

**SafetyLit 2. March 2019****Common balance measures and fall risk scores among older adults in Pakistan: normative values and correlation**

Siddiqi FA, Masood T, Osama M, Azim ME, Babur MN. *J. Pak. Med. Assoc.* 2019; 69(2): 246-249.

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30804593

**Abstract**

The objective of this study was to assess the balance and fall risk among the community dwelling healthy older adults in Pakistan and to determine the correlation between balance measures and fall risk, for which a cross-sectional correlation study was conducted at Foundation University Islamabad and Fauji Foundation Hospital from March 2016 to February 2017. A total of 77 individuals over 50 years were included via convenience sampling. Individuals with hearing /visual and cognitive impairments, infections, and orthopaedic and severe comorbid conditions were excluded. Data collection tools included Berg Balance Scale (BBS), Timed Up and Go (TUG) test, Functional Reach Test (FRT) and Fall Risk Score (FRS). Independent t-test and Bivariate Pearson Correlation (CI=95%,  $P<0.05$ ) were used for analysis. Mean value of the BBS, FRS, TUG and FRT was  $41.36\pm 2.96$ ,  $3.40\pm 1.47$ ,  $15.90\pm 2.68$  and  $13.34\pm 3.45$  respectively. Age had a significant ( $p<0.05$ ) positive correlation with FRS and negative correlation with BBS. A significant correlation ( $P<0.05$ ) was found only between FRT & TUG and TUG & BBS.

Language: en

**Keywords**

Balance assessment, Berg Balance Scale, Dynamic Posturography, Fall Risk Score, Functional Reach Test, Geriatrics, Pakistan, Timed Up and Go test..

Endnote Y, PDF Y

## Daily physical activity predicts frailty development among community-dwelling older Japanese adults

Yuki A, Otsuka R, Tange C, Nishita Y, Tomida M, Ando F, Shimokata H, Arai H. J. Am. Med. Dir. Assoc. 2019; ePub(ePub): ePub.

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### DOI

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30792108

### Abstract

**OBJECTIVES:** This study examined the association between frailty development and physical activity including the number of steps, the time of light-intensity physical activity (LPA) with <3.0 metabolic equivalents (METs), and the time of moderate- to vigorous-intensity physical activity (MVPA) with  $\geq 3.0$  METs in community-dwelling older Japanese adults.

**DESIGN, SETTING, AND PARTICIPANTS:** Study subjects were 401 older adults at the baseline examination (April 2000-May 2002) who participated at least once in the follow-up examination of the longitudinal study of aging. Their 1787 cumulative data points (mean number of repeat visits, 3.5) were used for analysis. **MEASURES:** The number of steps, time of LPA, and time of MVPA were recorded at baseline using a uniaxial accelerometer. Frailty was defined according to 5 frailty criteria: shrinking, exhaustion, low physical activity, low grip strength, and slow gait speed.

**RESULTS:** The fully adjusted odds ratio for frailty among subjects walking <5000 steps was 1.85 [95% confidence interval (CI), 1.10-3.11]. The fully adjusted odds ratio for frailty among subjects with MVPA for <7.5 minutes was 1.80 (95% CI, 1.05-3.09). No significant association was observed between frailty and LPA.

**CONCLUSIONS AND IMPLICATIONS:** The risk for developing frailty was substantially lower in older people walking  $\geq 5000$  steps/d or exercising for at least 7.5 minutes/d at an intensity  $> 3.0$  METs. These data could be applicable to the community interventions that aim to prevent frailty.

Language: en

### Keywords

NILS-LSA; Number of steps; accelerometer; moderate- to vigorous-intensity physical activity

Endnote Y, PDF

## Disseminating tai chi in the community: promoting home practice and improving balance

Chewning B, Hallisy KM, Mahoney JE, Wilson D, Sangasubana N, Gangnon R. *Gerontologist* 2019; ePub(ePub): ePub.

