Safety Literature 24th December 2023

Development of a statistical analysis software for determining effectiveness of a comprehensive fall risk management protocol

Attanayake PM, Reither J. BMJ Open Qual. 2023; 12(4): e002450.

(Copyright © 2023, BMJ Publishing Group)

DOI: 10.1136/bmjoq-2023-002450 **PMID:** 38105241

Abstract

INTRODUCTION: As the leading cause of fatal injuries in geriatric populations, falls are a serious health concern with a predicted rate of seven fall-related deaths per hour by 2030. The Timed Up and Go (TUG) test is a screening tool proposed by the Center for Disease Control for evaluating patients' risk of falling ('fall risk'). However, there exist no current protocols on how to use the test results to decrease fall risk. The Fall Prevention Protocol (FPP) is a new comprehensive fall prevention programme created to address the lack of standardised TUG test follow-up in an Advanced Primary Care (APC) clinical setting. The programme provides a comprehensive approach for identifying fall risk and creating an individualised intervention plan to reduce the likelihood of falls. Due to the recent creation and implementation of FPP, there have been no efforts made to quantitatively prove that the FPP is more effective at reducing falls than the use of the TUG test alone without an established protocol for intervention.

METHODS: This quality improvement project focuses on creating a user-friendly statistical analysis software for determining the effectiveness of the FPP compared with just using the TUG test without a standardised post-test protocol in reducing the number of falls in geriatric patients in an APC setting. The software-created using MATLAB R2022b and finalised as a stand-alone computer application-takes in data sets of patient fall history, determines the best statistical test for comparing the data, then analyses and provides users with a conclusion regarding which protocol is more beneficial for reducing falls.

RESULTS: The developed software was proven to be user-friendly, able to be used in a healthcare setting with minimal necessary training, and deemed appropriate for data analysis of future fall risk protocol effectiveness testing.

Language: en

Keywords: Statistics; Geriatrics; Healthcare quality improvement; Performance measures; Quality improvement

Anti-fall plan for the elderly in France 2022-2024: objectives and methodology

Blain H, Annweiler C, Berrut G, Bernard PL, Bousquet J, Dargent-Molina P, Friocourt P, Puisieux F, Robiaud JB, Rolland Y. Geriatr. Psychol. Neuropsychiatr. Vieil. 2023; 21(3): 286-294.

Vernacular Title

Plan antichute des personnes âgées France 2022-2024 : objectifs et méthodologie1

(Copyright © 2023, John Libbey Eurotext)

DOI: 10.1684/pnv.2023.1122 **PMID:** 38093564

Abstract

BACKGROUND: Falls and fall-related injuries are a major public health problem in industrialized countries. Faced with this challenge, a French national plan was launched in 2022 aiming to reduce by 20% the incidence of falls-related hospitalizations or deaths.

OBJECTIVES: To describe the main pillars of the 2022-2024 French national plan against falls in older persons.

METHODS and assessment: The six pillars of the plan are: 1) screening and monitoring risks of falls and alert health and care workers; 2) home safety assessment and getting out safely; 3) developing technical aids for mobility and the use of assistive technologies at home; 4) appropriate physical activity, best weapon against falls; 5) tele-assistance devices for all older persons; 6) a cross-cutting pillar: Informing, raising awareness, training, and involving local actors. The plan, deployed in the 18 French regions, will provide a unique opportunity to determine the best strategies to achieve the objectives and the barriers encountered.

CONCLUSIONS: The deployment of the French national plan will bring useful data for considering a long-term strategy in France and helping countries or regions wishing to implement a fall prevention plan on their territory.

Language: fr

Keywords: prevention; injury; ageing; older persons; alls; clinical practice; consensus; recommendation

NSW Fall Prevention & Healthy Ageing Network

A national plan and global recommendations for the prevention of falls in the elderly

Blain H, Annweiler C, Berrut G, Bernard PL, Bousquet J, Dargent-Molina P, Friocourt P, Puisieux F, Robiaud JB, Rolland Y. Geriatr. Psychol. Neuropsychiatr. Vieil. 2023; 21(3): 284-285.

(Copyright © 2023, John Libbey Eurotext)

DOI: 10.1684/pnv.2023.1126 **PMID:** 38093563

Abstract

[The publisher has not provided an abstract for this article.]

Language: fr

NSW Fall Prevention & Healthy Ageing Network

Feasibility of implementing patient-reported and physical performance measures to identify and manage fall risk in older adults within a secondary fracture clinic

Bullock GS, Duncan P, McMurtrie E, Henry K, Graves BF, Lake AR, McDonough CM. J. Appl. Gerontol. 2023; ePub(ePub): ePub.

