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A multimodal training modulates short-afferent inhibition and improves complex walking in a cohort of faller older adults with an increased prevalence of Parkinson's disease

Pelosin E, Cerulli C, Ogliastro C, Lagravinese G, Mori L, Bonassi G, Mirelman A, Hausdorff JM, Abbruzzese G, Marchese R, Avanzino L. J. Gerontol. A Biol. Sci. Med. Sci. 2019; ePub(ePub): ePub.

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Abstract

BACKGROUND: Falls are frequent in Parkinson's disease and ageing. Impairments in the cholinergic-mediated attentional supervision of gait may contribute to increased fall risk, especially when obstacles challenge gait. Interventions combining motor-cognitive approaches have been shown to improve motor performance, cognitive skills and falls number. Here, we hypothesized that an intervention simulating an attention-demanding walking condition could impact not only complex gait performance and fall risk but also short-latency afferent inhibition (SAI), as a marker of cholinergic activity.

METHODS: Thirty-nine participants at falls risk (24 Parkinson's disease subjects and 15 older adults) were recruited in a randomized controlled trial. Participants were assigned to treadmill training or treadmill training with non-immersive virtual reality intervention and trained 3 times a week for 6 weeks. SAI, a transcranial magnetic stimulation paradigm, was used to assess cholinergic activity. Gait kinematics was measured during usual walking and while negotiating physical obstacles. Transcranial magnetic stimulation and gait assessments were performed pre, post, and 6 months post intervention.

RESULTS: Treadmill training combined with non-immersive virtual reality induced an increase in inhibition of the SAI protocol on cortical excitability, improved obstacle negotiation performance and induced a reduction of the number of falls compared to treadmill training. Furthermore, the more SAI increased after training, the more the obstacle negotiation performance improved and fall rate decreased.

Language: en

Keywords

Ageing; Parkinson; afferent inhibition; cholinergic system; falls; treadmill training; virtual reality

Addressing balance, mobility and falls: are we moving the needle on fall prevention?

Hicks GE. J. Gerontol. A Biol. Sci. Med. Sci. 2019; ePub(ePub): ePub.

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30892593

Abstract

[Abstract unavailable]

While the problem of falls in the geriatric population is enormously challenging, the thoughtful studies published in this issue of the journal move the needle in a positive direction. But, what should happen next with the interventions that show promise? Given that the ultimate goal is to reduce fall rates amongst older adults in the broader community, interventionists should consider the principles of implementation science from the outset and focus on developing an intervention approach that can be successfully utilized by the people who need it (i.e. older adults at high risk of falling) in the places where they live (i.e. suburbs, inner city, nursing home).

To keep the end goal of implementation in mind during the early stages of intervention development and efficacy testing is a daunting task, but it is necessary if we are to really move the needle. Focused and sustained scientific leadership in falls research from our gerontological community is required if we hope to truly reduce fall rates in our communities, as well as the physical, psychological and financial costs associated with this serious problem.

Language: en

Clinical pharmacist involvement in fall management in a polymorbid geriatric patient with a history of recurrent falls

Doseděl M, Malý J, Vosátka J, Mikolášek P, Brabcová I, Hajduchová H, Bártlová S, Tóthová V, Vlček J. *Ceska Slov. Farm.* 2019; 67(5-6): 205-211.

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30871326

Abstract

Patient falls represent a significant burden on healthcare facilities, particularly by prolonging hospitalization and increasing the cost of subsequent healthcare. In most cases, fall is caused by a combination of several modifiable and unmodifiable risk factors. The pharmacotherapy, which is often unreasonably administered in relation to patient health condition and drug combination, belongs among the modifiable risk factors. In this case report, the potential effect of pharmacotherapy on the patient fall-related risk as well as clinical pharmacy service that can contribute to reducing the risk of falls by engaging of clinical pharmacist in a multidisciplinary team with focus on the risks of pharmacotherapy and their management are shown.

Language: en

Keywords

clinical pharmacist; fall; fall risk increasing drugs (FRIDs)

Differences and overlap between sarcopenia and physical frailty in older community-dwelling Japanese

Mori H, Tokuda Y. *Asia Pac. J. Clin. Nutr.* 2019; 28(1): 157-165.