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### DOI

[10.1093/geront/gnz006](https://doi.org/10.1093/geront/gnz006)

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30811543

### Abstract

**BACKGROUND AND OBJECTIVES:** Falls among older adults is a pressing public health challenge. Considerable research documents that longer tai chi courses can reduce falls and improve balance. However, longer courses can be challenging to implement. Our goal was to evaluate whether a short 6-week modified tai chi course could be effective at reducing falls risk if older adults designed a personal home practice plan to receive a greater tai chi "dose" during the 6 weeks.

**DESIGN:** A 3-city wait-listed randomized trial was conducted. Habituation Intention and Social Cognitive Theories framed the "coaching" strategy by which participants designed practice plans. RE-AIM and Treatment Fidelity Frameworks were used to evaluate implementation and dissemination issues. Three advisory groups advised the study on intervention planning, implementation, and evaluation. To measure effectiveness, we used Centers for Disease Control and Prevention recommended measures for falls risk including leg strength, balance, and mobility and gait. In addition, we measured balance confidence and executive function.

**RESULTS:** Program Implementation resulted in large class sizes, strong participant retention, high program fidelity and effectiveness. Participants reported practicing an average of 6 days a week and more than 25 min/day. Leg strength, tandem balance, mobility and gait, balance confidence, and executive function were significantly better for the experimental group than control group.

**CONCLUSION:** The tai chi short course resulted in substantial tai chi practice by older adults outside of class as well as better physical and executive function. The course reach, retention, fidelity, and implementation across 3 cities suggest strong potential for implementation and dissemination of the 6-week course.

Language: en

### Keywords

Balance; Executive function; Home practice; Tai chi

Endnote Y, PDF Y

## Does aquatic exercise improve commonly reported predisposing risk factors to falls within the elderly? A systematic review

Martínez-Carbonell Guillamón E, Burgess L, Immins T, Martínez-Almagro Andreo A, Wainwright TW. *BMC Geriatr.* 2019; 19(1): e52.

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### Abstract

**BACKGROUND:** According to the World Health Organization, the elderly are at the highest risk of injury or death from a fall. Age-related changes in strength, balance and flexibility are degenerative factors that may increase the risk of falling, and an aquatic training may offer a favourable environment to improve these modifiable risk factors.

**METHODS:** A systematic review was conducted to assess the potential preventative role of aquatic exercise for reducing the risk of falls in the elderly by improving predisposing risk factors. Electronic databases and reference lists of pertinent articles published between 2005 and 2018 were searched. Randomized controlled trials (RCTs) that directly or indirectly addressed the effect of aquatic exercise for the prevention of falls in healthy participants were included within the synthesis. Studies were included if they were reported between January 2005 and May 2018 within a population aged between 60 and 90 years old that were without exercise-affecting comorbidities. Data related to participant demographics, study design, methodology, interventions and outcomes was extracted by one reviewer.

**METHODological quality assessment** was independently performed by two reviewers using the PEDro (Physiotherapy Evidence Database) scale.

**RESULTS:** Fourteen trials met the inclusion criteria. Exercise intervention duration and frequency varied from 2 to 24 weeks, from 2 to 3 times per week, from 40 to 90 min per session. Fall rate was not reported in any of the studies analysed. However, aquatic exercise improved key predisposing physical fitness components that are modifiable and internal risk factors for falling.

**CONCLUSIONS:** There is limited, low-quality evidence to support the use of aquatic exercise for improving physiological components that are risk factors for falling. Although the evidence is limited, and many interventions are not well described, these results should be considered by health and exercise professionals when making evidence-based, clinical decisions regarding training programmes to reduce the risk of falling.

Language: en

**Keywords:** Aquatic exercise; Elderly; Fall prevention; Magnitude of load

Endnote Y, PDF Y

## Effectiveness of a programme delivered in a falls clinic in preventing serious injuries in high-risk older adults: a pre- and post-intervention study

Blain H, Dabas F, Mekhinini S, Picot MC, Miot S, Bousquet J, Boubakri C, Jausse A, Bernard PL. *Maturitas* 2019; 122: 80-86.

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### PMID

30797536

### Abstract

**OBJECTIVE:** To evaluate whether a multifactorial programme delivered in a real practice setting would help prevent serious fall-related injuries in high-risk older patients.

