

Safety Literature 11th June 2023**Assessing falls in the elderly population using G-STRIDE foot-mounted inertial sensor**

Álvarez MN, Ruiz ARJ, Neira GGV, Huertas-Hoyas E, Cerda MTE, Delgado LP, Robles ER, Del-Ama AJ, Ruiz-Ruiz L, García-de-Villa S, Rodríguez-Sánchez C. Sci. Rep. 2023; 13(1): e9208.

(Copyright © 2023, Nature Publishing Group)

DOI 10.1038/s41598-023-36241-x **PMID** 37280388

Abstract

Falls are one of the main concerns in the elderly population due to their high prevalence and associated consequences. Guidelines for the management of the elder with falls are comprised of multidimensional assessments, especially gait and balance. Daily clinical practice needs for timely, effortless, and precise tools to assess gait. This work presents the clinical validation of the G-STRIDE system, a 6-axis inertial measurement unit (IMU) with onboard processing algorithms, that allows the calculation of walking-related metrics correlated with clinical markers of fall risk. A cross-sectional case-control study was conducted with 163 participants (falls and non-falls groups). All volunteers were assessed with clinical scales and conducted a 15-min walking test at a self-selected pace while wearing the G-STRIDE. G-STRIDE is a low-cost solution to facilitate the transfer to society and clinical evaluations. It is open hardware and flexible and, thus, has the advantage of providing runtime data processing. Walking descriptors were derived from the device, and a correlation analysis was conducted between walking and clinical variables. G-STRIDE allowed measuring walking parameters in non-restricted walking conditions (e.g. hallway). Walking parameters statistically discriminate between falls and non-falls groups. We found good/excellent estimation accuracy ($ICC = 0.885$; [Formula: see text]) for walking speed, showing good/excellent correlation between gait speed and several clinical variables. G-STRIDE can calculate walking-related metrics that allow for discrimination between falls and non-falls groups, which correlates with clinical indicators of fall risk. A preliminary fall-risk assessment based on the walking parameters was found to improve the Timed Up and Go test in the identification of fallers.

Language: en

Association between multimorbidity and falls and fear of falling among older adults in eastern China: a cross-sectional study

You L, Guo L, Li N, Zhong J, Er Y, Zhao M. Front. Public Health 2023; 11: e1146899.

(Copyright © 2023, Frontiers Editorial Office)

DOI 10.3389/fpubh.2023.1146899 PMID 37275486

Abstract

BACKGROUND: Growing evidence has reported an association between multimorbidity and falls and fear of falling (FOF) in older adults, however, the results regarding this association from China are limited. Our study aimed to investigate the association between multimorbidity and falls and FOF in older adults in eastern China.

METHODS: We conducted a cross-sectional study in Zhejiang Province, Eastern China, which recruited a provincial representative sample of adults aged ≥ 60 years. A structured questionnaire including demographic characteristics, chronic diseases, history of falls in the past 12 months, and FOF, was administered by all participants. The exposure variable was multimorbidity, which was defined as the presence of two or more chronic diseases and medical conditions in the same individual. The outcomes included a history of falls and FOF. Multivariate logistic regression was used to evaluate the association between multimorbidity and falls and FOF in older adults.

RESULTS: In total of 7,774 participants were included in the analysis, among whom 3,898 (50.1%) were female, with a mean \pm standard deviation age is 72.9 ± 8.4 years. Multimorbidity was associated with the increased risk of falling in older adults [adjusted odds ratio (OR), 1.99; 95% confidence interval (CI):1.55-2.36]. The ORs for having experienced single fall and repeated falls were 1.85 (95% CI: 1.42-2.42) and 3.45 (95% CI: 1.47-6.97), respectively, with multimorbidity compared with those without chronic diseases. The older adults with multimorbidity were more likely to report FOF compared with those without chronic diseases (adjusted OR, 1.49; 95%CI:1.30-1.70). Moreover, the association between multimorbidity and FOF remained significant in the older adults with a history of fall (OR, 1.57; 95%CI:1.04-2.38).

CONCLUSION: The association between multimorbidity and falls and FOF is significant in the Chinese population and the effects of multimorbidity on falls and FOF do not vary according to the frequency and history of falls in older adults.

Language: en

Keywords

geriatrics; older adults; falls; fear of falling; fall risk; multimorbidity

Association between toileting and falls in older adults admitted to the emergency department and hospitalised: a cross-sectional study

Zou M, Lu R, Jiang Y, Liu P, Tian B, Liang Y, Wang XL, Jiang L. BMJ Open 2023; 13(6): e065544.

(Copyright © 2023, BMJ Publishing Group)

DOI 10.1136/bmjopen-2022-065544 **PMID** 37263694

Abstract

OBJECTIVES: This study aimed to explore the potential risk factors associated with toileting-related falls in community-dwelling older adults who presented to the emergency department and were subsequently hospitalised.

