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Alarming and/or alerting device effectiveness in reducing falls in long-term care (LTC) facilities? A systematic review

Mileski M, Brooks M, Topinka JB, Hamilton G, Land C, Mitchell T, Mosley B, McClay R. Healthcare (Basel) 2019; 7(1): e7010051.

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DOI

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PMID

30934633

Abstract

Perceptions against the use of alarming devices persist in long-term care environments as they are seen as annoying, costly, and a waste of time to the staff involved. Ascertaining whether these perceptions are true or false via the literature was a focus of this study. Proper information to educate staff and to work past these perceptions can be a positive effector for resident safety. Many facilitators for the use of alarming devices were found, as well as many barriers to their use as well. New technology is changing the perceptions regarding these types of devices as time passes. Education is a key component for staff, residents, and families. There are "traditional" issues with the use of alarms such as alarm fatigue by caregivers, high costs of implementation, and issues with proper implementation of alarms. Alarms are perceived as intrusive and the noise from them can be a potential cause of falls. However, alarming devices can be a key intervention in the safety of those residents who are prone to falls. This requires proper implementation and education for all parties involved, and proper oversight surrounding use of the devices.

Language: en

Keywords

alarms; falls; quality improvement; safety; skilled nursing

Appraisal of clinical practice guideline: interventions to prevent falls in community-dwelling older adults: U.S. Preventive Services Task Force Recommendation Statement

Hancock M. J. Physiother. 2019; ePub(ePub): ePub.

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DOI

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PMID

30926399

Abstract

Date of latest update: April 2018.

Patient group: Community-dwelling older adults aged 65 years without known osteoporosis or vitamin D deficiency.

Intended audience: Clinicians who manage older adults at risk of falls, and older adults at risk of falls.

Additional versions : The current version is an update of the 2012 U.S. Preventive Services Task Force recommendation on the prevention of falls in community-dwelling older adults.

Expert working group: The U.S. Preventive Services Task Force comprising medical doctors, a registered nurse and clinical psychologist.

Funded by: The U.S. Preventive Services Task Force is an independent, voluntary body; however, it is supported by the Agency for Healthcare Research and Quality. The Agency for Healthcare Research and Quality staff had no role in approving the final recommendations.

Consultation with: A draft version was posted for public comment on the U.S. Preventive Services Task Force website from 26 September 2017 to 24 October 2017.

Location : The guidelines and links to additional documents are available at:

<https://jamanetwork.com/journals/jama/fullarticle/2678104>.

Description: This guideline and associated systematic review (<https://jamanetwork.com/journals/jama/fullarticle/2678103>) aim to assess the effectiveness and harms of interventions used in primary care to prevent falls and fall-related morbidity and mortality in community-dwelling adults aged 65 years without osteoporosis or vitamin D deficiency. The guideline is an update on the 2012 recommendations. The focus of the guideline is on summarising the evidence and providing recommendations for exercise interventions, multifactorial interventions, and vitamin D supplementation. Other interventions such as environmental modification, medication management and psychological interventions are briefly discussed, but the lack of available literature limited any definitive conclusions. For each recommendation provided the level of certainty is rated as high, moderate or low. The guideline is highly relevant to physiotherapists working with community-dwelling older adults.

Language: en

Automated remote fall detection using impact features from video and audio

Geertsema EE, Visser GH, Viergever MA, Kalitzin SN. J. Biomech.2019; ePub(ePub): ePub.

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PMID

30922611

Abstract

Elderly people and people with epilepsy may need assistance after falling, but may be unable to summon help due to injuries or impairment of consciousness. Several wearable fall detection devices have been developed, but these are not used by all people at risk. We present an automated analysis algorithm for remote detection of high impact falls, based on a physical model of a fall, aiming at universality and robustness. Candidate events are automatically detected and event features are used as classifier input. The algorithm uses vertical velocity and acceleration features from optical flow outputs, corrected for distance from the camera using moving object size estimation. A sound amplitude feature is used to increase detector specificity. We tested the performance and robustness of our trained algorithm using acted data from a public database and real life data with falls resulting from epilepsy and with daily life activities. Applying the trained algorithm to the acted dataset resulted in 90% sensitivity for detection of falls, with 92% specificity. In the real life data, six/nine falls were detected with a specificity of 99.7%; there is a plausible explanation for not detecting each of the falls missed. These results reflect the algorithm's robustness and confirms the feasibility of detecting falls using this algorithm.

Language: en

Keywords

Fall detection; Pattern recognition; Remote sensing; Video analysis

Balance problems and fall risks in the elderly

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30929881

Abstract

Falls in the elderly are an increasing problem causing a high degree of morbidity, mortality, and use of health care services. Identification of risk factors through medical assessment supports the provision of appropriate interventions that reduce rates of falling. Evaluation and intervention strategies are generally challenging because of the complex and multifactorial nature of falls. The clinician should consider screening for falls an important part of the functional evaluation in older adults. Several potential interventions have proven helpful as preventive strategies. Optimal approaches involve interdisciplinary collaboration in assessment and interventions, particularly exercise, attention to coexisting medical conditions, and reduction of environmental hazards.