**DESIGN:** A 6-month pre-post intervention study in 134 fallers ( $81.6 \pm 7.2$  years) consecutively referred to a fall prevention clinic after repeated falls in the previous year or after a fall associated with balance, gait, or strength disorders. The programme was delivered by a physiotherapist, an occupational therapist, a podiatrist, and a geriatrician based on a 3-hour fall risk assessment.

**RESULTS:** The proportion of patients with serious and moderate fall-related injuries was significantly lower in the 6 months after than in the 6-months preceding clinic attendance [8 (6.1%) vs 40 (30.5%), and 11 (8.2%) vs 19 (14.2%), respectively;  $p < 0.0001$ ], as were the overall proportion of fallers (32.1% vs 95.4%;  $p < 0.0001$ ) and the number of falls per patient ( $-5.2 \pm -20.4$ ;  $p < 0.0001$ ). When compared with baseline, fear of falling at 6 months was reduced ( $p < 0.05$ ), mobility was maintained, and the proportion of patients with an ADL score  $\leq 2$  was increased (5.6% vs 9.7% respectively;  $p < 0.001$ ). Adherence to the main recommendations and satisfaction with the programme were  $> 75\%$  at 6 months post-clinic.

**CONCLUSIONS:** A multifactorial fall prevention programme delivered by a multidisciplinary geriatric team in older patients at high risk of falling helps to reduce over a 6-month period the risk of serious and moderate injuries related to falls, the risk of falling, and the fear of falling, and helps to maintain mobility and improve functional status.

Language: en

### Keywords

Ageing; Comprehensive geriatric assessment; Falls; Falls prevention clinic; Injurious falls

Endnote Y, PDF Y

## Evaluation of care staff knowledge, confidence, motivation and opportunity for preventing falls in residential aged care settings: A cross-sectional survey

Francis-Coad J, Hang JA, Etherton-Bear C, Ellis A, Hill AM. *Int. J. Older People Nurs.* 2019; ePub(ePub): ePub.

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### PMID

30811899

### Abstract

**AIMS:** To explore care staff knowledge about falls and confidence, motivation and opportunity to undertake fall prevention strategies, in residential aged care (RAC) along with preferences for fall prevention education.

**BACKGROUND:** Falls account for the majority of adverse clinical events in RAC settings. Care staff in RAC settings are in a key position to influence residents' actions to prevent falls, provided they have the necessary knowledge and skills.

**METHODS:** A cross-sectional survey design with a purposive sample of 147 care staff at eight RAC facilities was undertaken in 2015. A custom-designed questionnaire examining knowledge, confidence, motivation and opportunity to undertake falls prevention strategies was used.

**RESULTS:** Only 39 (26.5%) care staff were aware that the residents they cared for were at high risk of falls. Care staff knowledge of intrinsic falls risk factors was very limited, for example, only 18 (13.53%) observed for side effects of medication and just four (1.04%) were aware of continence issues. Conflicting duties also limited care staff time to undertake falls prevention strategies. Preferences for falls prevention education indicated face-to-face interactive discussions in the workplace (n = 98, [66.7%]) with reminder posters displayed around the facility (n = 80, [70.8%]).

**CONCLUSIONS:** Residential aged care organisations need to engage with care staff to provide tailored falls education incorporating learning preferences and targeting knowledge gaps, to improve awareness of intrinsic risk factor impact and uptake of evidence-based prevention strategies. Despite care staff being highly motivated, they have limited opportunity to assist residents with fall prevention within their workload. RAC management and funding bodies must address opportunity for care staff to fulfil this crucial role to benefit resident safety. **IMPLICATION FOR PRACTICE:** This study identified gaps in care staffs' knowledge and skills in undertaking falls prevention strategies in residential aged care settings. These findings will assist residential aged care organisations and health professional educators to design evidence-based falls prevention education tailored to their care staffs' needs and preferences to facilitate adoption.

Language: en

Endnote Y, PDF Y

### Exercise prevents fall-related injuries in older people

Lord S. Nat. Rev. Endocrinol. 2019; ePub(ePub): ePub.