(Copyright © 2023, SAGE Publishing)

DOI: 10.1177/07334648231220481 **PMID:** 38113230

Abstract

The purpose of this study was to assess the feasibility of implementing both electronic and in-person assessments to assess falls risk in an older adult secondary fracture clinic. Electronic data capture feasibility was defined as the proportion of patients that completed the electronic questionnaires prior to their clinic visit. In-clinic feasibility was defined in two ways: (1) the proportion of patients that consented to participate at their clinic visit; (2) time to complete testing. Patients were contacted electronically through their health system portal for electronic consent. Patients were invited to complete consent, the STopping Elderly Accidents, Deaths, and Injuries (STEADI) falls risk assessment tool, and the visual analog scale (VAS) for pain. The Short Physical Performance Battery (SPPB) was performed at the clinic visit. A total of 310 patients were contacted electronically. No patients (0%) provided consent through their health portal. Of the 310 patients, 200 (65%) consented in person (Ineligible: 67 [21%]; Declined: 43 [14%]), resulting in an 82% response rate. In-person data collection took a median of 38.48 (Range: 12.34-54.30) minutes to complete. It was not feasible to contact and collect older adult patient data electronically prior to clinic; but, was feasible to obtain these patient-reported outcomes and physical performance data in person.

Language: en

Keywords: risk assessment; falls; pain; short physical performance battery; bone mineral density; feasibility study

NSW Fall Prevention & Healthy Ageing Network

Effectiveness of telehealth in preventive care: a study protocol for a randomised controlled trial of tele-exercise programme involving older people with possible sarcopenia or at risk of fall

Chan KOW, Yuen PP, Fong BYF, Law VTS, Ng FSF, Fung WCP, Ng TKC, Cheung IS. BMC Geriatr. 2023; 23(1): e845.

(Copyright © 2023, Holtzbrinck Springer Nature Publishing Group - BMC)

DOI: 10.1186/s12877-023-04535-4 **PMID:** 38093219

Abstract

BACKGROUND: Continuous loss of muscle mass and strength are the consequences of the ageing process, which increase the risk of falls among older people. Falls can lead to severe consequences such as bone fractures and hampered physical and psychological well-being. Regular exercise is the key to reversing muscle atrophy and relieving sarcopenia. However, the frailty of older people and the recent COVID-19 pandemic may affect their confidence to leave home to attend classes in the community. A feasible and effective alternative should be explored.

METHODS: The primary objective is to evaluate the effectiveness of tele-exercise (TE) in relation to physical functioning and exercise adherence among community-dwelling older people at risk of falls in comparison with a community-based group (CB). The secondary objective includes evaluating older people's experience with tele-exercise, emphasizing their psychological welfare, social well-being, and acceptance of the telehealth approach. The design, conduct, and report follow the SPIRIT guidelines (Standard Protocol Items: recommended items to address in a Clinical Trial Protocol and Related Documents). Older people will be recruited from 10 local community centres in Hong Kong and randomly allocated into two groups. All participants will attend the exercise training 3 days per week for 3 months but the mode of delivery will differ, either online as the tele-exercise group (TE) or face-to-face as the community-based group (CB). The outcome measures include muscle strength, physical function, exercise adherence and dropout rate, psychological and social well-being will be assessed at the baseline, and the 3rd, 6th and 12th month. Some participants will be invited to attend focus group interviews to evaluate their overall experience of the tele-exercise training.

DISCUSSION: Tele-exercise reduces the barriers to exercise, such as time constraints, inaccessibility to facilities, and the fear of frail older people leaving their homes. Promoting an online home-based exercise programme for older people can encourage them to engage in regular physical activity and increase their exercise adherence even when remaining at home. The use of telehealth can potentially result in savings in cost and time. The final findings will provide insights on delivering exercise via telehealth to older people and propose an exercise delivery and maintenance model for future practice. TRIAL REGISTRATION: Chinese Clinical Trial Registry (https://www.chictr.org.cn/hvshowprojectEN.html?id=219002&v=1.1), registration number: ChiCTR2200063370. Registered on 5 September 2022.

NSW Fall Prevention & Healthy Ageing Network

Language: en

Keywords: Falls; Older people; Exercise adherence; Tele-exercise

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Falls risk in long-term care residents with cognitive impairment: effects of COVID-19 pandemic

Cheung G, Beyene K, Yan Chan AH, Drayton BA, Jamieson H, Lyndon M, Hikaka J, Ma'u E, Meehan B, Walker X, Rivera-Rodriguez C. J. Am. Med. Dir. Assoc. 2023; ePub(ePub): ePub.