Language: en

Keywords

Balance; Falls; Older adults; Risk factors

Decreased risk of falls in patients attending music sessions on an acute geriatric ward: results from a retrospective cohort study

Chabot J, Beauchet O, Fung S, Peretz I. BMC Complement. Altern. Med. 2019; 19(1): e76.

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DOI

10.1186/s12906-019-2484-x

PMID

30922356

Abstract

BACKGROUND: Music has been shown to improve health and quality of life. It was suggested that music may also have an impact on gait stability and fall risk. Yet, few studies have exploited music in the hospital setting, and even less so in the geriatric population. Our objective was to examine the influence of music listening on the risk of falls by comparing the Morse Fall Scale score in patients admitted to a Geriatric Assessment Unit (GAU) who attended music listening sessions and in patients who did not attend music sessions.

METHODS: This was a retrospective cohort study (mean follow-up 13.3 ± 6.8 days) which took place in a GAU, St. Mary's Hospital Center, Montreal. A total of 152 charts of participants, with a mean age of 85.7 ± 6.4 years and 88.2% female were reviewed and included. There were 61 participants exposed to the music listening sessions group and 91 in the non-exposed group matched for age, sex, cause and season of admission, and living situation. One-hour music sessions were provided to the patients by volunteer musicians. The Morse Fall Scale score upon admission and discharge as well as its variation (change from before to after exposure) were used as outcomes. Age, sex, living situation, reason for admission, season of admission, Mini Mental Status Examination score, number of therapeutic classes taken daily upon admission, use of psychoactive drugs upon admission and length of stay were used as covariates.

RESULTS: The Morse Fall Scale score decreased significantly in the exposed group compared to the non-exposed group ($p = 0.025$) and represented a small to medium-sized effect, $d = 0.395$. The multiple linear regression model showed a significant association between the decrease of the Morse Fall Scale score and music exposure ($B = -17.1$, $p = 0.043$).

CONCLUSION: Participating in music listening sessions was associated with a decreased risk of falls in patients admitted to a GAU. Further controlled research is necessary to confirm these findings and to determine the mechanisms by which music listening impacts fall risk. **TRIAL REGISTRATION:** Clinical trial registry: ClinicalTrials.gov. Registration number: NCT03348657 (November 17th, 2017). Retrospectively registered.

Language: en

Keywords

Elderly; Fall; Music

Dementia is associated with an increased risk of hip fractures: a nationwide analysis in Korea

Jeon JH, Park JH, Oh C, Chung JK, Song JY, Kim S, Lee SH, Jang JW, Kim YJ. *J. Clin. Neurol.* 2019; 15(2): 243-249.

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DOI

10.3988/jcn.2019.15.2.243

PMID

30938111

Abstract

BACKGROUND AND PURPOSE: Dementia has been reported to be associated with an increased risk of hip fracture, but few case-control studies have been performed to actually confirm this. This study investigated the association between dementia and hip fracture by comparing the risk of hip fracture between subjects with and without dementia.

METHODS: We examined a population-based matched cohort from the National Health Insurance Service-Senior Cohort data set that covers approximately half a million recipients of medical insurance in South Korea. Subjects with new clinically verified dementia during 2003-2007 were included, and five subjects without dementia were matched for age, sex, and index year to each subject with dementia as the controls. The risk of hip fracture for dementia was evaluated up to 2015 using Cox regression analysis.

RESULTS: During the 12-year follow-up period, 284 subjects with dementia (10.66%) and 603 subjects without dementia (4.53%) experienced hip fractures. Dementia was independently associated with a higher risk of hip fracture [hazard ratio (HR)=2.840, 95% CI=2.449-3.293] and the adjusted HR for hip fracture in the subjects with dementia was highest within 2 years after the initial diagnosis (HR=2.862, 95% CI=2.053-3.990).

CONCLUSIONS: This study found that dementia could be an independent risk factor for hip fracture even at the early stage. This necessitates consideration of the future risk of falls and balance deficits in terms of physical activity after a diagnosis of dementia.

Language: en

Keywords

dementia; fracture; hip

Despite active public health campaigns, death from falls increased 30% in the past decade: is ageism part of the barrier to self-awareness?

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Copyright

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30929879

Abstract

Public health messaging campaigns stating that falls are bad and can be prevented are not effective, as evidenced by a 30% increase in death from falls over the past decade. A first approach is to use measures of balance to show the magnitude of the problem. Second, the role of ageism as a barrier to required behavioral change should be addressed. Third, explanations should be provided regarding why mobility and balance have changed. As a counter to ageism, pros and cons for specific interventions and how these maximize momentum and mobility should be discussed.

