

Safety Literature 19th March 2023

Assessing the contributions of modifiable risk factors to serious falls and fragility fractures among older persons living with HIV

Womack JA, Murphy TE, Leo-Summers L, Bates J, Jarad S, Gill TM, Hsieh E, Rodriguez-Barradas MC, Tien PC, Yin MT, Brandt CA, Justice AC. J. Am. Geriatr. Soc. 2023; ePub(ePub): ePub.

(Copyright © 2023, John Wiley and Sons)

DOI 10.1111/jgs.18304 PMID 36912153

Abstract

BACKGROUND: Although 50 years represents middle age among uninfected individuals, studies have shown that persons living with HIV (PWH) begin to demonstrate elevated risk for serious falls and fragility fractures in the sixth decade; the proportions of these outcomes attributable to modifiable factors are unknown.

METHODS: We analyzed 21,041 older PWH on antiretroviral therapy (ART) from the Veterans Aging Cohort Study from 01/01/2010 through 09/30/2015. Serious falls were identified by Ecodes and a machine-learning algorithm applied to radiology reports. Fragility fractures (hip, vertebral, and upper arm) were identified using ICD9 codes. Predictors for both models included a serious fall within the past 12 months, body mass index, physiologic frailty (VACS Index 2.0), illicit substance and alcohol use disorders, and measures of multimorbidity and polypharmacy. We separately fit multivariable logistic models to each outcome using generalized estimating equations. From these models, the longitudinal extensions of average attributable fraction (LE-AAF) for modifiable risk factors were estimated.

RESULTS: Key risk factors for both outcomes included physiologic frailty (VACS Index 2.0) (serious falls [15%; 95% CI 14%-15%]; fractures [13%; 95% CI 12%-14%]), a serious fall in the past year (serious falls [7%; 95% CI 7%-7%]; fractures [5%; 95% CI 4%-5%]), polypharmacy (serious falls [5%; 95% CI 4%-5%]; fractures [5%; 95% CI 4%-5%]), an opioid prescription in the past month (serious falls [7%; 95% CI 6%-7%]; fractures [9%; 95% CI 8%-9%]), and diagnosis of alcohol use disorder (serious falls [4%; 95% CI 4%-5%]; fractures [8%; 95% CI 7%-8%]).

CONCLUSIONS: This study confirms the contributions of risk factors important in the general population to both serious falls and fragility fractures among older PWH. Successful prevention programs for these outcomes should build on existing prevention efforts while including risk factors specific to PWH.

Language: en

Keywords

falls; HIV; fragility fractures; LE-AAF

Association between sarcopenia, falls, and cognitive impairment in older people: a systematic review with meta-analysis

Fhon JRS, Silva ARF, Lima EFC, Santos Neto APD, Henao-Castaño M, Fajardo-Ramos E, Püschel VAA. *Int. J. Environ. Res. Public Health* 2023; 20(5): e4156.

(Copyright © 2023, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ijerph20054156 **PMID** 36901167

Abstract

With the aging process, elderly people present changes in their bodies that can lead them to suffer several geriatric syndromes. The present study aimed to analyze and synthesize the literature produced concerning the association of sarcopenia with falls in elderly people with cognitive impairment. This is a systematic review study on etiology and risk, conducted according to the JBI methodology using the Medline (Pubmed), Cinahl, Embase, Scopus, and Web of Science databases. The gray literature search was conducted in the CAPES Brazilian Digital Library of Theses and Dissertations, Google Scholar, Networked Digital Library of Theses and Dissertations (NDLTD), EBSCO Open Dissertations, DART-e, and ACS Guide to Scholarly Communication. The identification of the association between the variables was extracted from the articles themselves (Odds Ratio and the 95% Confidence Intervals). Four articles published between 2012 and 2021 were included in this review. A prevalence of falls was identified, ranging from 14.2% to 23.1%, of cognitive impairment ranging from 24.1% to 60.8%, and of sarcopenia ranging from 6.1 to 26.6%. The meta-analysis found that elderly people with cognitive impairment who suffer falls are at a 1.88 times greater risk of presenting sarcopenia ($p = 0.01$). There is evidence of an association between the variables, but it is necessary to conduct follow-up studies to support this association as well as other factors that may influence the senescence and senility process.

Language: en

Keywords

elderly; falls; review; cognitive dysfunction; sarcopenia

Cause-specific mortality among adults aged ≥ 65 years in the United States, 1999 through 2020

Kakara RS, Lee R, Eckstrom EN. Public Health Rep. (1974) 2023; ePub(ePub): ePub.

(Copyright © 2023, Association of Schools of Public Health)

DOI 10.1177/00333549231155869 **PMID** 36905313

Abstract

OBJECTIVE: Reports on recent mortality trends among adults aged ≥ 65 years are lacking. We examined trends in the leading causes of death from 1999 through 2020 among US adults aged ≥ 65 years.

METHODS: We used data from the National Vital Statistics System mortality files to identify the 10 leading causes of death among adults aged ≥ 65 years. We calculated overall and cause-specific age-adjusted death rates and then calculated the average annual percentage change (AAPC) in death rates from 1999 through 2020.

RESULTS: The overall age-adjusted death rate decreased on average by 0.5% (95% CI, -1.0% to -0.1%) per year from 1999 through 2020. Although rates for 7 of the top 10 causes of death decreased significantly, the rates of death from Alzheimer disease (AAPC = 3.0%; 95% CI, 1.5% to 4.5%) and from unintentional injuries (AAPC = 1.2%; 95% CI, 1.0% to 1.4%), notably falls (AAPC = 4.1%; 95% CI, 3.9% to 4.3%) and poisoning (AAPC = 6.6%; 95% CI, 6.0% to 7.2%), increased significantly.

CONCLUSION: Public health prevention strategies and improved chronic disease management may have contributed to decreased rates in the leading causes of death. However, longer survival with comorbidities may have contributed to increased rates of death from Alzheimer disease and unintentional falls.

Language: en

Keywords

aged; accidental falls; Alzheimer disease; death trends; leading causes

Cervical spine injuries in adults ≥ 65 years after low-level falls - a systematic review and meta-analysis

McCallum J, Eagles D, Ouyang Y, Ende JV, Vaillancourt C, Fehlmann C, Shorr R, Taljaard M, Stiell I. Am. J. Emerg. Med. 2023; 67: 144-155.

(Copyright © 2023, Elsevier Publishing)

DOI 10.1016/j.ajem.2023.02.008 **PMID** 36893628

Abstract

BACKGROUND: Adults ≥ 65 are at risk of cervical spine (C-spine) injury, even after low-level falls. The objectives of this systematic review were to determine the prevalence of C-spine injury in this population and explore the association of unreliable clinical exam with C-spine injury.

METHODS: We conducted this systematic review according to PRISMA guidelines. We searched MEDLINE, PubMed, EMBASE, Scopus, Web of Science, and the Cochrane Database of Systematic reviews to include studies reporting on C-spine injury in adults ≥ 65 years after low-level falls. Two reviewers independently screened articles, abstracted data, and assessed bias. Discrepancies were resolved by a third reviewer. A meta-analysis was performed to estimate overall prevalence and the pooled odds ratio for the association between C-spine injury and an unreliable clinical exam.