DESIGN: This was a cross-sectional study. **SETTING AND PARTICIPANTS:** This study was conducted in two teaching hospitals in Shanghai, China between October 2019 and December 2021 among community-dwelling adults aged ≥ 60 years.

METHODS: In-person interviews, physical assessment and medical record review were performed to collect data on the characteristics and risk factors of falls. Associations of toileting-related falls with demographic characteristics and geriatric syndromes were examined using logistic regression models. **MAIN OUTCOME MEASURES:** Potential risk factors for toileting-related falls.

RESULTS: This study included 419 older patients with a mean age of 73.8 ± 9.7 years. Among 60 (14.3%) patients with toileting-related falls (mean age: 78.8 ± 9.2 years), 63.3% of toileting-related falls, mainly occurred between 00:00 and 05:59 hours, compared with 17.3% of non-toileting-related falls, which primarily occurred during the daytime. The rate of recurrent falls (35%) was significantly higher in the toileting-related falls group than in the non-toileting-related falls group (21.2%) ($p=0.02$). Logistic regression showed that visual impairment (OR 2.7, 95% CI 1.1 to 7.1), cognitive impairment (OR 3.3, 95% CI 1.3 to 8.4), gait instability (OR 3.1, 95% CI 1.1 to 8.8) and urinary incontinence (OR 3.4, 95% CI 1.2 to 9.9) were strongly associated with toileting-related falls. Twenty-three (38.3%) patients in the toileting-related falls group had moderate and severe injuries, compared with 71.7% in the non-toileting-related falls group ($p<0.05$).

CONCLUSIONS: This study revealed that patients who reported toileting-related falls were more likely to have cognitive impairment, urinary incontinence, gait instability, visual impairment than patients who fell during other activities. Social and healthcare professionals should prioritise the management of toileting activities in older patients and provide targeted interventions to those in the high-risk group.

Language: en

Keywords

Aged; Risk management; Public health; ACCIDENT & EMERGENCY MEDICINE; GERIATRIC MEDICINE

Association of vitamins B12 and D3 with balance and falls in a sample of Greek older people

Stolakis K, Megas P, Panagiotopoulos E, Mentis M, Antoniadou E, Kalivioti X, Tyllianakis M, Kokkalis Z. J. Musculoskelet. Neuronal. Interact. 2023; 23(2): 205-214.

(Copyright © 2023, International Society of Musculoskeletal and Neuronal Interactions)

DOI unavailable **PMID** 37259660

Abstract

OBJECTIVES: Balance disorders and falls are common in the elderly and have a multifactorial etiology. The purpose of the present cross-sectional study is to evaluate a possible association between vitamins D3 and B12 and impaired balance and falls.

METHODS: Ninety patients, females and males, were evaluated, from December 2019 to December 2020 during their first ambulatory visit at the Prevention of Falls Clinic of the General University Hospital of Patras. Vitamins B12 and D3 levels were measured. The number of falls during the last 12 months was recorded and patients were assessed using Mini-Balance Evaluation Systems Test (Mini-BESTest), Fried Phenotype, Walking Speed, Hand Grip Strength, Short Physical Performance Battery.

RESULTS: A multiple linear regression analysis showed that Mini-BESTest are statistically significantly predicted, $F(10,79)=18.734$, $p<0.001$, adj. $R(2)=0.70$ from Vit-B12 and FRIED Phenotype (pre-frail vs non-frail). Similarly, in the multiple binary logistic regression analysis, falls were statistically significantly predicted from FRIED Phenotype (pre-frail vs non-frail) $\chi^2(5)=63.918$, $p<0.001$, Nagelkerke $R^2=0.68$.

CONCLUSIONS: Higher levels of vitamins B12 but not of D3 are associated with better balance but not with less falls in a sample of community-dwelling older people.

Language: en

Keywords

Female; Male; Cross-Sectional Studies; Animals; Falls; *Hand Strength; *Vitamin B 12; Balance; Greece/epidemiology; Mini-BESTest; Postural Balance; Vitamin B12; Vitamin D; Vitamins

Everyday experiences of physical function and awareness of fall risk in older adulthood

Mejía ST, Su TT, Washington FC, Golinski S, Sosnoff JJ. *Innov. Aging* 2023; 7(4): igad037.

(Copyright © 2023, Oxford University Press)

DOI 10.1093/geroni/igad037 **PMID** 37273259

Abstract

BACKGROUND AND OBJECTIVES: Falls, the leading cause of death and disability among older adults, occur in daily life when the demands of daily activities surpass the ability to maintain balance. An estimated 30% of older adults misestimate their physical function, placing them at greater risk of falling. This study examined how experiences of physical function are linked to awareness of fall risk in daily life. **RESEARCH DESIGN AND METHODS:** For 30 consecutive days following a fall-risk assessment, 41 older adults (observations = 1,135; 56% women; age: 65-91) self-assessed objective and subjective fall risk using a custom smartphone application. Alignment of objective and subjective fall risk was indexed as awareness of fall risk. Postural sway was measured by the application. Physical and mobility symptoms and fear of falling were reported daily.

