0.756-0.861; optimism-corrected C statistic, 0.808) to that of the logistic regression model at internal bootstrap validation.

**CONCLUSIONS:** This study resulted in the development and internal verification of a scoring system to classify 334 patients at risk for falls. The newly developed score demonstrated greater accuracy in predicting falls in elderly people than did the Timed Up and Go test and the 30-Second Chair Sit-Stand test. Additionally, the scale demonstrated superior clinical validity for identifying fall risk.

**Language:** en

**Keywords:** Humans; Risk Factors; Aged; Female; Male; Risk assessment; Aged, 80 and over; Older adults; Accidental falls; Predictive Value of Tests; \*Accidental Falls/prevention & control; \*Independent Living; Fall prediction; Geriatric Assessment/methods; Risk Assessment/methods