RESULTS: The search identified 2044 citations, 138 full texts were screened, and 21 studies were included in the systematic review. C-spine injury prevalence in adults ≥ 65 years after low-level falls was 3.8% (95% CI: 2.8-5.3). The odds of c-spine injury in those with altered level of consciousness (aLOC) v/s not aLOC was 1.21 (0.90-1.63) and in those with GCS < 15 v/s GCS 15 was 1.62 (0.37-6.98). Studies were at a low-risk of bias, although some had low recruitment and significant loss to follow-up.

CONCLUSIONS: Adults ≥ 65 years are at risk of cervical spine injury after low-level falls. More research is needed to determine whether there is an association between cervical spine injury and GCS < 15 or altered level of consciousness.

Language: en

Keywords

Aged; Falls; Diagnostic imaging; Spinal fractures

Comparing the effects of two perturbation-based balance training paradigms in fall-prone older adults: a randomized controlled trial

Brüll L, Hezel N, Arampatzis A, Schwenk M. Gerontology 2023; ePub(ePub): ePub.

(Copyright © 2023, Karger Publishers)

DOI 10.1159/000530167 PMID 36921581

Abstract

Introduction There is increasing evidence that perturbation-based balance training (PBT) is highly effective in preventing falls at older age. Different PBT paradigms have been presented so far, yet a systematic comparison of PBT approaches with respect to feasibility and effectiveness is missing. Two different paradigms of PBT seem to be promising for clinical implementation: 1. Technology-supported training on a perturbation treadmill (PBTtreadmill); 2. Training of dynamic stability mechanisms in the presence of perturbations induced by unstable surfaces (PBTstability). This study aimed to compare both program's feasibility and effectiveness in fall-prone older adults.

METHODS In this three-armed randomized controlled trial, seventy-one older adults (74.9 ± 6.0 years) with a verified fall risk were randomly assigned into three groups: PBTtreadmill on a motorized treadmill, PBTstability using unstable conditions such as balance pads and a passive control group (CG). In both intervention groups, participants conducted a 6-weeks intervention with 3 sessions per week. Effects were assessed in fall risk (Brief-BEST), balance ability (Stepping Threshold Test, Center of Pressure, Limits of Stability), leg strength capacity, functional performance (Timed Up and Go Test, Chair-Stand), gait (preferred walking speed) and fear of falling (Short-FES-I).

RESULTS Fifty-one participants completed the study. Training adherence was 91% for PBTtreadmill and 87% for PBTstability, while no severe adverse events occurred. An ANCOVA with an intention-to-treat approach revealed statistically significant group effects in favor of PBTstability in the Brief-BEST ($p=.009$, $\eta^2=.131$) and the Limits of Stability ($p=.020$, $\eta^2=.110$), and in favor of PBTtreadmill in the Stepping Threshold Test ($p<.001$, $\eta^2=.395$). The other outcomes demonstrated no significant group effects.

DISCUSSION/Conclusion Both training paradigms demonstrated high feasibility and were effective in improving specific motor performances in the fall-prone population and these effects were task-specific. PBTtreadmill showed higher improvements in reactive balance, which might have been promoted by the unpredictable nature of the included perturbations and the similarity to the tested surface perturbation paradigm. PBTstability showed more wide-ranging effects on balance ability. Consequently, both paradigms improved fall-risk-associated measures. The advantages of both formats should be evaluated in the light of individual needs and preferences. Larger studies are needed to investigate the effects of these paradigms on real-life fall rates.

Language: en

Compliance prediction of a novel head protection device for elderly patients with fall risk

Kepros JP, Haag S, Patterson S. Am. Surg. 2023; ePub(ePub): ePub.

(Copyright © 2023, Southeastern Surgical Congress)

DOI 10.1177/00031348231161718 **PMID** 36899488

Abstract

Brain injury from ground level falls (GLF) is common and has substantial morbidity. We identified a potential head protection device (HPD). This report describes predicted future compliance. 21 elderly patients were provided a HPD and were evaluated on admission and after discharge. Compliance, ease of use, and comfort were evaluated. Differences between categorical variables (gender, race, age group1, 55-77 years; group2, 78+) and compliance were tested using the chi-squared statistic. HPD compliance at baseline was 90% with 85% at follow-up ($P = .33$). No difference with HPD interaction ($P = .72$), ease of use ($P = .57$), and comfort ($P = .77$). Weight was a concern on follow-up ($P = .001$). Age group1 was more compliant ($P = .05$). At two months, patients were compliant with no falls recorded. The identified HPD with modifications has a high predicted compliance in this population. After the device is modified, effectiveness will be assessed.

Language: en

Keywords

head injury; ground level falls; head protection device; patient compliance

Course of fear of falling after hip fracture: findings from a 12-month inception cohort

Scheffers-Barnhoorn MN, Haaksma ML, Achterberg WP, Niggebrugge AH, van der Sijp MP, van Haastregt JC, van Eijk M. BMJ Open 2023; 13(3): e068625.

(Copyright © 2023, BMJ Publishing Group)

DOI 10.1136/bmjopen-2022-068625 **PMID** 36918243

Abstract

OBJECTIVES: To examine the course of fear of falling (FoF) up to 1 year after hip fracture, including the effect of prefracture FoF on the course.

DESIGN: Observational cohort study with assessment of FoF at 6, 12 and 52 weeks after hip fracture. **SETTING:** Haaglanden Medical Centre, the Netherlands. **PARTICIPANTS:** 444 community-dwelling adults aged 70 years and older, admitted to hospital with a hip fracture. **MAIN OUTCOME MEASURE:** Short Falls Efficacy Scale International (FES-I), with a cut-off score ≥ 11 to define elevated FoF levels.

RESULTS: Six weeks after hip fracture the study population-based mean FES-I was located around the cut-off value of 11, and levels decreased only marginally over time. One year after fracture almost one-third of the population had FoF (FES-I ≥ 11). Although the group with prefracture FoF (42.6%) had slightly elevated FES-I levels during the entire follow-up, the effect was not statistically significant. Patients with persistent FoF at 6 and 12 weeks after fracture (26.8%) had the highest FES-I levels, with a mean well above the cut-off value during the entire follow-up. For the majority of patients in this group, FoF is still present 1 year after fracture (84.9%).

CONCLUSIONS: In this study population, representing patients in relative good health condition that are able to attend the outpatient follow-up at 6 and 12 weeks, FoF as defined by an FES-I score ≥ 11 was common within the first year after hip fracture. Patients with persistent FoF at 12 weeks have the highest FES-I levels in the first year after fracture, and for most of these patients the FoF remains. For timely identification of patients who may benefit from intervention, we recommend structural assessment of FoF in the first 12 weeks after fracture.

Language: en

Keywords

Hip; GERIATRIC MEDICINE; REHABILITATION MEDICINE

Development and validation of the fall-related injury risk in nursing homes (INJURE-NH) prediction tool

Duprey MS, Zullo AR, Gouskova NA, Lee Y, Capuano A, Kiel DP, Daiello LA, Kim DH, Berry SD. *J. Am. Geriatr. Soc.* 2023; ePub(ePub): ePub.