RESULTS: At baseline, 49% of participants misestimated their fall risk. Awareness of fall risk varied from day to day and fall risk was misestimated on 40% of days. Multilevel multinomial models showed individual differences in the level of daily symptoms to increase the tendency to misestimate fall risk. Daily symptoms and fear of falling increased awareness of high fall risk, but daily symptoms threatened awareness of low fall risk.

DISCUSSION AND IMPLICATIONS: Findings suggest that misestimation of fall risk is common in older adulthood and informed by appraisals of physical function. Fall prevention strategies could support older adults in understanding their everyday physical function and provide tools to adjust the demands of activities in daily life.

Language: en

Keywords

Fall prevention; Microlongitudinal study; Objective and subjective fall risk; Subjective aging; Within-person processes

Falls among older adults during the COVID-19 pandemic compared to a pre-pandemic period: a case-control study

Zayat MN, Griend MV, Flesher N, Lightwine K, Ablah E, Okut H, Haan JM. Am. Surg. 2023; ePub(ePub): ePub.

(Copyright © 2023, Southeastern Surgical Congress)

DOI 10.1177/00031348231180919 **PMID** 37285470

Abstract

BACKGROUND: Little is known about how the COVID-19 pandemic impacted older adults admitted to the hospital with fall-related injuries. This research sought to determine if there was a difference in patient characteristics and hospital outcomes among older adults with fall-related injuries during the COVID-19 pandemic compared to a non-pandemic period.

METHODS: A retrospective chart review of patients 65 years or older admitted for traumatic falls before and during COVID-19 was undertaken. Data abstracted included demographics, fall details, injury data, and hospital course.

RESULTS: Of 1598 patients, 50.5% presented during COVID-19 (cases), and 49.5% presented pre-pandemic (controls). Fewer cases fell in rural areas (28.6% vs 34.1%, $P = .018$) and were transferred from outside hospitals (32.1% vs 38.2%, $P = .011$). More cases experienced alcohol (4.6% vs 2.4%, $P = .017$) and substance use disorders (1.4% vs 4.4%, $P = .029$). Fewer cases had subdural hemorrhages (11.8% vs 16.4%, $P = .007$), and more had pneumothoraxes (3.5% vs 1.8%, $P = .032$). More patients admitted during COVID-19 experienced acute respiratory failure (2.0% vs 0.0%, $P < .001$), hypoxia (1.5% vs 3.3%, $P = .005$), and delirium (6.3% vs 1.0%, $P < .001$). Fewer cases were discharged to skilled nursing facilities (50.8% vs 57.3%, $P = .009$) and more to home with services (13.1% vs 8.3%, $P = .002$).

DISCUSSION: This study suggested there was a similar frequency of presentation for falls among older adults during the two study periods. Older adults with fall-related injuries experienced differences in presenting comorbidities, injury patterns, complications, and discharge locations during the study periods.

Language: en

Keywords

elderly; trauma; older adults; Kansas; COVID-19; falls

Ground level falls: computed tomography findings and clinical outcomes by age groups

Parlak S, Çıvgın E, Beşler MS, Gündoğdu S. Ulus. Travma Acil Cerrahi Derg. 2023; 29(6): 710-716.

(Copyright © 2023, Ulusal Travma ve Acil Cerrahi Derneği)

DOI 10.14744/tjtes.2023.28741 PMID 37278076

Abstract

BACKGROUND: This study aimed to determine injury patterns in ground level falls (GLFs) and investigate the effect of age on the severity of injury.

METHODS: We retrospectively identified 4,712 patients who presented to a Level 1 trauma center due to GLFs and analyzed the data of 1,214 patients who underwent computed tomography (CT). Demographics, torso examination findings, and injuries detected on CT were recorded. To investigate the effect of age on injury severity, the patients were grouped as those aged <65 and ≥65 years.

RESULTS: The mean age was 57 years, and 55.20% of the patients were female. The mortality rate was 0.50%. Injury was detected in 489 (40.30%) patients on CT. Fractures were the most common injury type. Traumatic intracranial hemorrhage was detected in 32 (2.60%) patients. Only three (0.20%) of the 63 patients with rib fractures had concomitant lung injury. The negative predictive value of the physical examination (PE) was 95.80% for chest injury. Intra-abdominal injury was not detected in any of the 116 patients who underwent abdominal CT. Hospitalization was also higher in the ≥65-year group ($p<0.001$). All mortalities ($n=6$) were seen in patients aged ≥65 years.

CONCLUSION: Our results indicate that GLFs cause more injuries in the elderly, resulting in more hospitalizations and mortality. Normal PE findings may reduce the need for whole-body CT in GLF patients who are conscious, cooperative, and oriented.

Language: en

Keywords

Aged; Humans; Female; Male; Middle Aged; Injury Severity Score; Retrospective Studies; Tomography, X-Ray Computed; *Rib Fractures; *Thoracic Injuries/complications

Leisure sedentary time is associated with self-reported falls in middle-aged and older females and males: an analysis of the CLSA

Lustosa LG, Rudoler D, Theou O, Dogra S. Can. Geriatr. J. 2023; 26(2): 239-246.