Language: en

Keywords

Ageism; Injury from falls; Mobility and balance; Multisensory integration; Postural control

Discharge destination following hip fracture in Canada among previously community-dwelling older adults, 2004-2012: database study

Beaupre L, Sobolev B, Guy P, Kim JD, Kuramoto L, Sheehan KJ, Sutherland JM, Harvey E, Morin SN. *Osteoporos. Int.* 2019; ePub(ePub): ePub.

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10.1007/s00198-019-04943-6

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30937483

Abstract

Little is known about post-acute care following hip fracture surgery. We investigated discharge destinations from surgical hospitals for nine Canadian provinces. We identified significant heterogeneity in discharge patterns across provinces suggesting different post-acute recovery pathways. Further work is required to determine the impact on patient outcomes and health system costs.

INTRODUCTION: To examine discharge destinations by provinces in Canada, adjusting for patient, injury, and care characteristics.

METHODS: We analyzed population-based hospital discharge abstracts from a national administrative database for community-dwelling patients who underwent hip fracture surgery between 2004 and 2012 in Canada. Discharge destination was categorized as rehabilitation, home, acute care, and continuing care. Multinomial logistic regression modeling compared proportions of discharge to rehabilitation, acute care, and continuing care versus home between each province and Ontario. Adjusted risk differences and risk ratios were estimated.

RESULTS: Of 111,952 previously community-dwelling patients aged 65 years or older, 22.5% were discharged to rehabilitation, 31.6% to home, 27.0% to acute care, and 18.2% to continuing care, with significant variation across provinces ($p < 0.001$). The proportion of discharge to rehabilitation ranged from 2.4% in British Columbia to 41.0% in Ontario while the proportion discharged home ranged from 20.3% in Prince Edward Island to 52.2% in British Columbia. The proportion of discharge to acute care ranged from 15.2% in Ontario to 58.8% in Saskatchewan while the proportion discharged to continuing care ranged from 9.3% in Manitoba and Prince Edward Island to 22.9% in New Brunswick. Adjusting for hospital type changed the direction of the provincial effect on discharge to continuing care in two provinces, but statistical significance remained consistent with the primary analysis.

CONCLUSIONS: Discharge destination from the surgical hospital after hip fracture is highly variable across nine Canadian provinces. Further work is required to determine the impact of this heterogeneity on patient outcomes and health system costs.

Language: en

Keywords

Discharge destination; Health services research; Hip fracture; Variation

Effectiveness of cardiovascular evaluations and interventions on fall risk: a scoping review

Luiting S, Jansen S, Seppala LJ, Daams JG, van der Velde N. J. *Nutr. Health Aging* 2019; 23(4): 330-337.

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30932131

Abstract

OBJECTIVE: Cardiovascular abnormalities are consistently associated with fall risk in older people. However, little research has been done to assess the effect of cardiovascular interventions on fall risk. The aim of this scoping review is to explore the current literature on the effectiveness of cardiovascular evaluations and interventions in reducing fall risk in older people.

DESIGN: Scoping review. **DATA SOURCES:** Medline, Cochrane Library, and WHO ICTRP Search Portal were systematically searched. **SELECTION CRITERIA:** Randomized controlled trials (RCTs) and intervention studies of community-dwelling adults aged ≥ 50 years or with a mean age of >60 years that assessed the effect of a cardiovascular assessment and interventions in reducing fall risk. Key search concepts were "falls" and "aged", and terms for different cardiovascular evaluations and interventions were included. The Cochrane Checklist for risk of bias and the ROBINS-I tool were used to assess the quality of the studies.

RESULTS: Seven studies were included. The majority showed a reduction in falls after cardiovascular evaluation and intervention. Two out of four studies that focused on carotid sinus hypersensitivity (CSH) as a modifiable cardiovascular risk factor for falls, showed a significant reduction in falls after pacemaker implantation. Two studies that looked at sinus node dysfunction (SND) both showed a significant reduction in falls after pacemaker implantation. One study showed that 33% of the patients experienced a fall after cardiovascular evaluation and intervention, whereas all patients fell before assessment.

CONCLUSIONS: The majority of the included studies showed a reduction in falls after the intervention. However, the number of published papers regarding the effect of cardiovascular assessment and interventions on falls is small. A standardized assessment of cardiovascular risk factors may be essential in preventing falls in older adults and could consequently reduce injuries, loss of quality of life, deaths, and fall-related expenditures.

Language: en

Keywords

Aged; cardiovascular; evaluations; falls; interventions

Effectiveness of falls prevention intervention programme in community-dwelling older people in Thailand: randomized controlled trial

Suttanon P, Piriyaprasarth P, Krootnark K, Aranyavalai T. Hong Kong Physiother. J. 2018; 38(1): 1-11.