(Copyright © 2023, Lippincott Williams and Wilkins)

DOI: 10.1016/j.jamda.2023.11.006 **PMID:** 38104633

Abstract

OBJECTIVES: The aim of this study was to investigate the impact of the COVID-19 pandemic on falls rates in long-term care residents with cognitive impairment.

DESIGN: An observational study using routinely collected national interRAI data. SETTING AND PARTICIPANTS: Participants were from long-term care residents (age ≥60 years) who received an interRAI Long Term Care Facility assessment anywhere in New Zealand between August 17, 2018, and August 16, 2022.

METHODS: The primary outcome was "At least 1 fall in the last 30 days." Based on the Cognitive Performance Scale (CPS), cognitive impairment was categorized into 3 levels: intact or borderline intact (0-1), mild to moderate impairment (2-3), and moderately to very severe impairment (4-6). The COVID-19 pandemic was divided into 3 periods (First wave: March 21, 2020, to June 8, 2020; Varying level of community outbreaks: June 9, 2020 to August 16, 2021; and Delta-Omicron wave: August 17, 2021, to August 16, 2021) and compared to a pre-COVID-19 period (August 17, 2018, to March 20, 2020). Cox regression modeling was used to study falls and interactions between CPS and COVID-19 pandemic periods, along with other established falls risk factors in the literature.

RESULTS: A total of 282,518 interRAI-LTCF assessments from 75,132 unique residents were included. Interactions between CPS and COVID-19 pandemic periods found that cognitive impairment was associated with a higher hazard ratio (ranged from 1.22 to 1.37) in each of the 3 COVID-19 pandemic periods. We also found unstable health, unsteady gait, wandering, and moderate to severe ADL dependency were the strongest risk factors for falls.

CONCLUSIONS AND IMPLICATIONS: Cognitively impaired long-term care residents had an increased risk for falls during the COVID-19 pandemic. This risk was influenced by several factors. In future pandemic or infection control related isolation, residents who are most at risk can be identified for targeted falls prevention programs.

Language: en

Keywords: dementia; Falls; risk; COVID-19; cognitive impairment; big data; interRAI; long-term care; nursing home

NSW Fall Prevention & Healthy Ageing Network

Poor sleep health predicts the onset of a fear of falling among community-dwelling older adults

Chen TY, Lee S, Hsu KW, Buxton OM. Sleep Health 2023; ePub(ePub): ePub.

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DOI: 10.1016/j.sleh.2023.10.007 **PMID:** 38092638

Abstract

INTRODUCTION: A greater fear of falling predicts disability, falls, and mortality among older adults. Although poor sleep has been identified as a relevant risk factor for fear of falling among older adults, evidence is primarily shown in cross-sectional studies using isolated sleep characteristics. Less is known about whether prior fall experiences change the sleep health-fear of falling link among older adults. We investigated the longitudinal relationship between sleep health and the incidence of fear of falling among community-dwelling older adults and how the association differed between those with or without prior fall experiences.

METHODS: Data were from individuals who completed the sleep module in the National Health and Aging Trends Study (2013-2014; n = 686). Fear of falling was assessed with a single item. Multidimensional sleep health was measured with self-reported sleep items based on the SATED model (ie, sleep satisfaction, daytime alertness, timing, efficiency, and duration). Covariates included sociodemographics, assistive device usage, health, risky behavior, and sleep medications. Multiple logistic regression was used to analyze the data.

RESULTS: Poor sleep health was associated with the onset of fear of falling at 1-year follow-up (odds ratios=1.20, 95% confidence interval=1.02-1.41). Moreover, poor sleep health increased the odds of having fear of falling among individuals without prior falls experiences and elevated the already heightened risks of developing fear of falling among those who fell at baseline.

CONCLUSIONS: Given that fear of falling and experiencing a fall each increase the risk of the other occurring in the future, improving sleep health may prevent older adults from stepping into the vicious cycle of fear of falling and falls.

Language: en

Keywords: Falls; Fear of falling; Multidimensional sleep health; NHATS

NSW Fall Prevention & Healthy Ageing Network

Influence of falls, fall-related injuries, and fear of falling on social participation in people aging with long-term physical disability: a cross-sectional study

Dashner J, Espín-Tello SM, Chen SW, Hollingsworth H, Bollinger R, Morgan KA, Stark S. Disabil. Rehabil. 2023; ePub(ePub): ePub.

(Copyright © 2023, Informa - Taylor and Francis Group)

DOI: 10.1080/09638288.2023.2293990 **PMID:** 38108275

Abstract

PURPOSE: This study examined prevalence and relationships among falls, injuries, fear of falling, and social participation in people aging with long-term physical disability (PAwLTPD).