(Copyright © 2023, Canadian Geriatrics Society)

DOI 10.5770/cgj.26.636 PMID 37265982

Abstract

AIM: The purpose of this analysis was to report the prevalence of falls and falls-related injuries among those reporting different volumes of weekly sedentary time, and to understand the association of sedentary time and falls, accounting for functional fitness.

METHODS: Baseline and first follow-up data from the Canadian Longitudinal Study on Aging (CSLA) were analyzed (n=22,942). Participants self-reported whether they had a fall in the past 12 months (at baseline) and whether they had an injury that was a result of a fall (follow-up). In-home interviews collected self-reported leisure sedentary time using the Physical Activity Scale for Elderly. Functional fitness was assessed using grip strength, timed-up-and-go, and chair rise tests during clinic visits.

RESULTS: The prevalence of falls was higher among those who reported higher sedentary time. For example, among males aged 65 and older who reported lower sedentary time (<1,080 min/week), the prevalence of falls in the past 12 months (at baseline) was 7.8% compared to 9.8% in those reporting higher sedentary time. The odds of reporting a fall (at baseline) was 21% higher in those who reported higher sedentary time (OR: 1.21; 95%CI: 1.11-1.33) in adjusted models. No associations were found between sedentary time and injuries due to a fall.

CONCLUSIONS: Reporting high volumes of sedentary time may increase the risk of falls. Future research using device-based estimates of total sedentary time and breaks in sedentary time is needed to further elucidate this association.

Language: en

Keywords

aging; sedentary behaviour; CLSA; functional fitness; sitting

Pragmatic multicentre stepped-wedge cluster randomised trial to investigate the effectiveness of community-based falls prevention programme for older adults with falls risk in Singapore: a protocol paper

Tan PJ, Ginting ML, Lim ZZB, Balachandar N, Sultana R, Kadir MM, Xu T, Ismail NH, Yap JKY, Wong SF, Yoong J, Matchar DB, Hill K, Wong CH. *BMJ Open* 2023; 13(6): e072029.

(Copyright © 2023, BMJ Publishing Group)

DOI 10.1136/bmjopen-2023-072029 **PMID** 37263684

Abstract

INTRODUCTION: Falls are an important public health issue with consequences that include injuries, quality of life reduction and high healthcare costs. Studies show that falls prevention strategies are effective in reducing falls rate among community-dwelling older adults. However, the evaluation for effectiveness was usually done in a controlled setting with homogeneous population, and thus may not be generalisable to a wider population. This study aims to evaluate the impact of community falls prevention programmes with group-based strength and balance exercises, on falls risk and health outcomes for older adults with falls risk in Singapore.

METHODS AND ANALYSIS: This is a pragmatic closed cohort stepped-wedge cluster randomised trial design study, which involves sequential crossover of clusters from the waitlist control condition to the intervention condition, with the sequence of crossover randomly determined. The intervention will be sequentially rolled out to 12 clusters (a minimum of 5 participants/cluster), over 6 time periods with 8-week intervals in Central and North regions of Singapore. The primary analysis will be conducted under the intention-to-treat principle. A general linear mixed model or generalised estimating equation analysis appropriate for a multilevel longitudinal study incorporating an appropriate error distribution and link function will be used. Markov model will be developed to estimate the incremental cost per quality-adjusted life years and incremental cost per fall prevented from the implementation of falls prevention strategies from a societal perspective. Conditional on there being clinically relevant differences in short-term outcomes, we will implement simulation modelling to project the long-term divergence in trajectories for outcomes and costs using the Markov model. **ETHICS AND DISSEMINATION:** Ethics approval has been obtained.

RESULTS will be disseminated in publications and other relevant platforms. **TRIAL REGISTRATION NUMBER:** NCT04788251.

Language: en

Keywords

public health; geriatric medicine; health services administration & management

Single and combined use of fall-risk-increasing drugs and fracture risk: a population-based case-control study

Hauff J, Rottenkolber M, Oehler P, Fischer S, Gensichen J, Drey M, Alexander GC, Guthrie B, Dreischulte T. Age Ageing 2023; 52(6): afad079.

(Copyright © 2023, Oxford University Press)

DOI 10.1093/ageing/afad079 PMID 37261447

Abstract

BACKGROUND: while many drug groups are associated with falls in older people, less is known about absolute increases in risk and how these risks vary across different groups of drugs or individuals.

METHOD AND DESIGN: we conducted a population based nested case-control study among people aged ≥ 65 years in the Scottish regions of Tayside and Fife. Cases were individuals hospitalised with a fracture between 2010 and 2020, to whom we matched up to 10 controls. We examined relative and absolute risks of drug groups known as 'Fall-Risk-Increasing Drugs' (FRIDs), alone and in combination, and among younger and older (≥ 75 years) adults. Adjusting for previous hospitalisations, drug use and laboratory data, we used conditional logistic regression to quantify associations between drug exposures and outcomes. We conducted four sensitivity analyses to test the robustness of our findings.