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DOI

10.1142/S1013702518500014

PMID

30930574

PMCID

PMC6385548

Abstract

BACKGROUND: Although there is extensive research on falls prevention, most of this knowledge is from western countries, and this may limit its usefulness when implementing in countries with different culture and healthcare systems.

OBJECTIVE: This study evaluated the feasibility and effectiveness of a falls prevention intervention programme for older people in Thailand.

METHODS: Two hundred and seventy-seven community-dwelling older people were randomized to either an intervention programme which included an education about falls risk management plus a home-based balance exercise delivered by a physiotherapist for four-month duration or control group. Falls, balance, physical activity, and other falls risk factors were measured at baseline and after programme completion.

RESULTS: About 90% of the participants in the intervention group completed the programme, with very high adherence to the exercise programme, though poor compliance with the suggestions of other falls risks management. There were no falls or injuries related to the exercise programme reported. There was no significant difference in falls rate between the two groups.

CONCLUSION: This falls prevention program was not effective in reducing falls in community-dwelling older people in Thailand. However, the study provided encouraging evidence that home-based balance exercise could be practically implemented in older people living in communities in Thailand.

Language: en

Keywords

Exercise; Thailand; falls prevention; older people

Falls risk classification of older adults using deep neural networks and transfer learning

Martinez MT, De Leon P. IEEE J. Biomed. Health Inform. 2019; ePub(ePub): ePub.

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DOI: 10.1109/JBHI.2019.2906499

PMID: 30932855

Abstract

Prior research in falls risk classification using inertial sensors has relied on the use of engineered features, which has resulted in a feature space containing hundreds of features that are likely redundant and possibly irrelevant. In this paper, we propose using fully convolutional neural networks (FCNNs) to classify older adults at low or high risk of falling using inertial sensor data collected from a smartphone. Due to the limited nature of older adult inertial gait data sets, we first pre-train the FCNN models using a publicly available data set for pedestrian activity recognition. Then via transfer learning, we train the network for falls risk classification. We show that via transfer learning, our falls risk classifier obtains an area under the receiver operating characteristic curve of 93.3%, which is 10.6% higher than the equivalent model trained without the use of transfer learning. Additionally, we show that our method outperforms other standard machine learning classifiers trained on features developed in prior research.

Language: en

Falls, footwear, and podiatric interventions in older adults

Hatton AL, Rome K. Clin. Geriatr. Med. 2019; 35(2): 161-171.

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PMID

30929880

Abstract

Footwear is a modifiable risk factor for falls in older adults, including populations with metabolic disease, inflammatory arthritis, and neurodegenerative disease. Ill-fitting footwear, and specific design features, such as elevated heels and backless styles, can impair balance control and heighten the risk of falling. Although foot care is routine practice for some older adults to prevent ulceration (eg, diabetes) or relieve symptoms (eg, foot pain), new footwear interventions are emerging with the potential to ameliorate balance and walking impairments. Multifaceted podiatric interventions, which include appropriate footwear and importantly patient education, may have the capacity to reduce falls in older adults.

Language: en

Keywords

Balance; Falls; Footwear; Gait; Older adults; Podiatry; Shoe insoles

Geriatric polypharmacy: pharmacist as key facilitator in assessing for falls risk: 2019 update

Fritsch MA, Shelton PS. Clin. Geriatr. Med. 2019; 35(2): 185-204.

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(Copyright © 2019, Elsevier Publishing)

DOI

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PMID

30929882

Abstract

This article highlights the significant health impact of falls among older adults. An emphasis is placed on the vital role of the pharmacist, regardless of practice setting, in assessing and reducing falls risk for this growing population. In addition, the importance of a stepwise comprehensive approach to falls assessment by pharmacists in collaboration with other clinicians is elucidated.

Language: en

Keywords

Falls; Falls assessment; Geriatric; Medication; Patient safety; Pharmacist

Multicentre, randomised controlled trial of PDSAFE, a physiotherapist-delivered fall prevention programme for people with Parkinson's

Chivers Seymour K, Pickering R, Rochester L, Roberts HC, Ballinger C, Hulbert S, Kunkel D, Marian IR, Fitton C, McIntosh E, Goodwin VA, Nieuwboer A, Lamb SE, Ashburn A. J. Neurol. Neurosurg. Psychiatry 2019; ePub(ePub): ePub.

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DOI

10.1136/jnnp-2018-319448

PMID

30944149

Abstract

OBJECTIVE: To estimate the effect of a physiotherapist-delivered fall prevention programme for people with Parkinson's (PwP).