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#### News and Views article

Language: en

Endnote Y, PDF Y

### Falls and fear of falling in a sample of centenarians: the role of multimorbidity, pain and anxiety

Teixeira L, Araújo L, Duarte N, Ribeiro O. Psychogeriatr. 2019; ePub(ePub): ePub.

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#### Abstract

**BACKGROUND:** To explore the recent history of falls and the existence of fear of falling in a sample of centenarians, and to identify factors associated with both conditions.

**METHODS:** The sample included 109 centenarians from two Portuguese studies. The two main outcomes of this study are fear of falling and history of fall(s).

**RESULTS:** Results revealed that more than a half (51.4%) of the participants had fallen in the last 5 years and that the percentage of fear of falling was 78.9%. No association was found between the two conditions. The factors associated with each one were found to be different: number of health conditions for history of falls, and pain frequency and anxiety for fear of falling.

**CONCLUSIONS:** The relationship between anxiety and fear of falling reinforces the importance of screening both conditions as it can improve their detection and treatment. The established relationship between a high number of health conditions (common at very advanced ages) and falls demands greater attention in fall prevention initiatives specifically targeted to the extremely elderly.

**Keywords:** anxiety; centenarians; falls; fear of falling; multimorbidity

Endnote Y, PDF Y



## How do patients improve their timed up and go test? Responsiveness to rehabilitation of the TUG test in elderly neurological patients

Caronni A, Picardi M, Aristidou E, Antoniotti P, Pintavalle G, Redaelli V, Sterpi I, Corbo M. Gait Posture 2019; 70: 33-38.

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### DOI

[10.1016/j.gaitpost.2019.02.010](https://doi.org/10.1016/j.gaitpost.2019.02.010)

### PMID

30802642

### Abstract

**BACKGROUND:** The timed up and go (TUG) test is widely used for assessing treatments effectiveness on elderly mobility. Although the TUG test consists of different tasks (e.g. walking and turning), the total TUG duration (TTD) is usually the only outcome measure, with TTD shortening indicating the patient's improvement. **RESEARCH QUESTION:** Does TTD shortening reflect the improvement of each TUG tasks or does it reflect the improvement of only some of them? **METHODS:** This retrospective study recruited 120 elderly patients (mean, SD: 76.9, 6.6 years) admitted to inpatient rehabilitation because of an acute or chronic neurological disease (acute patients, AP; chronic patients, CP). TTD and TUG tasks duration was measured on admission and discharge (five trials/session) by means of the instrumental TUG test (ITUG). Likelihood ratios (LRs) were used for inferring TUG tasks improvement from TTD improvement. TTD and TUG tasks have improved if at least four measurements on discharge were shorter than the shortest measurement on admission.

**RESULTS:** TTD improvement per se is not enough to claim that all the TUG tasks have improved ( $LR^+_{AP} = 1.32$ ;  $LR^+_{CP} = 1.85$ ). Conversely, if TTD has not improved, not even a single TUG task has improved ( $LR^-_{AP} = 0.13$ ;  $LR^-_{CP} = 0.19$ ). If TTD has improved, there is at least one TUG task that actually improved ( $LR^+_{AP} = 3.17$ ;  $LR^+_{CP} = 9.54$ ). The improvement of all TUG tasks can be only inferred in the (unusual) event of a large TTD shortening (AP: >39%,  $LR^+_{AP} = 6.26$ ; CP: >30%,  $LR^+_{CP} = 9.0$ ).

**SIGNIFICANCE:** In most cases, TTD improvement is not associated with the improvement of all TUG tasks. Moreover, when TTD has improved there is at least a TUG task that has improved, but that remains unknown. To actually understand how treatments ameliorate patients' mobility, ITUG with TUG task duration measurement should be preferred to TTD.

Language: en

### Keywords

Balance and locomotor impairment; Elderly; ITUG; Instrumental timed up and go test; Rehabilitation; Responsiveness

Endnote Y, PDF Y



## Incidence of lower-extremity fractures in US nursing homes

Sine K, Lee Y, Zullo AR, Daiello LA, Zhang T, Berry SD. *J. Am. Geriatr. Soc.* 2019; ePub(ePub): ePub.