RESULTS: the cohort comprised 246,535 people aged ≥ 65 years, of whom 18,456 suffered an incident fracture. Fracture risks were significantly increased for most FRIDs examined. Absolute risks were much larger among older vs younger people and both relative and absolute risks increased with the number of FRIDs combined. Overall, the highest absolute increase in risk were found in people aged ≥ 75 years for selective serotonin reuptake inhibitors (number needed to harm 53), tricyclic antidepressants (NNH 81), antipsychotics (NNH 75) and use of three or more FRIDs (NNH ≤ 66).

CONCLUSION: patients aged ≥ 75 years prescribed antidepressants or antipsychotics or taking three or more drugs that increase risk of falls may benefit most from deprescribing interventions.

Language: en

Keywords

falls; older people; adverse drug events; fall-risk-increasing drugs; fractures

Stability changes in fall-prone individuals with Parkinson disease following reactive step training

Monaghan AS, Hooyman A, Dibble LE, Mehta SH, Peterson DS. J. Neurol. Phys. Ther. 2023; ePub(ePub): ePub.

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DOI 10.1097/NPT.0000000000000442 PMID 37259190

Abstract

BACKGROUND AND PURPOSE: Poor reactive steps may lead to falls in people with Parkinson disease (PwPD). However, whether reactive steps can be improved in PwPD at risk for falls or whether step training reduces falls remains unclear. This study aimed to determine whether 2 weeks of reactive step training result in (1) immediate and retained improvements in stepping and (2) fewer prospective falls in PwPD at fall risk.

METHODS: Twenty-five PwPD (70.52 years \pm 7.15; Hoehn & Yahr range 1-3) at risk for falls completed a multiple baseline, open-label, uncontrolled pre-/postintervention study. Stepping performance was assessed at 2 baseline assessments (B1 and B2) followed by a 2-week, 6-session training protocol. Stepping was assessed immediately (P1) and 2 months after training (P2). Primary outcomes were anterior-posterior margin of stability (MOS), step length, and step latency during backward stepping. Fall frequency was measured for 2 months before and after training.

RESULTS: MOS during backward steps was significantly larger (better) after training ($P < 0.001$, $d = 0.83$), and improvements were retained for 2 months ($P = 0.04$, $d = 0.66$). Step length was not statistically significant different after training ($P = 0.13$, $d = 0.46$) or at follow-up ($P = 0.08$, $d = 0.62$), although effect sizes were medium and large, respectively. Step latency improved after initial exposure ($P = 0.01$, $d = 0.60$) but not following training ($P = 0.43$, $d = 0.35$). Twelve participants experienced fewer falls after training than before (10 = no change, 5 = increase; $P = 0.12$). Greater improvements in MOS were related to fewer falls ($P = 0.04$).

DISCUSSION AND CONCLUSIONS: Two weeks of reactive step training resulted in immediate and retained improvements in some reactive stepping outcomes in PwPD at risk for falls and may reduce fall risk. Reactive step training may be a viable approach to reduce falls in PwPD.

Language: en

The clinical effectiveness of a falls rapid response service, and sex differences of patients using the service: a cross-sectional study in an English ambulance trust

Charlton K, Stagg H, Burrow E. Br. Paramed. J. 2023; 8(1): 28-33.

(Copyright © 2023, College of Paramedics)

DOI 10.29045/14784726.2023.6.8.1.28 PMID 37284609

Abstract

BACKGROUND: Falls in older adults are an important issue internationally. They occur from complex interactions between biological, environmental and activity-related factors. As the sexes age differently, there may be sex differences regarding falls. This study aimed to determine the clinical effectiveness of a falls rapid response service (FRRS) in an English ambulance trust and to identify sex differences between patients using the service.

METHODS: A cross-sectional study between December 2018 and September 2020. Patients aged ≥ 60 years who had fallen within the study area were included. The FRRS comprised a paramedic and occupational therapist and responded 07:00-19:00, 7 days per week. Anonymised data regarding age, sex and conveyance were collected for all patients attended by the FRRS and standard ambulance crews. Clinical data regarding fall events were collected from consenting patients attended by the FRRS only.

RESULTS: There were 1091 patients attended by the FRRS versus 4269 by standard ambulance crews. Patient characteristics were similar regarding age and sex. The FRRS consistently conveyed fewer patients versus standard ambulance crews (467/1091 (42.8%) v. 3294/4269 (77.1%), $p < 0.01$). Clinical data were collected from 426/1091 patients attended by the FRRS. In these patients, women were more likely to reside alone than men (181/259 (69.8%) v. 86/167 (51.4%), $p < 0.01$), and less likely to experience a witnessed fall (16.2% v. 26.3%, $p = 0.01$). Women had a higher degree of comorbidity specific to osteoarthritis and osteoporosis, while men were more likely to report a fear of falling score of 0 (35.3% v. 22.7%, $p < 0.01$).