METHODS: People at risk of falls with confirmed Parkinson's were recruited to this multicentre, pragmatic, investigator blind, individually randomised controlled trial with prespecified subgroup analyses. 474 PwP (Hoehn and Yahr 1-4) were randomised: 238 allocated to a physiotherapy programme and 236 to control. All participants had routine care; the control group received a DVD about Parkinson's and single advice session at trial completion. The intervention group (PDSAFE) had an individually tailored, progressive home-based fall avoidance strategy training programme with

balance and strengthening exercises. The primary outcome was risk of repeat falling, collected by self-report monthly diaries, 0-6 months after randomisation. Secondary outcomes included Mini-BESTest for balance, chair stand test, falls efficacy, freezing of gait, health-related quality of life (EuroQol EQ-5D), Geriatric Depression Scale, Physical Activity Scale for the Elderly and Parkinson's Disease Questionnaire, fractures and rate of near falling.

RESULTS: Average age is 72 years and 266 (56%) were men. By 6 months, 116 (55%) of the control group and 125 (61.5%) of the intervention group reported repeat falls (controlled OR 1.21, 95% CI 0.74 to 1.98, $p=0.447$). Secondary subgroup analyses suggested a different response to the intervention between moderate and severe disease severity groups. Balance, falls efficacy and chair stand time improved with near falls reduced in the intervention arm.

CONCLUSION: PDSAFE did not reduce falling in this pragmatic trial of PwP. Other functional tasks improved and reduced fall rates were apparent among those with moderate disease. TRIAL REGISTRATION NUMBER: ISRCTN48152791.

Language: en

Keywords

Cognition; Disease severity; Fall prevention; Freezing of gait; Parkinson's; Physiotherapy

Older adult falls in emergency medicine: 2019 update

Carpenter CR, Cameron A, Ganz DA, Liu S. Clin. Geriatr. Med. 2019; 35(2): 205-219.

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30929883

Abstract

"Standing-level falls represent the most frequent cause of trauma-related death in older adults and a common emergency department (ED) presentation. However, these patients rarely receive guideline-directed screening and interventions during or following an episode of care. Reducing injurious falls in an aging society begins with prehospital evaluations and continues through definitive risk assessments and interventions that usually occur after ED care. Although ongoing obstacles to ED-initiated, evidence-based older adult fall-reduction strategies include the absence of a compelling emergency medicine evidence basis, innovations under way include validation of pragmatic screening instruments and incorporation of contemporary technology to improve fall detection rates."

Language: en

Keywords: Accidental fall; Emergency department; Emergency medical services; Geriatric; Implementation; Trauma

Optimizing function and physical activity in hospitalized older adults to prevent functional decline and falls

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DOI

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PMID

30929885

Abstract

Physical activity, defined as bodily movement that expends energy including such things as bed mobility, transfers, bathing, dressing, and walking, has a positive impact on physical and psychosocial outcomes among older adults during their hospitalization and the post hospitalization recovery period. Despite benefits, physical activity is not the focus of care in the acute care setting. Further there are many barriers to engaging patients in physical activity and fall prevention activities including patient, family and provider beliefs, environmental challenges and limitations, hospital policies, and medical and nursing interventions. This paper provides an overview of falls and physical activity prevalence among acute care patients, challenges to engaging patients in physical activity and falls prevention activities and innovative approaches to increase physical activity and prevent falls among older hospitalized patients.

Language: en

Keywords

Falls; Functional decline; Hospitalized older adults; Optimizing function; Optimizing physical activity

Outcomes of patient-engaged video surveillance on falls and other adverse events

Quigley PA, Votruba L, Kaminski J. Clin. Geriatr. Med. 2019; 35(2): 253-263.

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PMID

30929886

Abstract

Patient-engaged video surveillance implemented in 71 hospitals over 1 year revealed low rates in assisted and unassisted falls, room elopement, and line, tube, or drain dislodgement per 1000 days of surveillance. Monitor technicians interacted 20.5 times per day with patients who fell and initiated alarms for urgent unit staff response 2.38 times per day, and this accounted for the low fall rate (1.50 falls/1000 days of surveillance) in an adult population. Data on adverse events and timeliness of nursing response to actual urgent and emergent patient conditions provides evidence of the rapid contribution of patient-engaged video surveillance to patient safety.

Language: en

Keywords

Fall prevention; Falls; Outcomes; Patient engagement; Surveillance; TeleSitting

Personality and falls among older adults: evidence from a longitudinal cohort

Canada B, Stephan Y, Sutin A, Terracciano A. J. Gerontol. B Psychol. Sci. Soc. Sci. 2019; ePub(ePub): ePub.

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DOI

10.1093/geronb/gbz040

PMID

30945733

Abstract

OBJECTIVES: Falls can have catastrophic consequences, especially for older adults. The present study examined whether personality traits predict the incidence of falls in older age.

METHOD: Participants were older adults aged from 65 to 99 years (N = 4,759) drawn from the Health and Retirement Study. Personality traits and demographic factors were assessed at baseline. Falls were tracked for up to 11 years.