(Copyright © 2023, John Wiley and Sons)

DOI 10.1111/jgs.18277 **PMID** 36883262

Abstract

BACKGROUND: Existing models to predict fall-related injuries (FRI) in nursing homes (NH) focus on hip fractures, yet hip fractures comprise less than half of all FRIs. We developed and validated a series of models to predict the absolute risk of FRIs in NH residents.

METHODS: Retrospective cohort study of long-stay US NH residents (≥ 100 days in the same facility) between January 1, 2016 and December 31, 2017 ($n = 733,427$) using Medicare claims and Minimum Data Set v3.0 clinical assessments. Predictors of FRIs were selected through LASSO logistic regression in a 2/3 random derivation sample and tested in a 1/3 validation sample. Sub-distribution hazard ratios (HR) and 95% confidence intervals (95% CI) were estimated for 6-month and 2-year follow-up. Discrimination was evaluated via C-statistic, and calibration compared the predicted rate of FRI to the observed rate. To develop a parsimonious clinical tool, we calculated a score using the five strongest predictors in the Fine-Gray model. Model performance was repeated in the validation sample.

RESULTS: Mean (Q1, Q3) age was 85.0 (77.5, 90.6) years and 69.6% were women. Within 2 years of follow-up, 43,976 (6.0%) residents experienced ≥ 1 FRI. Seventy predictors were included in the model. The discrimination of the 2-year prediction model was good (C-index = 0.70), and the calibration was excellent. Calibration and discrimination of the 6-month model were similar (C-index = 0.71). In the clinical tool to predict 2-year risk, the five characteristics included independence in activities of daily living (ADLs) (HR 2.27; 95% CI 2.14-2.41) and a history of non-hip fracture (HR 2.02; 95% CI 1.94-2.12). Performance results were similar in the validation sample.

CONCLUSIONS: We developed and validated a series of risk prediction models that can identify NH residents at greatest risk for FRI. In NH, these models should help target preventive strategies.

Language: en

Keywords

risk prediction; long-term care; fall-related injuries; fracture; functional assessment

Effects of a rollator on fall prevention in community-dwelling people with Parkinson's disease: a prospective cohort study

Okuyama K, Matuo Y. Clin. Park. Relat. Disord. 2023; 8: e100190.

(Copyright © 2023, International Association of Parkinsonism and Related Disorders, Publisher Elsevier Publishing)

DOI 10.1016/j.prdoa.2023.100190 **PMID** 36879629

Abstract

INTRODUCTION: This study aimed to investigate the effect of a rollator on the prevention of falls in patients with Parkinson's disease (PD) during outdoor walks.

METHOD: This study examined 30 community-dwelling patients with PD. Factors associated with falls were classified into clinical patient background, physical function, and psychophysiological function factors. The number of falls and subsequent injuries was observed over a period of greater than 6 months, if patients were using rollators while falls happened.

RESULTS: Participants who used a rollator had a significantly lower fall rate, number of falls, and injury rate than those who did not use a rollator ($p < 0.05$).

CONCLUSION: A rollator could protect patients with PD from falls. Additionally, when considering the use of a rollator for patients with PD, it is important to assess the patient's physical and psychophysiological functions.

Keywords: Rollator walkers

Language: en

Keywords

Falls; Parkinson's disease; Rollator

Effects of controlled whole-body vibration training on balance and fall outcomes among healthy older adults: a 6-week pilot study

Saucedo F, Chavez EA, Vanderhoof HR, Pradeep Ambati VN, Eggleston JD. JAR life 2022; 11: 31-37.

(Copyright © 2022)

DOI 10.14283/jarlife.2022.6 **PMID** 36923234

Abstract

BACKGROUND: Falling is the second leading cause of injury-related death worldwide and is a leading cause of injury among older adults. Whole-body vibration has been used to improve balance and reduce fall risk in older adults. No study has assessed if vibration benefits can be retained over time.

OBJECTIVES: The aims of this study were to examine if six-weeks of whole-body vibration could improve balance and fall outcomes, and to assess if benefits associated with the training program could be sustained two months following the final training session.

DESIGN AND SETTING: Repeated measures randomized controlled design.

PARTICIPANTS: Twenty-four independent living older adults were recruited and were randomly assigned to the whole-body vibration or control group.

INTERVENTION: Participants performed three sessions of whole-body vibration training per week with a vibration frequency of 20 Hz or with only an audio recording of the vibration noise. An assessment of balance and fall outcomes was performed prior to, immediately following, and two-months after the completion of the training program.

MAIN OUTCOME MEASURES: Composite balance scores from the Berg Balance Scale and treadmill fall rates were assessed pre-training, post-training, and two-months post-training.

RESULTS: Seventeen participants completed the study. No between groups differences were found ($p < 0.05$) in the measures of balance or fall rates.

CONCLUSIONS: Findings revealed that six weeks of whole-body vibration was not effective in improving balance scores or fall rates.

Language: en

Keywords

fall prevention; balance; walking; retention; Vibration exercise

Environmental interventions for preventing falls in older people living in the community

Clemson L, Stark S, Pighills AC, Fairhall NJ, Lamb SE, Ali J, Sherrington C. Cochrane Database Syst. Rev. 2023; 3: CD013258.

(Copyright © 2023, The Cochrane Collaboration, Publisher John Wiley and Sons)

DOI 10.1002/14651858.CD013258.pub2 **PMID** 36893804

Abstract

BACKGROUND: Falls and fall-related injuries are common. A third of community-dwelling people aged over 65 years fall each year. Falls can have serious consequences including restricting activity or institutionalisation. This review updates the previous evidence for environmental interventions in fall prevention.

OBJECTIVES: To assess the effects (benefits and harms) of environmental interventions (such as fall-hazard reduction, assistive technology, home modifications, and education) for preventing falls in older people living in the community.

SEARCH METHODS: We searched CENTRAL, MEDLINE, Embase, other databases, trial registers, and reference lists of systematic reviews to January 2021. We contacted researchers in the field to identify additional studies.

SELECTION CRITERIA: We included randomised controlled trials evaluating the effects of environmental interventions (such as reduction of fall hazards in the home, assistive devices) on falls in community-residing people aged 60 years and over.

DATA COLLECTION AND ANALYSIS: We used standard methodological procedures expected by Cochrane. Our primary outcome was rate of falls. **MAIN RESULTS:** We included 22 studies from 10 countries involving 8463 community-residing older people. Participants were on average 78 years old, and 65% were women. For fall outcomes, five studies had high risk of bias and most studies had unclear risk of bias for one or more risk of bias domains. For other outcomes (e.g. fractures), most studies were at high risk of detection bias. We downgraded the certainty of the evidence for high risk of bias, imprecision, and/or inconsistency. Home fall-hazard reduction (14 studies, 5830 participants) These interventions aim to reduce falls by assessing fall hazards and making environmental safety adaptations (e.g. non-slip strips on steps) or behavioural strategies (e.g. avoiding clutter). Home fall-hazard interventions probably reduce the overall rate of falls by 26% (rate ratio (RaR) 0.74, 95% confidence interval (CI) 0.61 to 0.91; 12 studies, 5293 participants; moderate-certainty evidence); based on a control group risk of 1319 falls per 1000 people a year, this is 343 (95% CI 118 to 514) fewer falls. However, these interventions were more effective in people who are selected for higher risk of falling, with a reduction of 38% (RaR 0.62, 95% CI 0.56 to 0.70; 9 studies, 1513 participants; 702 (95% CI 554 to 812) fewer falls based on a control risk of 1847 falls per 1000 people; high-certainty evidence). We found no evidence of a reduction in rate of falls when people were not selected for fall risk (RaR 1.05, 95% CI 0.96 to 1.16; 6 studies, 3780 participants; high-certainty evidence).