CONCLUSION: The FRRS is clinically effective regarding falls compared to standard ambulance crews. Sex differences existed between men and women using the FRRS, indicating women are further along the falls trajectory than men. Future research should focus on demonstrating the cost effectiveness of the FRRS and how to better meet the needs of older women who fall.

Language: en

Keywords

older adults; accidental falls; sex; emergency paramedic

The effect of a standing intervention on falls in long term care: a secondary analysis of a randomized controlled trial

Gallibois M, Handrigan G, Caissie L, Cooling K, Hebert J, Jarrett P, McGibbon C, Read E, Sénéchal M, Bouchard DR. Can. Geriatr. J. 2023; 26(2): 247-252.

(Copyright © 2023, Canadian Geriatrics Society)

DOI 10.5770/cgj.26.656 **PMID** 37265979

Abstract

BACKGROUND: Older adults in long term care (LTC) spend over 90% of their day engaging in sedentary behaviour. Sedentary behaviour may exacerbate functional decline and frailty, increasing the risk for falls. The purpose of this study is to explore the impact of a 22-week standing intervention on falls among LTC residents at 12-month follow-up.

METHODS: This was a planned secondary analysis of the Stand if You Can randomized controlled trial. The original trial randomized 95 participants (n = 47 control; n = 48 intervention) to either a sitting control or a supervised standing intervention group (100 minutes/week) for 22 weeks. Falls data were available to be collected over 12 months post-intervention for 89 participants. The primary outcome was a hazard of fall (Yes/No) during the 12-month follow-up period.

RESULTS: A total of 89 participants (average age 86 years \pm 8.05; 71.9% female) were followed for 12-months post-intervention. Participants in the intervention group (n=44) had a significantly greater hazard ratio of falls (2.01; 95% CI = 1.11 to 3.63) than the control group (n=45) when accounting for the history of falls, frailty status, cognition level, and sex.

CONCLUSION: Participants who received a standing intervention over 22 weeks were twice as likely to fall 12 months after the intervention compared with the control group. However, the prevalence of falls did not surpass what would be typically observed in LTC facilities. It is imperative that future studies describe in detail the context in which falls happen and collect more characteristics of participants in the follow-up period to truly understand the association between standing more and the risk of falls.

Language: en

Keywords

frailty; falls; clinical trial; sedentary behaviour

The effect of an exercise-based rehabilitation programme in functional recovery and prevention of secondary falls after a hip fracture in older adults: a systematic review

Pantouvaki A, Patelarou E, Kastanis G, Alpantaki K, Sfakianakis MZ. J. Frailty Sarcopenia Falls 2023; 8(2): 118-126.

(Copyright © 2023, Hylonome Publications)

DOI 10.22540/JFSF-08-118 **PMID** 37275657

Abstract

We performed a systematic review to evaluate whether an exercise-based intervention programme, for older people with a hip fracture, is effective in functional recovery and in preventing secondary fall-related injuries. This systematic review was conducted according to Cochrane review guidelines and based on the PRISMA statement. Six electronic databases (Medline, PubMed, Cochrane Library, CIHNAL, Embase, Google Scholar) from 2010 to 31 December 2021 were searched for randomised controlled trials (RCTs) of functional recovery or fall prevention exercises after a hip fracture surgery in older people (≥ 65 years). Thirty-four references were identified initially, however, only 8 studies (1617 patients) met the eligibility criteria. Despite the heterogeneity of the onset, duration and of the characteristics of exercise-based intervention, as well as the type of setting it was delivered in, there was evidence that an exercise-based rehabilitation programme improved physical function and gait ability. There was no evidence about preventing a secondary fall after a hip fracture. In conclusion, an exercise-based intervention programme can generally improve functional recovery after a hip fracture. It remains uncertain if it affects the prevention of a secondary fall over a 1-year follow-up period

Language: en

Keywords

Review; Exercise; Fall prevention; Functional outcome; Hip fracture

The movement deviation profile can differentiate faller and non-faller older adults

Júlio CE, Antonialli FC, Nascimento TM, Sá KA, Barton GJ, Lucareli PRG. J. Gerontol. A Biol. Sci. Med. Sci. 2023; ePub(ePub): ePub.

(Copyright © 2023, Gerontological Society of America)

DOI 10.1093/gerona/glad141 **PMID** 37279546

Abstract

BACKGROUND: The World Health Organization considers falls the second leading cause of death by accidental injury worldwide and one of the most frequent complications in older adults during activities of daily living. Several tasks related to fall risk have been individually assessed describing kinematic changes in older adults. The study proposal was identify which functional task differentiates faller and non-faller older adults using the movement deviation profile (MDP).