RESULTS: Over the follow-up period, 2,811 individuals reported falls. Cox regression analyses that included demographic covariates indicated that lower conscientiousness and higher neuroticism increased the risk of falling. Disease burden, depressive symptoms, and physical inactivity mediated the associations between both traits and falls incidence, whereas smoking status and handgrip strength mediated the neuroticism-falls incidence association.

DISCUSSION: This study provides new prospective evidence that personality predicts the incidence of falls in older adults and suggest that personality assessment may help identifying individuals at higher risk of falling.

Language: en

Keywords

conscientiousness; functional limitation; neuroticism

Preventing falls in hospitalized patients: state of the science

LeLaurin JH, Shorr RI. Clin. Geriatr. Med. 2019; 35(2): 273-283.

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30929888

Abstract

Falls in hospitalized patients are a pressing patient safety concern, but there is a limited body of evidence demonstrating the effectiveness of commonly used fall prevention interventions in hospitals. This article reviews common study designs and the evidence for various hospital fall prevention interventions. There is a need for more rigorous research on fall prevention in the hospital setting.

Language: en

Keywords

Accidental falls; Aged; Alarms; Hospitals; Nursing; Prevention; Restraints

Secondary prevention of minor trauma fractures: the effects of a tailored intervention-an observational study

van der Vet PCR, Kusen JQ, Rohner-Spengler M, Link BC, Houwert RM, Babst R, Henzen C, Schmid L, Beeres FJP. Arch. Osteoporos.2019; 14(1): e44.

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Abstract

INTRODUCTION: Minor trauma fractures (MTF) in the elderly are associated with an increase in mortality, morbidity, and the risk of subsequent fractures. Often, these patients who sustain MTF have an underlying bone disease, such as osteopenia or osteoporosis. Osteoporosis is known to be underdiagnosed and undertreated, and adequate treatment is essential to reduce the occurrence of MTFs. At our hospital, this has led to the implementation of Osteofit, a patient-education-based intervention targeted at improving screening and prevention of osteoporosis, with the goal to reduce the rate of subsequent MTF.

OBJECTIVE: The aim of this study was to assess the efficacy of Osteofit in improving osteoporosis screening and treatment in patients after an initial MTF episode.

METHODS: The study is a prospective, single-center, cohort study of MTF patients aged 50 years or older. A standardized questionnaire and telephone interview were used to collect 1-year follow-up data. The primary outcome was the rate of patients undergoing Dual X-ray Absorptiometry (DXA) scanning. Secondary outcomes were the rate of patients with a diagnosis of osteoporosis or osteopenia, the rate of patients treated with anti-osteoporotic medication, and the rate of patients with a subsequent fracture. DXA scanning rate, the prevalence of a diagnosis (osteoporosis/osteopenia), and data on medical treatment for osteoporosis were compared to the results of a previous study in the same hospital, published in 2004.

RESULTS: Between 2012 and 2015, 411 of 823 eligible patients consented to participate and were included in this study. The mean age was 72 ± 9.3 years. Sixty-three percent (63.3%, $n = 252$) of the patients received a DXA scan, compared to 12.6% reported in our previous study. Of all patients who received a DXA scan, 199 (82.9%) were diagnosed with osteoporosis or osteopenia. A total of 95 patients (23.1%) received specific medical treatment for osteoporosis and 59.8% reported the intake of any unspecific medication (vitamin D, calcium, or both). Fifteen patients (3.9%) had a subsequent fracture as a result of a minor trauma fall.

CONCLUSION: The implementation of a MTF secondary prevention program with dedicated health professionals improved the rate of patients who underwent DXA screening by fivefold. Despite this improvement, DXA screening was missed in over a third of patients, with only 23% of eligible patients receiving specific medical treatment for osteoporosis at 1-year follow-up. Consequently, this tailored intervention is a promising first step in improving geriatric fracture care. However, further work to improve the rate of osteoporosis screening and medical treatment initiation for the long-term prevention of subsequent MTF is recommended. We believe osteoporosis screening and adequate osteoporosis medication should be integrated as standard procedure in the aftercare of MTF. LEVEL OF EVIDENCE: II.

Keywords

Fracture; Osteopenia; Osteoporosis; Secondary prevention

The Beers criteria: not just for geriatrics anymore? Analysis of Beers criteria medications in non-geriatric trauma patients and their association with falls

Maerz AH, Walker BS, Collier BR, Tegge AN, Faulks ER, Bower KL, Nussbaum MS, Lollar DI, Hamill ME. J. Trauma Acute Care Surg.2019; ePub(ePub): ePub.

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PMID

30939582

Abstract

BACKGROUND: It has been well established that many classes of medications on the Beers list of Potentially Inappropriate Medications (PIMs) are associated with falls and injuries in the geriatric population, but little work has been done to understand if similar relationships exist among the non-geriatric adult population.