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DOI

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PMID

30896427

Abstract

BACKGROUND AND OBJECTIVES: Sarcopenia and frailty result in loss of function and independence. Sarcopenia may be a risk factor for frailty; however, risk factors for sarcopenia with frailty, and associated incidence of falls and poor quality of life remain unclear. We investigated the clinical characteristics and relevant factors for sarcopenia with frailty in older community-dwelling Japanese.

METHODS AND STUDY DESIGN: This cross-sectional study included 331 Japanese community-dwelling adults aged ≥ 60 years. We assessed falls history in the past year, health-related quality of life (HRQOL), including physical component summary (PCS) and mental component summary (MCS), age, total energy intake per ideal body weight (TEI/kg IBW), total protein intake/kg IBW, vitamin D intake, and exercise habits. Sarcopenia was determined using low hand grip strength or slow gait speed and low skeletal muscle mass index. Frailty was determined if ≥ 3 components, such as unintended weight loss, exhaustion, low muscle strength, slow gait speed, and low physical activity were present.

RESULTS: The prevalence of sarcopenia with frailty was 3.6%; such participants had a higher risk of recurrent falls and lower PCS and MCS scores than robust participants. Age, TEI/kg IBW, total protein intake/kg IBW, and vitamin D intake were significantly associated with risk of sarcopenia with frailty by multivariate logistic regression analysis.

CONCLUSIONS: This study showed that sarcopenia with frailty was had higher incidences of recurrent fall and poor HRQOL than robust older adults. Aging and poor energy, protein, and vitamin D intake, may be relevant factors for sarcopenia with frailty.

Language: en

Effect of walking speed on the intersegmental coordination of lower-limb segments in elderly adults

Dewolf AH, Meurisse GM, Schepens B, Willems PA. *Gait Posture* 2019; 70: 156-161.

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DOI

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30875602

Abstract

BACKGROUND: Ageing brings profound changes in walking gait. For example, older adults reduce the modification of pelvic and trunk kinematics with walking speed. However, the modification of the coordination between lower-limb segments with age has never been investigated across various controlled speeds. **RESEARCH QUESTION:** Is the effect of speed on the intersegmental coordination different between elderly and young adults? **METHODS:** Nineteen senior and eight young adults walked on a treadmill at speeds ranging from 0.56 to 1.94 m s⁻¹. The motion of the lower-limb segments in the sagittal plane was recorded by cinematography. When the angles of the thigh, shank and foot during a stride are plotted one versus the other, they describe loops constraint on a plane. The coordination between lower-limb segments was thus evaluated by performing a principal component analysis between the thigh, shank and foot elevation angles. The effect of speed and age on the intersegmental coordination was examined using a two-level linear mixed model ANOVA.

RESULTS: In both age groups the orientation of the plane changes with speed, due to a more in-phase shank and foot motion. However, the effect of speed on the covariation plane is lessened with age. **SIGNIFICANCE:** Our results demonstrate that there is an age-related specific adjustment of the intersegmental coordination to speed. In particular, older adults restrict their repertoire of angular segment motion. These differences in coordination are mainly related to different foot-shank coordination.

Language: en

Keywords

Ageing; Coplanar variation; Lower limb coordination

Exploring purpose-designed audio-visual falls prevention messages on older people's capability and motivation to prevent falls

de Jong LD, Lavender AP, Wortham C, Skelton DA, Haines TP, Hill AM. Health Soc. Care Community 2019; ePub(ePub): ePub.