MATERIALS AND METHODS: A convenience sample of 474 PAwLTPD recruited from community agencies and social media as baseline of a longitudinal cohort study. Inclusion criteria: 45-65 years, self-reported physical disability for ≥5 years, and English-speaking. Self-report surveys of physical/mental health, falls in the past year, fear of falling, and Patient-Reported Outcomes Measurement Information System (PROMIS) ability and satisfaction with participation in social roles and activities measures were collected.

RESULTS: Mean age 56.8 years; participants were mostly female (66.7%) and White (61.4%). Nearly 65% reported a fall; 56.6% of falls resulted in injury. Falls and fall-related injuries were associated with worse physical/mental health and presence of >5 health conditions. Seventy-five percent of participants reported fear of falling. Lower ability and satisfaction with participation were found in participants who fell and worried about falls.

CONCLUSIONS: PAwLTPD are at increased risk of falls, fall-related injuries, and fear of falling, which affects their ability to engage in social activities. Future research is needed to understand circumstances associated with falls and to develop effective interventions to address falls in PAwLTPD.

Language: en

Keywords: Fall rates; fear of falling; influence of falls; people aging with long-term physical disability; social participation

NSW Fall Prevention & Healthy Ageing Network

Exercise for falls prevention in aged care: systematic review and trial endpoint meta-analyses

Dyer SM, Suen J, Kwok WS, Dawson R, McLennan C, Cameron ID, Hill KD, Sherrington C. Age Ageing 2023; 52(12).

(Copyright © 2023, Oxford University Press)

DOI: 10.1093/ageing/afad217 **PMID:** 38109410 **PMCID:** PMC10727475

Abstract

BACKGROUND: There is strong evidence that exercise reduces falls in older people living in the community, but its effectiveness in residential aged care is less clear. This systematic review examines the effectiveness of exercise for falls prevention in residential aged care, meta-analysing outcomes measured immediately after exercise or after post-intervention follow-up.

METHODS: Systematic review and meta-analysis, including randomised controlled trials from a Cochrane review and additional trials, published to December 2022. Trials of exercise as a single intervention compared to usual care, reporting data suitable for meta-analysis of rate or risk of falls, were included. Meta-analyses were conducted according to Cochrane Collaboration methods and quality of evidence rated using the Grading of Recommendations Assessment, Development and Evaluation approach.

RESULTS: 12 trials from the Cochrane review plus 7 new trials were included. At the end of the intervention period, exercise probably reduces the number of falls (13 trials, rate ratio [RaR] = 0.68, 95% confidence interval [CI] = 0.49-0.95), but after post-intervention follow-up exercise had little or no effect (8 trials, RaR = 1.01, 95% CI = 0.80-1.28). The effect on the risk of falling was similar (end of intervention risk ratio (RR) = 0.84, 95% CI = 0.72-0.98, 12 trials; post-intervention follow-up RR = 1.05, 95% CI = 0.92-1.20, 8 trials). There were no significant subgroup differences according to cognitive impairment.

CONCLUSIONS: Exercise is recommended as a fall prevention strategy for older people living in aged care who are willing and able to participate (moderate certainty evidence), but exercise has little or no lasting effect on falls after the end of a programme (high certainty evidence).

Language: en

Keywords: aged; falls; older people; meta-analysis; systematic review; exercise; nursing homes

NSW Fall Prevention & Healthy Ageing Network

Machine learning versus binomial logistic regression analysis for fall risk based on SPPB scores in older adult outpatients

Hasegawa S, Mizokami F, Kameya Y, Hayakawa Y, Watanabe T, Matsui Y. Digit. Health 2023; 9: e20552076231219438.

(Copyright © 2023, SAGE Publishing)

DOI: 10.1177/20552076231219438 **PMID:** 38107982 **PMCID:** PMC10722919

Abstract

OBJECTIVE: To compare the performance of the diagnostic model for fall risk based on the short physical performance battery (SPPB) developed using commercial machine learning software (MLS) and binomial logistic regression analysis (BLRA).

METHODS: We enrolled 797 out of 850 outpatients who visited the clinic between March 2016 and November 2021. Patients were categorized into the development (n = 642) and validation (n = 155) datasets. Age, sex, number of comorbidities, number of medications, body mass index (BMI), calf circumference (left-right average), handgrip strength (left-right average), total SPPB score, and history of falls were determined. We defined fall risk by an SPPB score of ≤6 in men and ≤9 in women. The main metrics used for evaluating the machine learning model and BLRA were the area under the curve (AUC), accuracy, precision, recall (sensitivity), specificity, and F-measure. The commercial MLS automatically calculates the parameter range of the highest contribution.