METHODS: A retrospective chart review of 32 months of trauma encounters at our level 1 trauma center was performed in non-geriatric adults ages 18-64. Encounters were reviewed by mechanism of injury and intake medication reconciliation. The data was then evaluated for associations between PIMs and falls.

RESULTS: Of the 7897 trauma encounters in the study period 6493 had completed medication reconciliation and 4154 were between the ages of 18 and 64. There was a statistically significant disproportionate number of those who sustained a fall on psychoactive medications and proton pump inhibitors, and the odds of a trauma patient presenting as a fall were also significantly higher on these select classes of PIMs **CONCLUSIONS:** PIMs associated with falls in the geriatric population are also associated with falls in the non-geriatric population. This study supports the judicious prescribing of these medications, as they may have risks beyond what was originally thought. **LEVEL OF EVIDENCE:** IV, prognostic.

Language: en

The overlap between falls and delirium in hospitalized older adults: a systematic review

Sillner AY, Holle CL, Rudolph JL. Clin. Geriatr. Med. 2019; 35(2): 221-236.

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30929884

Abstract

Falls frequently occur in persons with cognitive impairment, including delirium. This article presents a systematic review of the association between falls and delirium in adults aged 65 years or older. For the studies that compared falls and delirium, the risk ratio was consistently elevated (median RR 4.5, range 1.4-12.6) and statistically significant in all but one study. These results suggest that falls and delirium are inextricably linked. There is a need to further refine fall risk assessment tools and protocols to specifically include delirium for consideration as a risk factor that needs additional assessment and management.

Language: en

Keywords

Delirium; Falls; Hospital; Older adults; Systematic review

The reliability and validity of the Survey of Activities and Fear of Falling in the Elderly for assessing fear and activity avoidance among stroke survivors

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PMID

30934022

Abstract

INTRODUCTION: Activity restriction due to fear of falling is a common problem after a stroke. It can lead to deteriorated physical condition, restricted social participation and deprived quality of life. The Survey of Activities and Fear of Falling in the Elderly (SAFE) was developed to assess these difficulties, and its utility has been demonstrated among the older adults and older people with Parkinson's disease. This study aimed to expand those demonstrations to community-dwelling chronic stroke survivors using a Chinese translation of the instrument.

METHODS: One hundred and eight elderly individuals with a history of stroke completed the Chinese version of the SAFE (SAFE-C). The internal consistency of their responses was assessed using Cronbach's alpha. Twenty of the same subjects were reassessed after a 1-week interval to assess the instrument's test-retest reliability. Structure validity was examined by exploratory factor analysis. Pearson correlation was used to establish the instrument's convergent validity with respect to the results from the Chinese version of the Activities-specific Balance Confidence Scale (ABC-C) and the Chinese version of the Lawton Instrumental Activities of Daily Living scale (IADL-C).

RESULTS: The items of the SAFE-C demonstrated excellent internal consistency with a Cronbach's alphas of 0.90. The SAFE-C also had excellent test-retest reliability with an overall intra-class correlaton coefficient of 0.91. A 1-factor structure termed "fear avoidance circumstances" was identified and it was shown to be consistent with the original measure developed among community-living older people. The correlations between the SAFE-C and the ABC-C ($r = -0.68$) and the IADL-C ($r = -0.57$) confirmed the convergent validity.

CONCLUSIONS: Fear avoidance behavior is a homogeneous construct applicable to people with stroke-specific impairments alike. The SAFE-C is a reliable and valid instrument for measuring the level of fear avoidance behavior among community-dwelling stroke survivors. Stroke survivors with good functional mobility revealed a low level of fear and avoidance as measured by the SAFE-C.

Hypoglycemia and hyperglycemia are risk factors for falls in the hospital population

Berra C, De Fazio F, Azzolini E, Albini M, Zangrandi F, Mirani M, Garbossa S, Guardado-Mendoza R, Condorelli G, Folli F. *Acta Diabetol.* 2019; ePub(ePub): ePub.

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30929079

Abstract

OBJECTIVE: To determine the role of hypoglycemia, hyperglycemia or the combination of both as independent risk factors for falls in a hospital population. Secondary objectives included evaluation of other risk factors for falling and their relationships with glucose levels. **RESEARCH DESIGN AND METHODS:** Retrospective cohort study over 2 years on hospitalized subjects (N = 57411) analyzing in-hospital-falls and capillary glucose values. Bivariate analysis (χ^2 test) and multivariate analysis (logistic regression) were performed to test for correlation of glucose values, age, sex, Charlson index, service of care, diagnosis at discharge and diabetes treatment with risk of in-hospital-falls.