FINDINGS were similar for the number of people experiencing one or more falls. These interventions probably reduce the overall risk by 11% (risk ratio (RR) 0.89, 95% CI 0.82 to 0.97; 12 studies, 5253 participants; moderate-certainty evidence); based on a risk of 519 per 1000 people per year, this is 57 (95% CI 15 to 93) fewer fallers. However, for people at higher risk of falling, we found a 26% decrease in risk (RR 0.74, 95% CI 0.65 to 0.85; 9 studies, 1473 participants), but no decrease for unselected populations (RR 0.99, 95% CI 0.92 to 1.07; 6 studies, 3780 participants) (high-certainty evidence). These interventions probably make little or no important difference to health-related quality of life (HRQoL) (standardised mean difference 0.09, 95% CI -0.10 to 0.27; 5 studies, 1848 participants; moderate-certainty evidence). They may make little or no difference to the risk of fall-related fractures (RR 1.00, 95% CI 0.98 to 1.02; 2 studies, 1668 participants), fall-related hospitalisations (RR 0.96, 95% CI 0.87 to 1.06; 3 studies, 325 participants), or in the rate of falls requiring medical attention (RR 0.91, 95% CI 0.58 to 1.43; 3 studies, 946 participants) (low-certainty evidence). The evidence for number of fallers requiring medical attention was unclear (2 studies, 216 participants; very low-certainty evidence). Two studies reported no adverse events. Assistive technology Vision improvement interventions may make little or no difference to the rate of falls (RR 1.12, 95% CI 0.84 to 1.50; 3 studies, 1489 participants) or people experiencing one or more falls (RR 1.09, 95% CI 0.79 to 1.50) (low-certainty evidence). We are unsure of the evidence for fall-related fractures (2 studies, 976 participants) and falls requiring medical attention (1 study, 276 participants) because the certainty of the evidence is very low. There may be little or no difference in HRQoL (mean difference 0.40, 95% CI -1.12 to 1.92) or adverse events (falls while switching glasses; RR 1.00, 95% CI 0.98 to 1.02) (1 study, 597 participants; low-certainty evidence).

RESULTS for other assistive technology - footwear and foot devices, and self-care and assistive devices (5 studies, 651 participants) - were not pooled due to the diversity of interventions and contexts. Education We are uncertain whether an education intervention to reduce home fall hazards reduces the rate of falls or the number of people experiencing one or more falls (1 study; very low-certainty evidence). These interventions may make little or no difference to the risk of fall-related fractures (RR 1.02, 95% CI 0.96 to 1.08; 1 study, 110 participants; low-certainty evidence). Home modifications We found no trials of home modifications that measured falls as an outcome for task enablement and functional independence.

AUTHORS' CONCLUSIONS: We found high-certainty evidence that home fall-hazard interventions are effective in reducing the rate of falls and the number of fallers when targeted to people at higher risk of falling, such as having had a fall in the past year and recently hospitalised or needing support with daily activities. There was evidence of no effect when interventions were targeted to people not selected for risk of falling. Further research is needed to examine the impact of intervention components, the effect of awareness raising, and participant-interventionist engagement on decision-making and adherence. Vision improvement interventions may or may not impact the rate of falls. Further research is needed to answer clinical questions such as whether people should be given advice or take additional precautions when changing eye prescriptions, or whether the intervention is more effective when targeting people at higher risk of falls. There was insufficient evidence to determine whether education interventions impact falls. Language: en

Executive function and prospective falls: a 6-year longitudinal study in community-dwelling older adults

Smith C, Seematter-Bagnoud L, Santos-Eggimann B, Krief H, Büla CJ. BMC Geriatr. 2023; 23(1): e140.

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

DOI 10.1186/s12877-023-03790-9 **PMID** 36899323

Abstract

BACKGROUND: Older people with impaired executive function (EF) might have an increased fall risk, but prospective studies with prolonged follow-up are scarce. This study aimed to investigate the association between a) EF at baseline; b) 6-year decline in EF performance; and fall status 6 years later.

METHODS: Participants were 906 community-dwelling adults aged 65-69 years, enrolled in the Lausanne 65 + cohort. EF was measured at baseline and at 6 years using clock drawing test (CDT), verbal fluency (VF), Trail Making Test (TMT) A and B, and TMT ratio (TMT-B - TMT-A/TMT-A). EF decline was defined as clinically meaningful poorer performance at 6 years. Falls data were collected at 6 years using monthly calendars over 12 months.

RESULTS: Over 12-month follow-up, 13.0% of participants reported a single benign fall, and 20.2% serious (i.e., multiple and/or injurious) falls. In multivariable analysis, participants with worse TMT-B performance (adjusted Relative Risk Ratio, adjRRR(TMT-B worst quintile) = 0.38, 95%CI:0.19-0.75, $p = .006$) and worse TMT ratio (adjRRR(TMT ratio worst quintile) = 0.31, 95%CI:0.15-0.64, $p = .001$) were less likely to report a benign fall, whereas no significant association was observed with serious falls. In a subgroup analysis among fallers, participants with worse TMT-B (OR:1.86, 95%CI = 0.98-3.53, $p = .059$) and worse TMT ratio (OR:1.84, 95%CI = 0.98-3.43, $p = .057$) tended to have higher odds of serious falls. EF decline was not associated to higher odds of falls.

CONCLUSIONS: Participants with worse EF were less likely to report a single benign fall at follow-up, while fallers with worse EF tended to report multiple and/or injurious falls more frequently. Future studies should investigate the role of slight EF impairment in provoking serious falls in active young-old adults.

Language: en

Keywords

Falls; Cognitive impairment; Executive functions; Multiple fallers

Fall-related injuries at home: descriptive analysis from a Middle Eastern level 1 trauma center

El-Menyar A, Mekkodathil AA, Elmenyar E, Gomaa B, Abdelrahman H, Consunji R, Abeid A, Peralta R, Cander B, Al-Thani H. Ulus. Travma Acil Cerrahi Derg. 2023; 29(3): 284-291.

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

DOI 10.14744/tjtes.2022.86211 **PMID** 36880616

Abstract

BACKGROUND: Injuries caused by falls from heights (FFH) and fall of heavy objects (FHO) in residential settings are underestimated in the Middle East. We aimed to describe the fall-related injuries at home requiring admission at a level 1 trauma center.

METHODS: We conducted a retrospective analysis of patients who were admitted following fall-related injuries at home between 2010 and 2018. Comparative analyses were performed based on age groups (<18, 19-54, 55-64, and ≥65 years), gender, severity of injuries, and height of fall. Time series analysis of fall-related injuries was performed.