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Abstract

The number of falls and fall-associated injury rates among older people continues to rise worldwide. Increased efforts to influence older people's falls prevention behaviour are needed. A two-phase exploratory community-based participatory study was conducted in Western Australia. First, three prototype audio-visual (AV) falls prevention messages were designed collaboratively with six older people. Second, the messages' effect on community-dwelling older people's knowledge, awareness and motivation to take action regarding falls prevention was explored using focus groups. Data were analysed using thematic analysis to explore participants' responses to the messages. The participants' (n = 54) perspectives on the AV messages varied widely and stereotypes of ageing appeared to influence these. The presented falls facts (including falls epidemiology statistics) increased some participants' falls risk awareness and falls prevention knowledge. Other participants felt ready-to-use falls prevention information was lacking. Some expressed positive emotions or a personal connection to the messages and suggested the messages helped reduce ageing-related stigma. Strongly opposing viewpoints suggested that other participants identified implicit negative messages about ageing, which reduced their motivation with the messages. Suggestions to improve the message persuasiveness included adding more drama and tailoring messages to appeal to multiple age groups. Overall, the AV falls prevention messages designed in collaboration with older people elicited a divergent range of positive and negative perspectives from their peers, which was conceptualised by the overarching theme 'we all look at things different ways'. Opinions differed regarding whether the messages would appeal to older people. Public campaigns targeting falls prevention should be designed and tailored towards older peoples' differing perspectives about ageing.

Language: en

Keywords

accidental falls; community-based participatory research; consumer health information; health behaviour; qualitative research

Fall ascertainment and development of a risk prediction model using electronic medical records

Oshiro CES, Frankland TB, Rosales AG, Perrin NA, Bell CL, Lo SHY, Trinacty CM. *J. Am. Geriatr. Soc.* 2019; ePub(ePub): ePub.

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Abstract

OBJECTIVES: To examine the use of electronic medical record (EMR) data to ascertain falls and develop a fall risk prediction model in an older population.

DESIGN: Retrospective longitudinal study using 10 years of EMR data (2004-2014). A series of 3-year cohorts included members continuously enrolled for a minimum of 3 years, requiring 2 years pre-fall (no previous record of a fall) and a 1-year fall risk period. **SETTING:** Kaiser Permanente Hawaii, an ambulatory setting. **PARTICIPANTS:** A total of 57 678 adults, age 60 years and older. **MEASUREMENTS:** Initial EMR searches were guided by current literature and geriatricians to understand coding sources of falls as our outcome. Falls were captured by two coding sources: International Classification of Diseases, Ninth Revision (ICD-9) codes (E880-889) and/or a fall listed as a "primary reason for visit." A comprehensive list of EMR predictors of falls were included into prediction models enabling statistical subset selection from many variables and modeling by logistic regression.

RESULTS: Although 72% of falls in the training data set were coded as "primary reason for visit," 22% of falls were coded as ICD-9 and 6% coded as both. About 80% were reported in face-to-face encounters (eg, emergency department). A total of 2164 individuals had a fall in the risk period. Using the 13 key predictors (age, comorbidities, female sex, other mental disorder, walking issues, Parkinson's disease, urinary incontinence, depression, polypharmacy, psychotropic and anticonvulsant medications, osteoarthritis, osteoporosis) identified through LASSO regression, the final model had a sensitivity of 67%, specificity of 69%, positive predictive value of 8%, negative predictive value of 98%, and area under the curve of .74.

CONCLUSION: This study demonstrated how the EMR can be used to ascertain falls and develop a fall risk prediction model with moderate sensitivity/specificity. Concurrent work with clinical providers to enhance fall documentation will improve the ability of the EMR to capture falls and consequently may improve the model to predict fall risk.

Keywords

EMR; adults; falls; risk



Fall prevention self-management among older adults: a systematic review

Schnock KO, P Howard E, Dykes PC. Am. J. Prev. Med. 2019; ePub(ePub): ePub.

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30885516

Abstract

CONTEXT: Adequate self-management could minimize the impact of falls in older adults. The efficacy of fall prevention self-management interventions has been widely studied, yet little is known about why some older adults engage in fall prevention self-management actions and behaviors, whereas others do not. Through a systematic review of fall prevention self-management studies, this study identified characteristics and the personal, social, and environmental factors of older adults who engage in self-management actions and behaviors. **EVIDENCE ACQUISITION:** Medical and nursing literature related to fall prevention self-management was searched in PubMed, Embase, and CINAHL (1997-2017), and relevant publications were selected by three researchers to assess whether the papers included subject characteristics and their fall prevention self-management actions and behaviors. **GRADE** (Grading of Recommendations, Assessment, Development and Evaluations) was used by the researchers to assess the quality of the included studies and to determine the significance of the extracted characteristics. **EVIDENCE SYNTHESIS:** Searching literature through 2017, a total of 972 papers were identified, and 28 papers remained after removing those that did not meet inclusion criteria. Nine papers that addressed subject characteristics in relation to the study outcomes were included in a sub-analysis. The authors identified the following characteristics of older adults who participated in fall prevention self-management actions and behaviors: younger males, not living alone and with self-reported good health, having greater fear of falling and high fall prevention self-efficacy, and possessing high motivation for engagement with self-management activities.