METHODS: This cross-sectional study recruited 68 older adults aged ≥ 60 years by convenience sampling. Older adults were divided into two groups: with and without a history of falls (34 older adults in each group). The MDP analyzed the three-dimensional angular kinematics data of tasks (i.e., gait, walking turn, stair ascent and descent, sit-to-stand, and stand-to-sit), and the Z-score of the mean MDP identified which task presented the greatest difference between fallers and non-fallers. A multivariate analysis (MANOVA) with Bonferroni post hoc verified the interaction between groups considering angular kinematic data and the cycle time of the task. Statistical significance was set at 5% ($p < 0.05$).

RESULTS: Z-score of the MDPmean showed an interaction between groups ($\lambda = 0.67$, $F = 5.085$, $p < 0.0001$). Fallers differed significantly from non-fallers in all tasks and the greatest difference was in stair descent (Z-Score = 0.89). The time to complete each task was not different between groups.

CONCLUSION: The MDP distinguished older adult fallers from non-fallers. The stair descent task should be highlighted since it presented the greatest difference between groups.

Language: en

Keywords

3D joint kinematics; Biomechanical phenomena; Fall accidents; Movement Deviation Profile

Use of dual-task timed-up-and-go tests for predicting falls in physically active, community-dwelling older adults-a prospective study

Tong Y, Rong J, Tian X, Wang Y, Chen Z, Adams R, Witchalls J, Waddington G, El-Ansary D, Wu S, Tirosh O, Wu T, Han J. J. Aging Phys. Act. 2023; ePub(ePub): ePub.

(Copyright © 2023, Human Kinetics Publishers)

DOI 10.1123/japa.2022-0341 **PMID** 37263592

Abstract

This prospective study aimed to determine which specific mobility tests were the most accurate for predicting falls in physically active older adults living in the community. Seventy-nine physically active older adults who met the American College of Sports Medicine physical activity guidelines volunteered. Participants were assessed and followed up for 12 months. Mobility assessments included the 30-s sit-to-stand test, five times sit-to-stand test, single-task timed-up-and-go test (TUG), motor dual-task TUG (Mot-TUG), and cognitive dual-task TUG (Cog-TUG). Mot-TUG and Cog-TUG performances were moderately correlated with number of falls ($r = .359$, $p < .01$ and $r = .372$, $p < .01$, respectively). When Mot-TUG, Cog-TUG, or Age were included as fall predictors, discrimination scores represented by the area under the receiver operating characteristic curve (AUC) were AUC (Mot-TUG) = 0.843 ($p < .01$), AUC (Cog-TUG) = 0.856 ($p < .01$), and AUC (Age) = 0.734 ($p < .05$). The cutoff point for Cog-TUG was 10.98 s, with test sensitivity of 1.00 and specificity of 0.66. Fall predictors for different populations may be based on different test methods. Here, the dual-task TUG test more accurately predicted falls in older adults who met American College of Sports Medicine's physical activity guidelines.

Language: en

Keywords

aging; balance; mobility; postural control

Validation of the ADFICE_IT models for predicting falls and recurrent falls in geriatric outpatients

van de Loo B, Heymans MW, Medlock S, Boyé NDA, van der Cammen TJM, Hartholt KA, Emmelot-Vonk MH, Mattace-Raso FUS, Abu-Hanna A, van der Velde N, van Schoor NM. J. Am. Med. Dir. Assoc. 2023; ePub(ePub): ePub.

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DOI 10.1016/j.jamda.2023.04.021 **PMID** 37268014

Abstract

OBJECTIVES: Before being used in clinical practice, a prediction model should be tested in patients whose data were not used in model development. Previously, we developed the ADFICE_IT models for predicting any fall and recurrent falls, referred as Any_fall and Recur_fall. In this study, we externally validated the models and compared their clinical value to a practical screening strategy where patients are screened for falls history alone.

DESIGN: Retrospective, combined analysis of 2 prospective cohorts. **SETTING AND PARTICIPANTS:** Data were included of 1125 patients (aged ≥ 65 years) who visited the geriatrics department or the emergency department.

METHODS: We evaluated the models' discrimination using the C-statistic. Models were updated using logistic regression if calibration intercept or slope values deviated significantly from their ideal values. Decision curve analysis was applied to compare the models' clinical value (ie, net benefit) against that of falls history for different decision thresholds.

RESULTS: During the 1-year follow-up, 428 participants (42.7%) endured 1 or more falls, and 224 participants (23.1%) endured a recurrent fall (≥ 2 falls). C-statistic values were 0.66 (95% CI 0.63-0.69) and 0.69 (95% CI 0.65-0.72) for the Any_fall and Recur_fall models, respectively. Any_fall overestimated the fall risk and we therefore updated only its intercept whereas Recur_fall showed good calibration and required no update. Compared with falls history, Any_fall and Recur_fall showed greater net benefit for decision thresholds of 35% to 60% and 15% to 45%, respectively.

CONCLUSIONS AND IMPLICATIONS: The models performed similarly in this data set of geriatric outpatients as in the development sample. This suggests that fall-risk assessment tools that were developed in community-dwelling older adults may perform well in geriatric outpatients. We found that in geriatric outpatients the models have greater clinical value across a wide range of decision thresholds compared with screening for falls history alone.