RESULTS: A total of 1402 patients were hospitalized due to fall-related injuries occurred at home (11% of total trauma admissions). Three quarters of victims were male. The most injured subjects were young and middle-aged (41.6%), followed by pediatric (37.2%) and elderly subjects (13.6%). FFH was the most frequent mechanism of injury (94%) followed by FHO (6%). Head injury was most common (42%) followed by lower extremity injury (19%). Older adults (≥65 years) had more complications, longer hospital stay, and higher in-hospital mortality. Patients who fell from greater heights had more chest and spinal injuries with greater severity and longer stay in the hospital. Time-series analysis did not show a seasonal variation of fall-related hospitalization.

CONCLUSION: This study showed that 11% of trauma hospitalizations were related to fall at home. FFH was common in all age groups; however, FHO was more evident in the pediatric group. Preventive efforts should address the circumstances of trauma in the residential settings to better inform evidence-based prevention strategies.

Language: en

Keywords

Aged; Child; Humans; Female; Male; Middle Aged; Hospitalization; Retrospective Studies; *Accidental Falls; *Craniocerebral Trauma; Trauma Centers

Falls caused by balance disorders in the elderly with multiple systems involved: pathogenic mechanisms and treatment strategies

Xing L, Bao Y, Wang B, Shi M, Wei Y, Huang X, Dai Y, Shi H, Gai X, Luo Q, Yin Y, Qin D. *Front. Neurol.* 2023; 14: e1128092.

(Copyright © 2023, Frontiers Research Foundation)

DOI 10.3389/fneur.2023.1128092 **PMID** 36908603

Abstract

Falls are the main contributor to both fatal and nonfatal injuries in elderly individuals as well as significant sources of morbidity and mortality, which are mostly induced by impaired balance control. The ability to keep balance is a remarkably complex process that allows for rapid and precise changes to prevent falls with multiple systems involved, such as musculoskeletal system, the central nervous system and sensory system. However, the exact pathogenesis of falls caused by balance disorders in the elderly has eluded researchers to date. In consideration of aging phenomenon aggravation and fall risks in the elderly, there is an urgent need to explore the pathogenesis and treatments of falls caused by balance disorders in the elderly. The present review discusses the epidemiology of falls in the elderly, potential pathogenic mechanisms underlying multiple systems involved in falls caused by balance disorders, including musculoskeletal system, the central nervous system and sensory system. Meanwhile, some common treatment strategies, such as physical exercise, new equipment based on artificial intelligence, pharmacologic treatments and fall prevention education are also reviewed. To fully understand the pathogenesis and treatment of falls caused by balance disorders, a need remains for future large-scale multi-center randomized controlled trials and in-depth mechanism studies.

Language: en

Keywords

elderly; balance; fall; mechanism; pathogenesis; treatments

Hospitalization costs of injury in elderly population in China: a quantile regression analysis

Ou W, Zhang Q, He J, Shao X, Yang Y, Wang X. BMC Geriatr. 2023; 23(1): e143.

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

DOI 10.1186/s12877-023-03729-0 **PMID** 36918769

Abstract

BACKGROUND: Trauma in the elderly is gradually growing more prevalent as the aging population increases over time. The purpose of this study is to assess hospitalization costs of the elderly trauma population and analyze the association between those costs and the features of the elderly trauma population.

METHODS: In a retrospective analysis, data on trauma patients over 65 who were admitted to the hospital for the first time due to trauma between January 2017 and March 2022 was collected from a tertiary comprehensive hospital in Baotou. We calculated and analyzed the hospitalization cost components. According to various therapeutic approaches, trauma patients were divided into two subgroups: non-surgical patients (1320 cases) and surgical patients (387 cases). Quantile regression was used to evaluate the relationship between trauma patients and hospitalization costs.

RESULTS: This study comprised 1707 trauma patients in total. Mean total hospitalization costs per patient were ¥20,741. Patients with transportation accidents incurred the highest expenditures among those with external causes of trauma, with a mean hospitalization cost of ¥24,918, followed by patients with falls at ¥19,809 on average. Hospitalization costs were dominated by medicine costs (¥7,182 per capita). According to the quantile regression results, all trauma patients' hospitalization costs were considerably increased by length of stay, surgery, the injury severity score (16-24), multimorbidity, thorax injury, and blood transfusion. For non-surgical patients, length of stay, multimorbidity, and the injury severity score (16-24) were all substantially linked to higher hospitalization costs. For surgical patients, length of stay, injury severity score (16-24), and hip and thigh injuries were significantly associated with greater hospitalization costs.

CONCLUSIONS: Using quantile regression to identify factors associated with hospitalization costs could be helpful for addressing the burden of injury in the elderly population. Policymakers may find these findings to be insightful in lowering hospitalization costs related to injury in the elderly population.

Language: en

Keywords

Aged; Humans; Injury; Length of Stay; Retrospective Studies; China/epidemiology; Regression Analysis; *Hospitalization; Elderly population; Hospitalization costs; Quantile regression

Immersive virtual tasks with motor and cognitive components: a feasibility study of adults and older adult fallers and nonfallers

Bacha JMR, Pereira GAF, Silva IBAN, Kim DHC, Massaro AB, Vieira KS, Torriani-Pasin C, Deutsch JE, Lopes RD, Pompeu JE. *Cyberpsychol. Behav. Soc. Netw.* 2023; 26(3): 169-176.

(Copyright © 2023, Mary Ann Liebert Publishers)

DOI 10.1089/cyber.2022.0025 **PMID** 36880892

Abstract

The objective of the present study was to compare the feasibility, safety, and satisfaction of an immersive virtual reality system developed specifically for cognitive-sensory-motor training among older adult fallers and nonfallers and adult individuals. This was a cross-sectional observational study, and 20 adults, 20 nonfaller older adults, and 20 faller older adults were assessed. The primary outcome was feasibility assessed with safety and satisfaction measures. Safety outcomes were associated with adverse events occurred during the experience with the immersive virtual reality system (IVRS), assessed through the Simulator Sickness Questionnaire and by registering the falls, pain, or any discomfort reported by the participants. Satisfaction was assessed with a structured questionnaire, answered after 10 minutes of experiencing the IVRS. The data were assessed with one-way analysis of variance or the Kruskal-Wallis test and Bonferroni post hoc test. The results showed that the IVRS was safe and the participants related good satisfaction with the system. Most of participants related no symptoms (93.6 percent) or light cybersickness symptoms (6.0 percent). There were no occurrences of falls or pain associated with the IVRS. The IVRS was feasible for adults and nonfaller and faller older adults.

Language: en

Keywords

Aged; Humans; Cross-Sectional Studies; Feasibility Studies; aged; Cognition; cognition; virtual reality; *Cognitive Training; *Pain; postural balance; risk of falls

Improving balance in community-dwelling elders using trained volunteers within faith-based institutions: a mixed methods feasibility study

Rosewilliam S, Greaves CJ, Selvanayagam A, Soundy AA. Disabil. Rehabil. 2023; ePub(ePub): ePub.

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

DOI 10.1080/09638288.2023.2185293 **PMID** 36895134

Abstract

PURPOSE: To investigate the feasibility and acceptability of a volunteer-led balance programme for older adults.