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### PMID

30811581

### Abstract

**BACKGROUND/OBJECTIVES:** Limited studies suggest lower-extremity (LE) fractures are morbid events for nursing home (NH) residents. Our objective was to conduct a nationwide study comparing the incidence and resident characteristics associated with hip (proximal femur) vs nonhip LE (femoral shaft and tibia-fibula) fractures in the NH.

**DESIGN:** Retrospective cohort study. **SETTING:** US NHs. **PARTICIPANTS:** We included all long-stay residents, aged 65 years or older, enrolled in Medicare from January 1, 2008, to December 31, 2009 (N = 1 257 279). Residents were followed from long-stay qualification until the first event of LE fracture, death, or end of follow-up (2 years). **MEASUREMENTS:** Fractures were classified using Medicare diagnostic and procedural codes. Function, cognition, and medical status were obtained from the Minimum Data Set prior to long-stay qualification. Incidence rates (IRs) were calculated as the total number of fractures divided by person-years.

**RESULTS:** During 42 800 person-years of follow-up, 52 177 residents had an LE fracture (43 695 hip, 6001 femoral shaft, 2481 tibia-fibula). The unadjusted IRs of LE fractures were 1.32/1000 person-years (95% confidence interval [CI] = 1.27-1.38) for tibia-fibula, 3.20/1000 person-years (95% CI = 3.12-3.29) for femoral shaft, and 23.32/1000 person-years (95% CI = 23.11-23.54) for hip. As compared with hip fracture residents, non-hip LE fracture residents were more likely to be immobile (58.1% vs 18.4%), to be dependent in all activities of daily living (31.6% vs 10.8%), to be transferred mechanically (20.5% vs 4.4%), to be overweight (mean body mass index = 26.6 vs 24.0 kg/m<sup>2</sup>), and to have diabetes (34.8% vs 25.7%).

**CONCLUSIONS:** Our findings that non-hip LE fractures often occur in severely functionally impaired residents suggest these fractures may have a different mechanism of injury than hip fractures. The resident differences in our study highlight the need for distinct prevention strategies for hip and non-hip LE fractures.

Language: en

**Keywords:** femoral shaft fracture; hip fracture; long-term care; nursing home; tibia-fibula fracture

Endnote Y, PDF Y

## Multisite pain and self-reported falls in older people: systematic review and meta-analysis

Welsh VK, Clarson LE, Mallen CD, McBeth J. *Arthritis Res. Ther.* 2019; 21(1): e67.

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### DOI

[10.1186/s13075-019-1847-5](https://doi.org/10.1186/s13075-019-1847-5)

### PMID

30795790

### Abstract

**BACKGROUND:** Multisite pain and falls are common in older people, and isolated studies have identified multisite pain as a potential falls risk factor. This study aims to synthesise published literature to further explore the relationship between multisite pain and falls and to quantify associated risks.

**METHODS:** Bibliographic databases were searched from inception to December 2017. Studies of community-dwelling adults aged 50 years and older with a multisite pain measurement and a falls outcome were included. Two reviewers screened articles, undertook quality assessment and extracted data. Random-effects meta-analysis was used to pool the effect estimate (odds ratio (OR) and 95% confidence interval (95%CI)). Heterogeneity was assessed by  $I^2$ ; sensitivity analyses used adjusted risk estimates and exclusively longitudinal studies.

**RESULTS:** The search identified 49,577 articles, 3145 underwent abstract review, 22 articles were included in the systematic review and 18 were included in the meta-analysis. The unadjusted pooled OR of 1.82 (95%CI 1.55-2.13), demonstrating that those reporting multisite pain are at increased risk of falls, is supported by the adjusted pooled OR of 1.56 (95%CI 1.39-1.74). Multisite pain predicts future falls risk (OR = 1.74 (95%CI 1.57-1.93)). For high-quality studies, those reporting multisite pain have double the odds of a future fall compared to their pain-free counterparts.