RESULTS: The participants included 797 outpatients (mean age, 76.3 years; interquartile range, 73.0-81.0; 288 men). The metrics of the current diagnostic model in the commercial MLS were as follows: AUC = 0.78, accuracy = 0.74, precision = 0.46, recall (sensitivity) = 0.81, specificity = 0.71, F-measure = 0.59. The metrics of the current diagnostic model in the BLRA were as follows: AUC = 0.77, accuracy = 0.75, precision = 0.47, recall (sensitivity) = 0.67, specificity = 0.77, F-measure = 0.55. The risk factors for falls in older adult outpatients were handgrip strength, female sex, experience of falls, BMI, and calf circumference in the commercial MLS.

CONCLUSIONS: The diagnostic model for fall risk based on SPPB scores constructed using commercial MLS is noninferior to BLRA.

Language: en

Keywords: Falls; machine learning; binomial logistic regression analysis; diagnostic model; short physical performance battery

NSW Fall Prevention & Healthy Ageing Network

The 'pants-sign': a predictor for falling in people with Parkinson's disease?

Jansen JAF, Tosserams A, Weerdesteyn VGM, Bloem BR, Nonnekes J. J. Parkinsons Dis. 2023; ePub(ePub): ePub.

(Copyright © 2023, IOS Press)

DOI: 10.3233/JPD-230353 **PMID:** 38108362

Abstract

BACKGROUND: A history of falls is the most established predictor of future falls in people with Parkinson's disease (PD). However, predicting a first fall remains challenging.

OBJECTIVE: To assess whether experiencing difficulties putting on pants while standing is a viable predictor of future falling, and specifically a first fall, in persons with PD. We define this 'Pants-sign' as people who resort to putting on their pants only while seated.

METHODS: 264 persons with PD were included. Information on the Pants-sign, history of falls, disease severity (MDS-UPDRS part III), freezing of gait (N-FOGQ> 0), cognitive function (MoCA), self-reported disability (Schwab & England scale), health-related quality of life (SF-12), Timed-Up-and-Go, and one-legged stance were determined at baseline and after one-year follow-up. The association between the Pants-sign and future falling was examined by univariate logistic regression analysis. A multivariate step-wise logistic regression with forward selection was employed to identify the strongest associations in the entire cohort and a sub-cohort of people without falls in the year prior to baseline.

RESULTS: The Pants-sign was univariably associated with a future fall (OR=2.406, 95% CI [1.313-4.409], p=0.004]), but was not an independent predictor in the multivariate logistic regression; predictors were higher MDS-UPDRS part III scores (OR=1.088, 95% CI [1.056-1.121], p< 0.001] and history of falls (OR=5.696, 95% CI [2.650-12.243], p≤0.001]. For the sub-cohort of people without falls in the previous year (n=189), the Pants-sign was not associated with future falls.

CONCLUSIONS: The Pants-sign is simple to assess and is associated with future falling in PD but is not an independent predictor.

Language: en

Keywords: risk factors; falls; Parkinson’s disease; balance; postural instability

NSW Fall Prevention & Healthy Ageing Network

Antiretroviral drug use and the risk of falls in people living with HIV: a systematic review and meta-analysis

Lamichhane P, Koutentakis M, Rathi S, Ode AD, Trivedi H, Zafar S, Lamichhane P, Gupta P, Ghimire R. Ann. Med. Surg. (Lond.) 2023; 85(12): 6105-6114.

(Copyright © 2023, Surgical Associates, Publisher Elsevier Publishing)

DOI: 10.1097/MS9.0000000000001411 **PMID:** 38098550 **PMCID:** PMC10718400

Abstract

OBJECTIVE: The risk of falls in people living with HIV (PLHIVs) on antiretroviral therapy (ART) has received little attention in the literature. The aim of the meta-analysis is to quantify the association between fall risk and various categories of drugs used in ART.
MATERIAL AND METHODS: PubMed, Google Scholar, Embase, and the Cochrane Central Register of Controlled Trials were systematically searched from inception to January 2023. Any observational study or controlled trial that reported on the relationship of at least one antiretroviral drug with falls in PLHIVs was included. Data on the frequency of single fallers, multiple fallers (≥2 falls), and non-fallers were extracted and studied for each drug and drug category. The pooled results were reported as an odds ratio (OR) with a 95% confidence interval (CI).