METHODS: A feasibility cluster RCT with focus groups were conducted in faith-based institutions. Eligibility criteria were: participants were ≥ 65 years, able to do five times sit -to-stand, had no falls in the previous six months and had good mental capacity. The intervention included supervised group exercises and exercise booklets for six months, education and a fall poster. Assessments included, TUG, MCTSIB, FTST, FES, mABC, OPQoL and DGLS at baseline, 6 weeks, and 6 months. Feasibility measures included numbers of volunteers, sessions, and volunteers' time commitment, views of participants about sustainability of program using qualitative focus groups and volunteers' ability to deliver programme.

RESULTS: Three churches participated with 31 participants in each group. Participants had a mean age of 77.3 years, were 100% British, and 79% female. The sample size estimate for a future trial using TUG, was 79 per group. Focus groups showed perceived social and physical improvements in participants, need to extend the programme to the wider community, and increased confidence, participation and socialisation.

CONCLUSION: The community-based balance training in faith-based institutions, was feasible and acceptable in one geographical area and requires evaluation in cohesive diverse communities. Implications for Rehabilitation If an institution or a community is united through faith, culture, national roots, or tradition, then these groups are ideal for such balance rehabilitation programmes, because of the familiarity of the location and people, cohesive culture or their ideology to help their communities. Participants and volunteers perceived improved participation, confidence and socialisation and were keen to continue programme. It is important to develop community-based falls prevention programmes that the National Health Service (NHS) can partially support using volunteers to reduce the burden of falls in the community and for the NHS.

Language: en

Keywords

Older people; Balance improvement; Community falls; Faith institutions; Volunteer-led

Introducing CatchUTM): a novel multisensory tool for assessing patients' risk of falling

Mahoney JR, George CJ, Verghese J. J. Percept. Imaging 2022; 5: jpi0146.

(Copyright © 2022, Society of Imaging Science and Technology)

DOI 10.2352/j.percept.imaging.2022.5.000407 **PMID** 36919152

Abstract

To date, only a few studies have investigated the clinical translational value of multisensory integration. Our previous research has linked the magnitude of visual-somatosensory integration (measured behaviorally using simple reaction time tasks) to important cognitive (attention) and motor (balance, gait, and falls) outcomes in healthy older adults. While multisensory integration effects have been measured across a wide array of populations using various sensory combinations and different neuroscience research approaches, multisensory integration tests have not been systematically implemented in clinical settings. We recently developed a step-by-step protocol for administering and calculating multisensory integration effects to facilitate innovative and novel translational research across diverse clinical populations and age-ranges. In recognizing that patients with severe medical conditions and/or mobility limitations often experience difficulty traveling to research facilities or joining time-demanding research protocols, we deemed it necessary for patients to be able to benefit from multisensory testing. Using an established protocol and methodology, we developed a multisensory falls-screening tool called CatchU (TM) (an iPhone app) to quantify multisensory integration performance in clinical practice that is currently undergoing validation studies. Our goal is to facilitate the identification of patients who are at increased risk of falls and promote physician-initiated falls counseling during clinical visits (e.g., annual wellness, sick, or follow-up visits). This will thereby raise falls-awareness and foster physician efforts to alleviate disability, promote independence, and increase quality of life for our older adults. This conceptual overview highlights the potential of multisensory integration in predicting clinical outcomes from a research perspective, while also showcasing the practical application of a multisensory screening tool in routine clinical practice.

Language: en

Multi-directional nature of falls among older adults: a rationale for prevention and management

Smith ML, Ory MG. *Front. Public Health* 2023; 11: e1117863.

(Copyright © 2023, Frontiers Editorial Office)

DOI 10.3389/fpubh.2023.1117863 **PMID** 36895692

Abstract

The global aging population is larger than ever before (1), and it is estimated that 155 countries will have an aging society by the year 2050 (2). In the United States alone, there are more than 50 million adults ages 65 years and older, with this sub-population projected to exceed more than 80 million by 2040 (3). The growing aging population reflects longer life expectancies largely attributed to a combination of medical advancements, accessible healthcare, and supportive and inclusive physical and social environments (4). While there is much variability in the aging process (5), the expansive older adult population brings with it increased prevalence rates of chronic conditions and other health issues (e.g., injurious falls, cognitive decline, malnutrition, mental illness, and social disconnectedness) that will further strain the already over-burdened healthcare system. While there are many pressing and costly geriatric conditions deserving of increased and immediate attention, we will focus on older adult falls as an example of a globally-recognized, age-related condition with a host of negative, but potentially preventable, sequelae (6, 7). Too often falls are narrowly viewed as a natural and inevitable part of aging, which cannot be prevented or managed. The complex and multi-factorial circumstances resulting in a fall require a more holistic view of the event (i.e., causes, facilitators, and contributors) and the older adults' physical, mental, environmental, and medical context. We contend that falls is among the most germane health issues facing older adults because a fall can represent a constellation of interwoven health events and may be centric to multi-level solutions spanning research, healthcare practice, community programming, and policy. This article aims to expand the lens through which we view falls as a public health issue by: (a) offering insights about the upstream indicators and downstream ramifications associated with falls; and (b) highlighting opportunities for interdisciplinary and cross-sectorial solutions to predict, prevent, and manage falls among older adults...

Language: en

Keywords

Risk Factors; older adults; falls; intervention; *Accidental Falls/prevention & control; evidence-based practice; fall prevention and management; multi-level intervention

Older people's out-of-home mobility and wellbeing in Australia: personal, built environment, and transportation factors associated with unmet mobility needs

Ma T, Kobel C, Ivers R. *Front. Public Health* 2023; 11: e1121476.

(Copyright © 2023, Frontiers Editorial Office)

DOI 10.3389/fpubh.2023.1121476 **PMID** 36891328

Abstract

Out-of-home mobility is fundamental to older people's wellbeing and quality of life. Understanding the unmet mobility needs of older people is a necessary starting point for determining how they can be supported to be mobile. This study estimates the extent of unmet mobility needs among older Australians and identifies the characteristics of those most likely to report unmet mobility needs. Analysis was conducted on nationally representative data of 6,685 older Australians drawn from the 2018 Survey of Disability, Aging and Carers conducted by the Australian Bureau of Statistics. Twelve predictor variables from two conceptual frameworks on older people's mobility were included in the multiple logistic regression model. Twelve percent ($n = 799$) of participants had unmet mobility needs, and associated factors significant in multivariable models included being among the "young-old", having a lower income, having lower levels of self-rated health, having a long-term condition, being limited in everyday physical activities, experiencing a higher level of distress, being unlicensed, having decreased public transport ability, and residing in major cities. Efforts to support older people's mobility must make equity an explicit consideration, reject a one-size-fits-all approach, and prioritize the accessibility of cities and communities.

Language: en

Keywords

Aged; Australia; Humans; Aging; *Disabled Persons; *Quality of Life; age-friendly city; Built Environment; community mobility; healthy aging; healthy city; transport mobility

Preventing falls in older people: the evidence for environmental interventions and why history matters

Lewis SR, Griffin XL. Cochrane Database Syst. Rev. 2023; 3: ED000162.