CONCLUSIONS: The systematic literature review revealed the personal characteristics of older adults who engage in fall prevention self-management actions and behaviors.

Language: en

Fall-related healthcare use and mortality among older adults in the Netherlands, 1997-2016

Olij BF, Panneman MJM, Van Beeck EF, Haagsma JA, Hartholt KA, Polinder S. *Exp. Gerontol.* 2019; ePub(ePub): ePub.

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Abstract

OBJECTIVES: Fall-related injuries are a leading cause of morbidity among older adults, leading to a high healthcare consumption and mortality. We aim to describe and quantify time trends of fall-related healthcare use and mortality among adults aged ≥ 65 years in the Netherlands, 1997-2016.

DESIGN: Data were extracted from the Dutch Injury Surveillance System, Dutch Hospital Discharge Registry, and Cause-of-Death Statistics Netherlands, by age, sex, diagnosis, injury location, and year. **MEASUREMENTS:** Absolute numbers and age-standardized rates of fall-related Emergency Department (ED) visits, hospital admissions, and fatalities, as well as average length of hospital stay (LOS) were calculated.

RESULTS: Between 1997 and 2016, absolute numbers of fall-related ED visits increased by 48%, hospital admissions increased by 59%, and mortality showed an almost threefold increase. These absolute numbers doubled among adults aged ≥ 85 years. A shift in fall-related injury diagnosis was observed over the years with a growing share of skull/brain injuries. In contrast to the increase in absolute numbers, standardized incidence rates of ED visits decreased by 30% ($p = 0.00$), whereas incidence rates of hospital admissions and mortality did not significantly change over time. Furthermore, the absolute number of hospital admission days almost halved, due to a reduced average LOS from 18.5 (95% confidence interval (CI): 18.2-18.8) days (1997) to 6.1 (95% CI, 6.1-6.2) days (2016).

CONCLUSION: Even though the standardized incidence rates of ED visits decreased in the past twenty years, the absolute number of fall-related ED visits increased. The number of hospital admissions has also increased, but the total number of admission days has almost halved during the same period. If the observed trends would continue, this may have implications for healthcare resource allocation, as the burden of care in EDs increases, and the admission duration reduces.

Language: en

Keywords

Accidental falls; Aged; Hospital departments

Food insecurity associated with self-reported falls among Medicare Advantage members

Mosen DM, Banegas MP, Friedman N, Shuster E, Brooks N. *Popul. Health Manag.* 2019; ePub(ePub): ePub.

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30897047

Abstract

More than 3 million older US adults injure themselves by falling each year. Falls are a major cause of morbidity and mortality for this population, and account for nearly \$30 billion in Medicare expenditures annually. Falls have been linked to frailty and vitamin D deficiency, both of which are linked to low nutrient intake and food insecurity. This retrospective, observational study is the first the authors know of to directly assess the relationship between food insecurity and falls. The study sample consisted of 26,525 Medicare Advantage members at Kaiser Permanente Northwest, a group model health maintenance organization, who had completed a quality of care survey between April 2013 and March 2017 and who maintained continuous enrollment in the 12 months prior to the survey date. Multivariable logistic regression analysis was used to assess the association between self-reported food insecurity and falls; electronic health record variables for age, sex, socioeconomic status, comorbidity, and health care utilization were included as covariates. Medicare Advantage members who reported food insecurity had 1.69 times higher odds of experiencing a fall in the past year than those without food insecurity, in adjusted analysis. Age, sex, comorbidity, and health care utilization also were significantly associated with falls. Food insecurity is significantly associated with falls among Medicare Advantage members. Routine assessment for food insecurity within the health care system, with subsequent referral to food resources, may help reduce rates of falls in older populations.