RESULTS: A total of five observational studies (51 675 participants) were included out of 414 articles obtained through a literature review. Stavudine use was found to be associated with an increased risk of single falls in PLHIVs (OR: 1.69, 95% CI: 1.08-2.66, P=0.02). However, efavirenz (OR: 0.82, 95% CI=0.76-0.89, P<0.001) and zidovudine (OR: 0.82, 95% CI=0.77-0.92, P<0.001) were found protective against the single falls. Didanosine had no significant association with fall risk (OR: 1.23, 95% CI: 0.78-1.93, P=0.37). Likewise, protease inhibitors, integrase inhibitors, nucleoside reverse transcriptase inhibitors, and non-nucleoside reverse transcriptase inhibitors were discovered to have no significant association with fall risk.

CONCLUSION: Most drug categories of ART have no significant association with the risk of falls in PLHIVs. However, certain drugs, such as didanosine and stavudine, which have the inherent effect of causing balance deficits and neuropathy, should be used cautiously.

Language: en

Keywords: HIV; accidental falls; AIDS; antiretroviral therapy; people living with HIV

NSW Fall Prevention & Healthy Ageing Network

Housing environmental factors driving falls among middle-aged and older adults: a national cohort study

Li S, Cui G, Er Y, Ye P, Xue T, Zhang JJ, Liu X, Duan L, Lv F, Yao Y. Innov. Aging 2023; 7(9): igad121.

(Copyright © 2023, Oxford University Press)

DOI: 10.1093/geroni/igad121 **PMID:** 38106373 **PMCID:** PMC10724174

Abstract

BACKGROUND AND OBJECTIVES: Housing is one of the main places where falls occur; however, few studies have examined housing environmental factors driving fall risk. This study aimed to explore the associations between housing environmental factors and falls in China. RESEARCH DESIGN AND METHODS: The study included data of middle-aged and older adults aged ≥45 years from 4 waves of the China Health and Retirement Longitudinal Study. We assessed 7 housing environmental factors: building materials, toilet types, household tidiness, household cooking fuels, and access to electricity, running water, and bathing facilities. Based on these, we divided housing environments into 3 types: good (0-2 poor factors), moderate (3-5 poor factors), and poor (6-7 poor factors). Falls incidence (yes or no) was self-reported during the survey period. We applied the Cox proportional hazard model to estimate the associations, adjusting for a set of covariates such as sociodemographic characteristics, lifestyles, and disease status.

RESULTS: A total of 12,382 participants were analyzed, and the incidence of falls was 31.7%. According to the fully adjusted model, having a squatting toilet (hazard ratio [HR] = 1.14, 95% confidence interval [CI] = 1.03-1.26), household untidiness (HR = 1.09, 95% CI = 1.01-1.18), and solid fuel use for cooking (HR = 1.10, 95% CI = 1.02-1.18) were associated with a higher risk of falls (ps < .05), compared to their counterparts. We found a linear relationship between housing environments and falls (p for trend = .001). Specifically, moderate (HR = 1.16, 95% CI = 1.06-1.27) and poor housing environments (HR = 1.21, 95% CI = 1.08-1.34) were associated with a higher risk of falls compared to a good housing environment.

DISCUSSION AND IMPLICATIONS: Among middle-aged and older Chinese adults, a better household environment, including sitting toilets, tidy living conditions, and clean fuel use for cooking, may reduce the risk of falls. The evidence from our study suggests the need to implement age-friendly housing environments to prevent falls and disability in an aging society.

Language: en

Keywords: Falls; Cohort study; Housing environments; Middle-aged and older adults

NSW Fall Prevention & Healthy Ageing Network

Association of low blood pressure and falls: an analysis of data from the Leiden 85-plus Study

Röthlisberger D, Jungo KT, Bütikofer L, Poortvliet RKE, Gussekloo J, Streit S. PLoS One 2023; 18(12): e0295976.

(Copyright © 2023, Public Library of Science)

DOI: 10.1371/journal.pone.0295976 **PMID:** 38117755

Abstract

BACKGROUND: Falls and consequent injuries are prevalent in older adults. In this group, half of injury-related hospitalizations are associated with falls and the rate of falls increases with age. The evidence on the role of blood pressure and the use of antihypertensive treatment on the risk of falls remains unclear in oldest-old adults (≥85 years).

OBJECTIVES: To examine the association between systolic blood pressure (SBP) and incident falls with medical consequences in oldest-old adults and to analyse whether this association is modified by the use of antihypertensive treatments or the presence of cardiovascular disease.

METHODS: We analysed data from the Leiden 85-plus Study, a prospective, population-based cohort study with adults aged ≥85 years and a 5-year follow-up. Falls with medical consequences were reported by the treating physician of participants. We assessed the association between time-updated systolic blood pressure and the risk of falling over a follow-up period of five years using generalized linear mixed effects models with a binomial distribution and a logit link function. Subgroup analyses were performed to examine the role of antihypertensive treatment and the difference between participant with and without cardiovascular disease.