**CONCLUSION:** Multisite pain is associated with an increased future falls risk in community-dwelling older people. Increasing public awareness of multisite pain as a falls risk factor and advising health and social care professionals to identify older people with multisite pain to signpost accordingly will enable timely falls prevention strategies to be implemented.

Language: en

### Keywords

Falls prevention; Musculoskeletal pain; Public health

Endnote Y, PDF

## Overview of the cholinergic contribution to gait, balance and falls in Parkinson's disease

Morris R, Martini DN, Madhyastha T, Kelly VE, Grabowski TJ, Nutt J, Horak F. Parkinsonism Relat. Disord. 2019; ePub(ePub): ePub.

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### DOI

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### PMID

30796007

### Abstract

Mobility deficits, including gait disturbance, balance impairments and falls, are common features of Parkinson's disease (PD) that negatively impact quality of life. Mobility deficits respond poorly to dopaminergic medications, indicating a role for additional neurotransmitters. Due to the critical role of cortical input to gait and balance, acetylcholine-an essential neurotransmitter system for attention-has become an area of interest for mobility. This review aimed to identify the role of cholinergic function on gait, balance, and falls in PD using three techniques; pharmacological, imaging, and electrophysiological. Studies supported the role of the cholinergic system for mobility in PD, with the most promising evidence indicating a role in falls. Imaging studies demonstrated involvement of anterior cholinergic (basal forebrain) systems in gait, and posterior (brainstem) systems in balance. However, this review identified a small number of studies which used varying protocols, making comparisons difficult. Further studies are warranted, measuring comprehensive gait and balance characteristics as well as gold standard falls detection to further quantify the relationship between ACh and mobility in PD.

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Language: en

### Keywords

Acetylcholine; Balance; Falls; Gait; Parkinson's disease

Endnote Y, PDF Y

## Risk factors and epidemiological profile of hip fractures in Indian population: a case-control study

Ahuja K, Sen S, Dhanwal D. Osteoporos Sarcopenia 2017; 3(3): 138-148.

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PMCID: [PMC6372827](https://pubmed.ncbi.nlm.nih.gov/30775519/)

### Abstract

**OBJECTIVES:** This analytic retrospective case-control study was designed to analyze risk factors and the epidemiological profile of hip fractures among the Indian population with special importance to the mechanism of injuries.

**METHODS:** Patients of hip fractures (n = 41) and age- and sex-matched healthy volunteers (n = 41) were interviewed by a questionnaire regarding the occurrence of the fracture, past history of diseases and long-term medication usage, past and physical activity, supplements, smoking, and alcohol intake. The data were tabulated using descriptive statistics and logistic regression was used to determine significant risk factors.

**RESULTS:** Age group 60-69 was found to be most affected by hip fractures, though an early onset of fractures was noted in males. Falls due to slipping indoors from standing position was found very commonly. However, an increasing trend of falls was noted from lying down position in the older age groups which was more common during the morning and night hours. Logistic regression analysis for the detection of risk factors was applied to the various variables in the questionnaire. Active status in the past was inversely related (odds ratio [OR], 0.33; P < 0.05) to fracture risk while alternative medication usage in the past 1 year (OR, 4.086; P < 0.05) and significant alcohol consumption were directly associated with fracture risk (OR, 5.484; P < 0.05). A potential inverse relation of use of calcium supplements in the past 3 months and fracture risk (OR, 0.872) was seen, although this was not significant. A potential positive relation of smoking with hip fractures was also seen, but not found significant (OR, 2.204).

**CONCLUSIONS:** Hip fractures in the elderly population are on a rising trend especially in the Indian subcontinent due to a number of factors both hereditary and acquired. Simple measures like routine usage of bedside railing, wall-side railings at an appropriate height, high friction tiles inside rooms and washrooms, and adequate lighting indoors can play a significant role in reducing falls and hip fractures among the elderly.