RESULTS: The comparison of patients who experienced a fall (fall population) with the non-fall population suggested that: glucose determinations were significantly more frequent in the fall population (OR 3.45; CI 2.98-3.99; $p < 0.0001$); values of glucose below 70 mg/dl and over 200 mg/dl were significantly associated to falls during hospitalization (OR 1.76; CI 1.42-2.19; $p < 0.001$) as compared to glycemic values between 70 and 200 mg/dl; diabetes treatment was significantly correlated to risk of fall (OR 2.97; CI 2.54-3.49; $p < 0.001$); the frequency of glycemia measurements below 70 mg/dl and over 200 mg/dl in the same subject was significantly associated to falls during hospitalization (OR 1.01; CI 1.01-1.02; $p < 0.001$).

CONCLUSION: Hypoglycemia and hyperglycemia during hospital stays are correlated with an increased risk for falls in the hospitalized population. Presence of diabetes, use of insulin or glucose variability could potentially constitute risk factors for falls inside the hospital as well.

Language: en

Keywords

Diabetes; Falls; Glucose variability; Hyperglycemia; Hypoglycemia; Hypoglycemic agents; In-hospital; Insulin

Risk factors for falls in individuals with lower extremity amputations during the pre-prosthetic phase: a retrospective cohort study

Vu K, Payne MWC, Hunter SW, Viana R. PM R 2018; ePub(ePub): ePub.

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30934158

Abstract

BACKGROUND: Falls in individuals with lower limb amputations (LLAs) pose significant health concerns. The literature is limited regarding falls during the preprosthetic phase of rehabilitation for persons with LLAs.

OBJECTIVE: To determine the incidence of falls and identify factors associated with falls during the preprosthetic recovery phase.

DESIGN: Retrospective chart audit. **SETTING:** Inpatient rehabilitation program. **PARTICIPANTS:** Four hundred forty individuals with LLAs (age \pm SD = 61.93 \pm 14.53 years, 73.18% male) who attended inpatient rehabilitation from 26 July 2011 to 21 August 2017. **INTERVENTIONS:** Not applicable. **MAIN OUTCOME MEASUREMENTS:** The number of self-reported falls was recorded from the time of surgery to admission for inpatient rehabilitation. Outcomes of interest were any fall (1+ fall) and recurrent falls (2+ falls). A retrospective chart audit was performed on consecutive admissions to an inpatient rehabilitation program.

RESULTS: The incidence of falls was 8.37 per 1000 patient-days. Falls were sustained by 60.9% of the sample. Unilateral transtibial amputation was independently associated with an increased risk of recurrent falls (relative risk [RR] 1.59, 95% confidence interval [CI] 1.13-2.23, $P = .008$). Diabetes mellitus was independently associated with an increased risk of any fall (RR 1.18, 95% CI 1.01-.38, $P = .03$). Finally, bilateral transtibial amputation was independently associated with a reduced risk of any fall (RR 0.59, 95% CI 0.39-0.90, $P = .014$).

CONCLUSIONS: Consistent with the current literature, diabetes mellitus and a unilateral transtibial amputation were risk factors for falling, whereas a bilateral transtibial amputation and increasing age presented new findings as factors associated with decreased falling. **LEVEL OF EVIDENCE:** III.

Language: en

Smart seismic sensing for indoor fall detection, location and notification

Clemente J, Li F, Valero M, Song W. *IEEE J. Biomed. Health Inform.* 2019; ePub(ePub): ePub.
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PMID

30946684

Abstract

This paper presents a novel real-time smart system performing fall detection, location, and notification based on floor vibration data produced by fall downs. Only using floor vibration as the recognition source, the system incorporates a person identification through vibration produced by footsteps to inform who is the fallen person. Our approach operates in a real-time style, which means the system recognizes a fall immediately and can identify a person with only one or two footsteps. A collaborative in-network location method is used in which sensors collaborate with each other to recognize the person walking, and more importantly, detect if the person falls down at any moment. We also introduce a voting system among sensor nodes to improve person identification accuracy. Our system is robust to identify fall downs from other possible similar events, like jumps, door close, objects fall down, etc. Such a smart system can also be connected to smart commercial devices (Google Home or Amazon Alexa) for emergency notifications. Our approach represents an advance in smart technology for elder people who live alone. Evaluation of the system shows it is able to detect fall downs with an acceptance rate of 95.14% (distinguishing from other possible events), and it identifies people with one or two steps in a 97.22% (higher accuracy than other methods that use more footsteps). The fall down location error is smaller than 0.27 meters, which it is acceptable compared to the height of a person.

Vitamin D does not prevent fractures and falls

Heneghan C, Mahtani KR. *BMJ Evid. Based Med.* 2019; ePub(ePub): ePub.

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PMID

30944101

Abstract

Current evidence does not justify routinely recommending vitamin D supplements to prevent fractures or falls in adults.

Language: en

Keywords

nutritional support; preventive medicine