RESULTS: We analysed data from 544 oldest-old adults, 242 (44.4%) of which used antihypertensives. In 81 individuals (15%) ≥1 fall(s) were reported during the follow-up period. The odds for a fall decreased by a factor of 0.86 (95% CI 0.80 to 0.93) for each increase in blood pressure by 10 mmHg. This effect was specific to blood pressure values above 130mmHg. We did not find any evidence that the effect would be modified by antihypertensive treatment, but that there was a tendency that it would be weaker in participants with cardiovascular disease (OR 0.81, 95% CI 0.72 to 0.90 per 10mmHg) compared to those without cardiovascular disease (OR 0.94, 95% CI 0.84 to 1.05 per 10mmHg).

CONCLUSION: Our results point towards a possible benefit of higher blood pressure in the oldest-old with respect to falls independent of the use of antihypertensive treatments.

Language: en

NSW Fall Prevention & Healthy Ageing Network

A population study on factors associated with unintentional falls among Iranian older adults

Sotoudeh GR, Mohammadi R, Mosallanezhad Z, Viitasara E, Soares JJF. BMC Geriatr. 2023; 23(1): e860.

(Copyright © 2023, Holtzbrinck Springer Nature Publishing Group - BMC)

DOI: 10.1186/s12877-023-04571-0 **PMID:** 38102576

Abstract

INTRODUCTION: Falls among older adults are a significant cause of disability, injury, and death worldwide. The high incidence of falls in older adults, combined with the increased susceptibility to injury of the older adult population, leads to severe global health issues. Further studies are needed to comprehensively evaluate the typical personal and environmental risk factors of falls in the Iranian elderly population. Future preventive strategies and intervention programs will be based on these findings. The study determined the risk factors associated with unintentional falls among a representative sample of older adults living in Tehran, the capital city of Iran.

METHODS: The study design was cross-sectional. The target population was men/women aged 65 years and over from the general population living in 22 different districts of Tehran who were selected by stratified random sampling. The researchers gathered the data using validated questionnaires and observations. The informed consent was obtained from all participants before starting the interview. Multivariate logistic regression analysis examined the association between falls occurring during the past 12 months with demographics/ socioeconomics and fall-related predictor factors.

RESULTS: The risk of falls was higher in women (47.0%) and those aged ≥ 75 years (44.1%). Older adults who were married had their fall risk reduced by 36.4% compared with other types of marital status. Older adults who were illiterate (48.1%), housewives (47.0%), and always had concerns about living expenses (53.9%) tended significantly to have a higher risk of falls. Moreover, participants who live with their family were less likely to fall than those who live alone (36.5% vs. 40.4%). Persons with safe homes were less likely to experience falls than persons with unsafe homes (30.9% vs. 41.4%). The logistic regression analysis showed that the female gender, being worried about living expenses, home safety, functional behavior, and function factors, were independently associated with the risk of falls during the past 12 months.

CONCLUSIONS: Our findings revealed that a wide range of intrinsic and extrinsic risk factors contributed to injurious falls; based on the literature, some are preventable. The present data may be helpful as a starting point and guide future efforts for health providers and policymakers to allocate additional resources and develop proper falls prevention or intervention programs at the community level.

Language: en

NSW Fall Prevention & Healthy Ageing Network

Keywords: Falls; Older adults; Associated factors; Environment hazards; Health status

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Physical activity, physical frailty and depressive symptoms among Chinese male and female older adults: do different indicators make a difference?

Wang Y, Wang X, Zhu X, Sun Y, Han B, Chen T. Front. Public Health 2023; 11: e1280952.

(Copyright © 2023, Frontiers Editorial Office)

DOI: 10.3389/fpubh.2023.1280952 **PMID:** 38089035 **PMCID:** PMC10711064

Abstract

OBJECTIVES: Older adults become more inactive and frailer with aging. Physical status is closely linked to mental health, but it is unclear which physical indicator is more strongly associated with depressive symptoms in older adults. The present study aimed to compare relationships between self-reported physical activity, physical frailty (muscle mass, muscle strength, and gait ability) and depressive symptoms in community male and female older adults.

METHODS: A total of 1,180 adults aged 60 years and older were recruited to participate in this study from a Chinese community receiving annual check-up service from September 2018 to May 2019. Physical activity was assessed by the International Physical Activity Questionnaire (IPAQ). The Bio-electrical Impedance Analyzer was used to determine the muscle mass. As the indicators of muscle function, grip strength and gait ability were assessed by the dynamometer and Timed Up and Go Test (TUGT), respectively. The 15-item version of Geriatric Depression Scale (GDS-15) was used to examine depressive symptoms. Demographic variables, health status and sleep quality were collected using questionnaire.