(Copyright © 2023, The Cochrane Collaboration, Publisher John Wiley and Sons)

DOI 10.1002/14651858.ED000162 **PMID** 36896853

Abstract

Falls in older people are common, with 1 in 3 people over 65 years of age and half of those over 80 years of age likely to have at least one fall each year.[1] Whilst many falls result in minor injuries, 10% to 20% of falls in this age group result in fractures,[2] and each year an estimated 684,000 older people globally have falls that result in death.[3] In 2017, almost 172 million falls led to new injuries.[4] Loss of confidence after falls may also reduce an older person's physical activity and lead to social isolation.[5] Falls are a common reason for admission to care facilities,[6] and a significant economic burden on inpatient care.[7]

The first Cochrane Review on fall prevention strategies in older people was published in 1997. Since then, the review has had regular updates and has been split into separate reviews - first into different population groups (people living in the community and people living in care settings), and then according to more specific types of interventions. This has been driven by ongoing research in this field, demonstrating the increasing importance given to preventable injuries in older people.

The Cochrane Review and meta-analysis by Clemson and colleagues evaluated one of these more specific intervention types - environmental approaches to reducing the risk of falls in older people living in the community.[8] These interventions are aimed at improving safety at home, outdoors, and in community and public places. The review authors grouped the interventions into four categories based on the Prevention of Falls Network Europe (ProFaNE) taxonomy:[9] home fall-hazard reduction interventions; assistive technology interventions; education interventions; and home modifications.

The review included 22 studies involving 8463 community-residing older people. Most of the available evidence (14 studies, 5830 participants) was for just one of the pre-specified intervention categories: home fall-hazard reduction interventions. In these studies, participants were typically visited by an occupational therapist in their own home. Usually, this was a single visit with follow-up such as a telephone call. Some studies, however, conducted a second or further visits if required. The purpose of the visits was to identify and assess fall hazards, raise awareness of fall risks, jointly problem-solve, and in some cases also provide assistive technologies. Studies included populations with variable baseline risks of falling; although there was a subset of studies conducted only in older people at higher risk of falling...

Language: en

Keywords

Aged; Humans; Public health; *Exercise; Effective practice & health systems

Risk factors for fall among the elderly with diabetes mellitus type 2 in Jeddah, Saudi Arabia, 2022: a cross-sectional study

Alasmari RS, Hassani HA, Almalky NA, Bokhari AF, Al Zahrani A, Hafez AA. Ann. Med. Surg. (Lond.) 2023; 85(3): 412-417.

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

DOI 10.1097/MS9.0000000000000269 **PMID** 36923742

Abstract

Diabetes mellitus type 2 is a major chronic condition that is considered common among elderly people, with multiple potential complications that could contribute to falls. However, this concept is not well understood; thus, the aim of this study is to estimate the prevalence of falls among diabetes patients.

METHODS: In this observational cross-sectional study, 309 diabetic patients aged 60 years or more who visited the primary healthcare centers of the Ministry of National Guard - Health Affairs in Jeddah were chosen via convenience sampling method. To collect the data, a structured Fall Risk Assessment questionnaire and Fall Efficacy Score scale were used.

RESULTS: The mean age of the participants was estimated to be 68.5 (SD: 7.4) years. Among the participants, 48.2% have fallen before, and 63.1% of them suffered falls in the past 12 months. The results showed that gait problems were independently associated with a higher likelihood of falls among elderly patients [odds ratio (OR)=1.98; 95% CI: 1.08-3.62; P=0.026]. Based on the linear regression analysis, we identified the following risk factors for lower falls efficacy: having gait problems (β =12.50; 95% CI: 7.38-17.6; P<0.001), balance difficulties (β =6.58; 95% CI: 1.35-11.8; P=0.014), and neurological/cognitive impairments (β =9.62; 95% CI: 3.89-15.4; P=0.001), as well as having poor sleep quality (β =8.11, 95% CI: 3.32-12.9; P<0.001).

CONCLUSION: This paper suggests that diabetes mellitus is an independent fall risk factor among the elderly. Therefore, identifying such patients as being at higher risk and prompt referral to a specialist falls clinic is recommended.

Language: en

Keywords

elderly; risk factors; diabetes; fall

Are age, self-selected walking speed, or propulsion force predictors of gait-related changes in older adults?

Malde D, Pizzimenti N, McCamley J, Sumner B. J. Appl. Biomech. 2023; ePub(ePub): ePub.

(Copyright © 2023, Human Kinetics Publishers)

DOI 10.1123/jab.2022-0026 **PMID** 36898389

Abstract

There is limited research that directly compares the effect of reduced speed with reduced propulsive force production (PFP) on age-related gait changes. We aimed to determine how changes in the gait of older adults correlate with age, speed, or peak PFP over a 6-year span. We collected kinematics and kinetics of 17 older subjects at 2 time points. We determined which biomechanical variables changed significantly between visits and used linear regressions to determine whether combinations of self-selected walking speed, peak PFP, and age correlated to changes in these variables. We found a suite of gait-related changes that occurred in the 6-year period, in line with previous aging studies. Of the 10 significant changes, we found 2 with significant regressions. Self-selected walking speed was a significant indicator of step length, not peak PFP or age. Peak PFP was a significant indicator for knee flexion. None of the biomechanical changes were correlated to the chronological age of the subjects. Few gait parameters had a correlation to the independent variables, suggesting that changes in gait mechanics were not solely correlated to peak PFP, speed, and/or age. This study improves understanding of changes in ambulation that lead to age-related gait modifications.

Language: en

Keywords

aging; longitudinal study; ambulation; propulsive force production

From fear of falling to choking under pressure: a predictive processing perspective of disrupted motor control under anxiety

Harris DJ, Wilkinson S, Ellmers TJ. *Neurosci. Biobehav. Rev.* 2023; ePub(ePub): ePub.

(Copyright © 2023, Elsevier Publishing)

DOI 10.1016/j.neubiorev.2023.105115 **PMID** 36906243

Abstract

Under the Predictive Processing Framework, perception is guided by internal models that map the probabilistic relationship between sensory states and their causes. Predictive processing has contributed to a new understanding of both emotional states and motor control but is yet to be fully applied to their interaction during the breakdown of motor movements under heightened anxiety or threat. We bring together literature on anxiety and motor control to propose that predictive processing provides a unifying principle for understanding motor breakdowns as a disruption to the neuromodulatory control mechanisms that regulate the interactions of top-down predictions and bottom-up sensory signals. We illustrate this account using examples from disrupted balance and gait in populations who are anxious/fearful of falling, as well as 'choking' in elite sport. This approach can explain both rigid and inflexible movement strategies, as well as highly variable and imprecise action and conscious movement processing, and may also unite the apparently opposing self-focus and distraction approaches to choking. We generate predictions to guide future work and propose practical recommendations.

Language: en

Keywords

Bayesian; anxiety; gait; active inference; choking; threat

Occupational fall risk assessment tool for older workers

Osuka Y, Okubo Y, Nofuji Y, Maruo K, Fujiwara Y, Oka H, Shinkai S, Lord SR, Sasai H. Occup. Med. 2023; ePub(ePub): ePub.