Language: en

Keywords

Medicare; falls; food insecurity

FRAILTOOLS study protocol: a comprehensive validation of frailty assessment tools to screen and diagnose frailty in different clinical and social settings and to provide instruments for integrated care in older adults

Checa-López M, Oviedo-Briones M, Pardo-Gómez A, Gonzales-Turín J, Guevara-Guevara T, Carnicero JA, Alamo-Ascencio S, Landi F, Cesari M, Grodzicki T, Rodríguez-Mañas L. *BMC Geriatr.* 2019; 19(1): e86.

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PMID: 30885132

Abstract

BACKGROUND: Dozens of scales and questionnaires have been used in the detection of frailty; however, a generalized method for its screening and diagnosis is still lacking in clinical settings. FRAILTOOLS' main objective is to evaluate the usefulness of frailty scales in the detection of frailty in different clinical and social settings, and its integration in management algorithms for the frail older patient.

METHODS: FRAILTOOLS is an observational, longitudinal and prospective study with a follow-up of 6, 12 and 18 months. People older than 75 years old will be recruited from three separate clinical settings (acute geriatric wards, geriatric outpatient clinics and primary care) and one social setting (nursing homes). Exclusion criteria include Mini-mental State Examination < 20 points, and a Barthel index < 90 points, except in nursing home residents (< 40 points). The participants will be recruited in Spain, Italy, France, United Kingdom and Poland. The total sample size will be of 1.940 subjects, 97 subjects in each clinical setting by center. A personal interview with each participant will take place to register data on comorbidity (Charlson Index), functional (SPPB, Barthel and Lawton indexes), cognitive (MMSE) and frailty status (Fried Phenotype, Frailty Trait Scale - short version, SHARE-FI, 35-Items Rockwood Frailty Index, Clinical Frailty Scale, FRAIL scale and Gérontopôle Frailty Screening Tool) in the baseline visit, month 12 and month 18 visit of follow up. At 6 month a phone call will be made to assess whether there have been falls and to check the vital status.

DISCUSSION: Currently, the usefulness of certain assessment tools in social and clinical settings have not been properly assessed, including their ability to predict the individual risk for different adverse outcomes, which is the main interest in daily practice. The FRAILTOOLS project concentrates on providing screening and diagnostic tools for frailty in those settings where its prevalence is the highest and where efforts in prevention could make a significant change in the trend towards disability. **TRIAL REGISTRATION:** Comprehensive validation of frailty assessment tools in older adults in different clinical and social settings (FRAILTOOLS), NCT02637518 (date of registration: 12/18/2015).



Head injury in the elderly - an overview for the physician

Beedham W, Peck G, Richardson SE, Tsang K, Fertleman M, Shipway DJ. Clin. Med. (Lond.) 2019; 19(2): 177-184.

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30872306

Abstract

Head injury is a common cause for hospital admission and additionally 250,000 UK inpatients fall during hospital admissions annually. Head injury most commonly occurs as a result of falls from standing height in older adults. Older adults are frequently frail and multi-morbid; many have indications for anticoagulation and antiplatelet agents. The haemorrhagic complications of head injury occur in up to 16% of anticoagulated patients sustaining a head injury. These patients suffer adverse outcomes from surgery as a result of medical complications. Although geriatric trauma models are evolving to meet the demand of an ageing trauma population, medical support to trauma services is commonly delivered by general physicians, many of whom lack experience and training in this field. Determining the role of surgery and interrupted anticoagulation requires careful personalised risk assessment. Appreciation of the opposing risks can be challenging; it requires an understanding of the evidence base in both surgery and medicine to rationalise decision making and inform communication. This article aims to provide an overview for the physician with clinical responsibility for patients who have sustained head injury.

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Language: en

Keywords

Elderly; head injury; intracranial haemorrhage; subdural; trauma

Impact of three dementia-related behaviors on caregiver depression: the role of rejection of care, aggression, and agitation

Choi SSW, Budhathoki C, Gitlin LN. *Int. J. Geriatr. Psychiatry* 2019; ePub(ePub): ePub.