Language: en

**Keywords:** Hip fracture; Osteoporosis; Physical activity scoring; Risk factors

Endnote Y, PDF Y

## The relationship between discharge medications and falls in post-hospitalised older adults: a 6-month follow-up

Lam K, Lee DA, Lalor AF, Stolwyk R, Russell G, Brown T, McDermott F, Haines TP. *Australas. J. Ageing* 2019; ePub(ePub): ePub.

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[10.1111/ajag.12628](https://doi.org/10.1111/ajag.12628)

### PMID

30806033

### Abstract

**OBJECTIVE:** To identify discharge medications, especially psychotropic medications that are associated with falls, amongst older adults within 6 months following hospitalisation.

**METHODS:** Negative binomial regression was used to examine relationships between discharge medications and falls in older post-hospitalised adults. Multiple regression that considered falls risk factors at discharge was performed.

**RESULTS:** Data for 267 participants showed that discharge medications were not independently associated with falls postdischarge after adjustment for other falls risk factors. Male gender (adjusted incidence rate ratio [95% confidence interval, CI] 2.15 [1.36-3.40]), higher depression scores (1.14 [1.05-1.25]) and co-morbidity of neurological disease other than stroke (5.98 [3.08-11.60]) were independently associated with an increased rate of falls. Higher depression scores (1.20 [1.11-1.31]) and co-morbidity of cancer (1.97 [1.20-3.25]) were independently associated with an increased rate of injurious falls in the 6 months postdischarge.

**CONCLUSION:** Falls prevention strategies, other than hospital discharge medication management in the postdischarge older adults, warrant investigation.

Language: en

### Keywords

Medication Therapy Management; aged; discharge; falls; hospitals; patient

Endnote Y, PDF Y

## Chinese martial art training failed to improve balance or inhibit falls in older adults

Ma AWW, Wang HK, Chen DR, Chen YM, Chak YTC, Chan JWY, Yam TTT, Cheng YTY, Ganesan B, Fong SSM. *Percept. Mot. Skills* 2019; ePub(ePub): ePub.

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30803309

### Abstract

This randomized controlled trial explored the effects of a Ving Tsun (VT) Chinese martial art training program on reactive standing balance performance, postural muscle reflex contraction latency, leg muscle performance, balance confidence and falls in community-dwelling older adults. We randomly assigned 33 healthy older adults to either a VT group (mean age = 67.5 years) or a control group (mean age = 72.1 years). The VT group received two 1-hour VT training sessions per week for three months (24 sessions). Primary outcome measures collected before and after the intervention period were electromyographic muscle activation onset latencies of the hamstring and gastrocnemius and the center of pressure path, length and movement velocity in standing (reactive balance performance). Secondary outcome measures included isometric peak force and time to isometric peak force of the knee extensors and flexors, the Activities-Specific Balance Confidence Scale score, and fall history.

RESULTS revealed that the mean gastrocnemius muscle activation onset latency was significantly longer (22.53 ms) in the VT group after the intervention. The peak force of the knee flexors significantly increased (by 1.58 kg) in the control group over time but not in the VT group. The time to reach peak force in the knee flexors was significantly longer (by 0.51 s) in the control group (but not the VT group) at posttest compared with the pretest value. No other significant group, time, or group-by-time interaction effects were noted. We discussed possible reasons for the failure of three months of martial art training to benefit fall risks among these older adults.

Language: en

### Keywords

balance self-efficacy; elderly; fall; martial exercise; muscle strength; postural control

Endnote Y, PDF Y

## Evaluation of inertial sensor-based pre-impact fall detection algorithms using public dataset

Ahn S, Kim J, Koo B, Kim Y. *Sensors (Basel)* 2019; 19(4): s19040774.