(Copyright © 2023, Oxford University Press)

DOI 10.1093/occmed/kqad035 PMID 36893360

Abstract

BACKGROUND: No easy-to-use fall risk assessment tools have been devised to assess occupational fall risk in older workers. **AIMS:** To develop an Occupational Fall Risk Assessment Tool (OFRAT) and report its predictive validity and reliability in older workers.

METHODS: The baseline fall risk assessment was completed by 1113 participants aged ≥ 60 years who worked ≥ 4 days/month in Saitama, Japan. Participants were followed up for falls during occupational activities for 1 year, and 30 participants were assessed twice for test-retest reliability. The following assessment measures were summed to form the OFRAT risk score: older age, male sex, history of falls, physical work participation, diabetes, use of medications increasing fall risk, reduced vision, poor hearing, executive dysfunction and slow stepping. The scores were then classified into four grades (0-2 points: very low, 3 points: low, 4 points: moderate and ≥ 5 points: high).

RESULTS: During follow-up, 112 participants fell 214 times during work. The negative binomial regression model showed that participants with higher grades had a higher incidence rate ratio [95% confidence interval] for falls than those with very low grades (low: 1.64 [1.08-2.47], moderate: 4.23 [2.82-6.34] and high: 6.12 [3.83-9.76]). The intraclass correlation coefficient for risk score was 0.86 [0.72-0.93], and the weighted kappa coefficient for grade assessment was 0.74 [0.52-0.95].

CONCLUSIONS: The OFRAT is a valid and reliable tool for estimating the occupational fall risk in older workers. It may assist occupational physicians implement strategies to prevent falls in this group.

Language: en

Relationship between cognitive decline and daily life gait among elderly people living in the community: a preliminary report

Yamagami T, Yagi M, Tanaka S, Anzai S, Ueda T, Omori Y, Tanaka C, Shiba Y. Dement. Geriatr. Cogn. Dis. Extra 2023; 13(1): 1-9.

(Copyright © 2023, Karger Publishers)

DOI 10.1159/000528507 PMID 36891225

Abstract

INTRODUCTION: Early detection and intervention are important to prevent dementia. Gait parameters have been recognized as a potentially easy screening tool for mild cognitive impairment (MCI); however, differences in gait parameters between cognitive healthy individuals (CHI) and MCI are small. Daily life gait change may be used to detect cognitive decline earlier. In the present study, we aimed to clarify the relationship between cognitive decline and daily life gait.

METHODS: We performed 5-Cog function tests and daily life and laboratory-based gait assessments on 155 community-dwelling elderly people (75.5 ± 5.4 years old). Daily life gait was measured for 6 days using an iPod-touch with an accelerometer. Laboratory-based 10-m gait (fast pace) was measured using an electronic portable walkway.

RESULTS: The subjects consisted of 98 CHI (63.2%) and 57 cognitive decline individuals (CDI; 36.8%). Daily life maximum gait velocity in the CDI group (113.7 [97.0-128.5] cm/s) was significantly slower than that in the CHI group (121.2 [105.8-134.3] cm/s) ($p = 0.032$). In the laboratory-based gait, the stride length variability in the CDI group (2.6 [1.8-4.1]) was significantly higher than that in the CHI group (1.8 [1.2-2.7]) ($p < 0.001$). The maximum gait velocity in daily life gait was weakly but significantly correlated with stride length variability in laboratory-based gait ($\rho = -0.260$, $p = 0.001$).

CONCLUSION: We found an association between cognitive decline and slower daily life gait velocity among community-dwelling elderly people.

Language: en

Keywords

Prevention; Dementia; Mild cognitive impairment; Community-dwelling elderly people; Daily life gait velocity

Risk factors and consequences of depression in later life: findings from the Health In Men Study (HIMS)

Almeida OP. Aging brain 2021; 1: e100014.

(Copyright © 2021, Elsevier Publishing)

DOI 10.1016/j.nbas.2021.100014 **PMID** 36911509

Abstract

BACKGROUND: The Health In Men Study (HIMS) has been collecting data on risk factors and health events for the past 25 years in a large community-representative sample of older men. This paper summarises key-findings of the study about depression in later life.

METHODS: Narrative review of selected HIMS studies published over the past 15 years describing risk factors associated with prevalent and incident depression in older men, as well as clinical outcomes associated with depression.

RESULTS: Data from HIMS showed that cardiovascular diseases and risk factors are associated with increased risk of depression, but this association is neither specific nor causative.

FINDINGS from HIMS are not supportive of the vascular hypothesis of depression in later life. Studies investigating lifestyle have generated risk tables capable of guiding risk reduction strategies. Other potentially modifiable risk factors associated with depression in the HIMS cohort included abnormal allostatic inflammatory response, high plasma homocysteine and low testosterone. The results from HIMS also showed that depression is most likely a prodromal manifestation of dementia rather than a true risk factor, but it increases frailty and mortality. The association between depression and suicide in older men is largely mediated by deteriorating health and increasing frailty.

CONCLUSION: HIMS has contributed to advance knowledge about risk factors associated with depression, as well as the health consequences of depression in older men. The study is ongoing and the investigators welcome the opportunity to share data with colleagues who are interested in the health of older people.

Language: en

Keywords

Epidemiology; Mortality; Comorbidity; Alcohol; Physical activity; Depression; Falls; Smoking; Fractures; Stroke; Risk factors; Inflammation; Frailty; Obesity; Cardiovascular disease; Depressive disorder; Diabetes; Homocysteine; Testosterone; Vitamin D

The design and engineering of a fall and near-fall detection electronic textile

Rahemtulla Z, Turner A, Oliveira C, Kaner J, Dias T, Hughes-Riley T. *Materials* (Basel) 2023; 16(5): e1920.

(Copyright © 2023, MDPI: Multidisciplinary Digital Publishing Institute)

DOI 10.3390/ma16051920 **PMID** 36903036

Abstract

Falls can be detrimental to the quality of life of older people, and therefore the ability to detect falls is beneficial, especially if the person is living alone and has injured themselves. In addition, detecting near falls (when a person is imbalanced or stumbles) has the potential to prevent a fall from occurring. This work focused on the design and engineering of a wearable electronic textile device to monitor falls and near-falls and used a machine learning algorithm to assist in the interpretation of the data. A key driver behind the study was to create a comfortable device that people would be willing to wear. A pair of over-socks incorporating a single motion sensing electronic yarn each were designed. The over-socks were used in a trial involving 13 participants. The participants performed three types of activities of daily living (ADLs), three types of falls onto a crash mat, and one type of near-fall. The trial data was visually analyzed for patterns, and a machine learning algorithm was used to classify the data. The developed over-socks combined with the use of a bidirectional long short-term memory (Bi-LSTM) network have been shown to be able to differentiate between three different ADLs and three different falls with an accuracy of 85.7%, ADLs and falls with an accuracy of 99.4%, and ADLs, falls, and stumbles (near-falls) with an accuracy of 94.2%. In addition, results showed that the motion sensing E-yarn only needs to be present in one over-sock.

Language: en

Keywords

machine learning; older people; fall detection; design; activities of daily living; E-textiles; electronic textiles; electronic yarn; near-fall detection; smart textiles