RESULTS: 11.8% men and 11.9% women reported depressive symptoms. Logistic regression showed that depressive symptoms was associated with low grip strength (OR = 2.42, 95% CI: 1.04-5.63), slow gait ability (OR = 3.60, 95% CI: 1.28-10.13) in older males, and associated with low level of self-reported physical activity (OR = 3.85, 95% CI: 2.00-7.42) in older females. No significant association was found between muscle mass and depressive symptoms.

CONCLUSION: There were gender differences in the relationship between physical activity, physical frailty, and depressive symptoms. Grip strength and gait ability may be a better indicator of frailty for predicting depressive symptoms in older men while physical activity may be useful in predicting depressive symptoms in older women.

Language: en

Keywords: older adults; physical activity; depressive symptoms; grip strength; physical frailty

NSW Fall Prevention & Healthy Ageing Network

Fall status and risk factors in older Chinese adults: a cross-sectional study

Wen P, Sun L, Cheng L, Zhou C, Wang Z, Wang Z. J. Clin. Nurs. 2023; ePub(ePub): ePub.

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Abstract

AIM: To analyse the risk factors and incidence of falls in geriatric outpatients in a university hospital ward in Hangzhou, China.

METHODS: From May 2020 to August 2022, 1712 geriatric outpatients in a university hospital ward in Hangzhou, China, were screened using a socio-demographic questionnaire (e.g. gender, age, living arrangement, etc.) and assessment scales. The correlation between each factor and falls was preliminarily analysed by chi-squared tests. Finally, binary logistic regression analysis was conducted to further analyse the risk factors of falls. The STROBE checklist was used in reporting this study.

RESULTS: Of the 1712 geriatric outpatients recruited, 1626 participants (60-79 and ≥ 80 years old) with complete questionnaire and assessment data were included. The occurrence of falls for those in the 60-79 age group was 8.4%, and for those in the ≥80 age group it was 13.4%. Age ($p = .007$), use of a walking assistance device ($p < .001$), the Stay Independent Brochure Questionnaire (SIB) (OR = 7.751, 95% CI = 5.089-11.806, $p < .001$), living arrangement ($p = .004$), timed up and go test (TUGT) ($p = .007$) and three diseases or above (OR = 2.496, 95% CI = 1.358-11.4.586, $p = .003$) reached statistical significance.

CONCLUSIONS: Older people have a high incidence of falls. In this study, age, disease history, SIB scores (≥4 points), living arrangement, TUGT and walking assistance device increased the probability of falls in older Chinese adults. Personalised interventions should be carried out according to the specific situation of older people to effectively reduce their incidence of falls and improve their quality of life. RELEVANCE TO CLINICAL PRACTICE: The basic characteristics and fall risk factors of the older can help nurses identify fall risk, and early intervention by caregivers can reduce fall-related injuries, which has practical significance for promoting healthy aging. PATIENT OR PUBLIC CONTRIBUTION: The subjects of this study were older patients ≥60 years old, and the demographic characteristics and fall-related information of patients were obtained by questionnaire. The team worked closely with a team of experts in the field of health care. Some researchers collect data and rewrite them, while other researchers analyse the information and write a paper. All authors read and approved the final manuscript.

Language: en

Keywords: risk factors; falls; older persons; cross-sectional study

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Construction and validation of a nomogram for predicting fear of falling related activity restrictions in community-dwelling older adults

Zhang Y, Xue R, Zhou Y, Liu Y, Li Y, Zhang X, Zhang K. Geriatr. Nurs. 2023; 55: 286-296.

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Abstract

Fear of falling related activity restrictions are widespread among older adults, leading to several adverse effects. Given these consequences, there is an urgent need for a comprehensive assessment tool that integrates various risk factors to predict the likelihood of older adults experiencing such activity restrictions. This cross-sectional study investigated fear of falling related activity restrictions and its influencing factors, simultaneously constructed and validated a nomogram among older adults residing in the communities in China. The model includes variables like age, gender, self-rated health, past year injurious falls, gait stability, anxiety, and cognitive impairment. It showed an AUC of 0.892. Internal validation had an AUC of 0.893, and external validation had an AUC of 0.939. Calibration curve showed good fit, and decision curve showed high clinical benefits. It's an intuitive tool for medical professionals to identify older adults at high risk of activity restrictions due to fear of falling.

Language: en

Keywords: Aged; Risk factors; Prediction model; Activity restriction; Nomogram

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