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### Abstract

In this study, pre-impact fall detection algorithms were developed based on data gathered by a custom-made inertial measurement unit (IMU). Four types of simulated falls were performed by 40 healthy subjects (age:  $23.4 \pm 4.4$  years). The IMU recorded acceleration and angular velocity during all activities. Acceleration, angular velocity, and trunk inclination thresholds were set to 0.9 g,  $47.3^\circ/\text{s}$ , and  $24.7^\circ$ , respectively, for a pre-impact fall detection algorithm using vertical angles (VA algorithm); and 0.9 g,  $47.3^\circ/\text{s}$ , and 0.19, respectively, for an algorithm using the triangle feature (TF algorithm). The algorithms were validated by the results of a blind test using four types of simulated falls and six types of activities of daily living (ADL). VA and TF algorithms resulted in lead times of  $401 \pm 46.9$  ms and  $427 \pm 45.9$  ms, respectively. Both algorithms were able to detect falls with 100% accuracy. The performance of the algorithms was evaluated using a public dataset. Both algorithms detected every fall in the SisFall dataset with 100% sensitivity). The VA algorithm had a specificity of 78.3%, and TF algorithm had a specificity of 83.9%. The algorithms had higher specificity when interpreting data from elderly subjects. This study showed that algorithms using angles could more accurately detect falls. Public datasets are needed to improve the accuracy of the algorithms.

Language: en

**Keywords:** ADLs; IMU; fall detection algorithm; falls; lead time; public dataset

Endnote Y, PDF Y



## Incidence of head injury and traumatic brain injury among people with Alzheimer's disease

Ilmaniemi S, Taipale H, Tanskanen A, Tiihonen J, Hartikainen S, Tolppanen AM. J. Epidemiol. Community Health 2019; ePub(ePub): ePub.

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### Abstract

**BACKGROUND:** Injuries caused by falling are a major health concern among older population. For older people, falls are the leading cause of head injuries; especially, persons with cognitive disorders have an increased risk of falling.

**OBJECTIVE:** To compare the incidence of head injury and traumatic brain injury (TBI) among persons with Alzheimer's disease (AD) with persons without AD.

**METHODS:** This register-based study was conducted on a nationwide cohort, which includes all community-dwelling persons diagnosed with AD in Finland in 2005-2011. Persons with previous head injuries were excluded, leaving 67 172 persons with AD. For each person with AD, a matching person without AD and previous head injury were identified with respect to age, sex and university hospital district. The Cox proportional hazard model and competing risk analyses were used to estimate HR for head injury and TBI.

**RESULTS:** Persons with AD had 1.34-fold (95% CI 1.29 to 1.40) risk of head injuries and 1.49-fold (95% CI 1.40 to 1.59) risk of TBIs after accounting for competing risks of death and full adjustment by socioeconomic status, drug use and comorbidities.

**CONCLUSION:** Persons with AD are more likely to have a head injury or TBI incident than persons without AD.

Language: en

**Keywords:** dementia; injuries; registers

Endnote Y, PDF Y

## Using a fall prevention checklist to reduce hospital falls: results of a quality improvement project

Johnston M, Magnan MA. *Am. J. Nurs.* 2019; 119(3): 43-49.

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30801319

### Abstract

**Purpose:** This quality improvement (QI) initiative aimed to promote patient safety by improving adherence to an existing hospital-approved fall prevention protocol. Specific aims of the initiative were to evaluate the impact of using a fall prevention checklist on (1) the implementation of a bundle of 14 specific interventions (the fall prevention protocol) and (2) the incidence of falls on participating units.

**METHODS:** A QI team conducted a 26-day fall prevention initiative. Data were collected on day and night shifts for 13 days each. We evaluated the effect of using a new 14-item checklist based on the existing hospital-approved fall prevention protocol on the nursing staff's adherence to each intervention and on the incidence of falls on the test unit. Oncoming staff used the checklist during change-of-shift handoffs to determine whether all prevention interventions were in place before accepting care of the patient. The incidence of falls was tracked daily.

**RESULTS:** Thirty-seven nursing staff members (RNs and nursing assistants) participated in the pilot study and completed 90 fall prevention checklists. The most frequently missed intervention was setting the bed alarm, which was set incorrectly 19% of the time. There were no patient falls during the pilot study.

**CONCLUSION:** By evaluating staff use of the fall prevention checklist, the QI team identified frequently missed prevention interventions and areas for improvement in the hospital's fall prevention protocol. A more comprehensive test of the fall prevention checklist's impact on fall prevention is needed.

Language: en

Endnote Y, PDF Y