Language: en

Keywords

Accidental falls; Prognosis; decision curve analysis; Individual participant data

Fall risk in adult family practice non-attenders: a cross-sectional study from Slovenia

Ružić-Gorenjec N, Klemenc Ketiš Z, Blagus R, Poplas Susič A. Zdr. Varst. 2023; 62(2): 76-86.

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DOI 10.2478/sjph-2023-0011 PMID 37266067

Abstract

INTRODUCTION: Not much is known about the fall risk among the adult population of those who rarely visit doctors. We wanted to determine the prevalence of increased fall risk in a population of family practice non-attenders and the factors associated with it.

METHODS: We included participants from family medicine practices in this cross-sectional study. To be included in the study, the participants had to be adults living in the community (home-dwelling people) who had not visited their chosen family physician in the last five years (non-attenders). The identification of the eligible persons was done through a search of electronic medical records, which yield 2,025 non-attenders. Community nurses collected data in the participants' homes. The outcome measure was increased fall risk as assessed by the Morse fall scale: increased risk (≥ 25) vs. no risk.

RESULTS: The sample consisted of 1,945 patients (96.0% response rate) with a mean age of 60.4 years (range 20.5 to 99.7 years). An increased fall risk was determined in 482 or 24.8% (95% CI: [22.9, 26.8]) of the patients. The multivariate model showed a significant association of increased fall risk with higher age ($p < 0.001$), lower systolic blood pressure ($p = 0.047$), poor family function ($p = 0.016$), increased risk of malnutrition ($p = 0.013$), higher number of chronic diseases ($p = 0.027$), higher pain intensity ($p < 0.001$), lower self-assessment of current health ($p = 0.002$), and higher dependence in daily activities ($p < 0.001$).

CONCLUSION: Non-attenders may have an increased risk of falling which depends on their health status and age. The inclusion of community nurses in primary healthcare teams could be of use not only to identify the non-attenders' health needs, but also to better manage their health, especially the factors that were identified to be associated with greater fall risk.

Language: en

Keywords

Fall risk; Cross-sectional studies; Family practice; Non-attenders; Primary healthcare

Longitudinal associations of objectively measured physical activity and sedentary time with leg muscle strength, balance and falls in middle-aged women

Wang MMMS, Wu FPD, Callisaya MLPD, Jones GPD, Winzenberg TMPD. Eur. J. Sport Sci. 2023; ePub(ePub): ePub.

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DOI 10.1080/17461391.2023.2222096 PMID 37272369

Abstract

PURPOSE: We examined the longitudinal associations of accelerometer-measured physical activity and sedentary time with leg muscle strength (LMS), balance, and falls in middle-aged women.

METHODS: This was a five-year prospective cohort study among 308 women aged 36-56 years. We used linear mixed-effects models to examine associations of baseline and change in accelerometer-measured sedentary time, light physical activity (LPA) and moderate-to-vigorous physical activity (MVPA) with baseline and five-year change in LMS and balance (timed up and go test [TUG], functional reach test [FRT], lateral reach test [LRT], and step test [ST]), and negative binomial/Poisson and log-binomial regression as appropriate to assess associations with falls after five-year follow-up.

RESULTS: In adjusted models, greater baseline MVPA was associated with better baseline LMS ($\beta=4.65$ kg/SD, 95% CI: 1.37, 7.93) and TUG ($\beta=-0.09$ second/SD, 95% CI: -0.18, -0.01) but not with change in them over five years. Baseline MVPA was not associated with FRT at baseline but associated with a greater decrease in FRT ($\beta=-0.87$ cm/SD, 95% CI: -1.57, -0.17). Increased MVPA over 5 years was associated with less deterioration in FRT ($\beta=0.88$ cm/SD, 95% CI: 0.14, 1.61). Increased sedentary time over 5 years was associated with a larger decrease in FRT ($\beta=-0.82$ cm/SD, 95% CI: -1.58, -0.07). Higher baseline LPA was associated with higher falls risk (IRR=1.27, 95% CI: 1.02, 1.57).

CONCLUSIONS: Higher baseline MVPA may benefit LMS and balance, while increasing MVPA in the medium term has little effect on change in these outcomes in mid-life.

Detrimental association of LPA with falls may be due to greater exposures to environmental hazards.

HIGHLIGHTS: Our study for the first time examined the longitudinal associations of objectively measured physical activity and sedentary time with leg muscle strength, balance and falls in middle-aged women. Higher baseline moderate-to-vigorous physical activity (MVPA) may be beneficial for muscle strength and balance at baseline but increasing MVPA in the medium term has little effect on change in LMS or balance outcomes in middle-aged women. Higher baseline light physical activity (LPA) was associated with an increased risk of falls. The detrimental association of LPA with falls may be due to a greater exposure to environmental hazards in midlife, which needs to be clarified in future research.

Language: en

Keywords: risk factors; physical activity; Accidental falls; functional mobility; middle age