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30897238

Abstract

OBJECTIVE: The relationship of specific dementia-related behaviors to caregiver depression and moderating factors is unclear. We examined the role of rejection of care, aggression and agitation to caregiver depression and if social support and mastery independently moderated associations.

METHODS: Cross-sectional, secondary analysis using baseline data from two community-based clinical trials. We examined frequency of occurrence of presenting behaviors and their combinations in persons with dementia. Multiple logistic regression analyses examined associations between non-overlapping behavioral clusters (agitation alone, agitation + rejection, agitation + aggression, and agitation + rejection + aggression) and caregiver depression. Multiple logistic regression with interaction terms was also used to investigate whether social support or caregiver mastery moderated the relationship between behavioral symptom clusters and caregiver depression.

RESULTS: Three of four symptom clusters (all three behaviors [AOR=2.22, 95% CI=1.02-4.83], agitation + rejection of care [AOR=2.55, 95% CI=1.06-6.13], and agitation + aggression [AOR=2.63, 95% CI=1.17-5.89]) had a positive association with caregiver depression, whereas agitation alone was not significantly associated with caregiver depression. Neither social support nor mastery significantly moderated the relationship between these three behavioral clusters and caregiver depression.

CONCLUSION: Caregiver depression was associated with different combinations of behaviors but not with agitation alone. These results have implications for intervention development and identifying caregivers at risk for depression. Level of social support and mastery do not appear to moderate impact on caregiver depression.

Keywords

aggression; agitation; caregiver depression; dementia; rejection of care

Is quality of life related to risk of falling, fear of falling, and functional status in patients with hip arthroplasty?

Büker N, Eraslan U, Kitiş A, Kiter AE, Akkaya S, Sutcu G. *Physiother. Res. Int.* 2019; ePub(ePub): ePub.

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10.1002/pri.1772

PMID

30892811

Abstract

OBJECTIVE: The aim of the study was to investigate the relation between health-related quality of life and risk of falling, fear of falling, and functional status in patients with hip arthroplasty.

METHODS: In this cross-sectional study, 48 hips of 45 patients who aged between 33 and 79 (53.56 ± 12.50) years and had cementless total hip arthroplasty between 2010 and 2014 were evaluated. Twenty-seven of the patients participated in the study were female (60.0%) and 18 were male (40.0%). Health-related quality of life with Nottingham Health Profile, function of the hip joint with Harris Hip Score, risk of falling with Performance-Oriented Motion Assessment I, and fear of falling with Falls Efficacy Scale were assessed. In addition, chair stand test, 40-m walk test, stair-climb test, and single leg stance test were carried out. In analysing the relationships between these parameters, Pearson correlation analysis was employed. The level of significance was considered as $p < 0.05$.

RESULTS: Among the cases, who were evaluated 87.10 ± 45.22 (22.43-214.71) weeks after the operation, a significant correlation was found between health-related quality of life and risk of falling, function of hip joint, and functional tests ($p < 0.05$).

CONCLUSION: The evaluation of the factors related to health-related quality of life in hip arthroplasty patients may help identify patient needs and guide the rehabilitation process.

Language: en

Keywords

falls; hip replacement arthroplasty; quality of life; recovery of function

Low-income homebound older adults receiving home-delivered meals: physical and mental health conditions, incidence of falls and hospitalisations

Citation

Choi NG, Sullivan JE, Marti CN. Health Soc. Care Community 2019; ePub(ePub): ePub.

Affiliation

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Abstract

Significant differences in health across racial/ethnic and socioeconomic groups in the US signal increasing numbers of low-income homebound older adults in a rapidly ageing society. The purpose of this study was to examine physical and psychiatric conditions and their association with incidence of self-reported falls and hospitalisations among largely low-income and racial/ethnic minority adults age 50+ (N = 2,224), clients from a home-delivered meals programme in Central Texas. Data came from comprehensive, in-home assessments done in 2017 by these older adults' case managers. We used bivariate analyses to compare those with and without incidence of self-reported past-year falls and those with and without a hospitalisation episode with respect to their sociodemographic and clinical characteristics. We used multivariable logistic regression analysis to examine sociodemographic and clinical correlates of any incidence of falls and negative binomial regression analysis to examine these correlates of the number of hospitalisations in the preceding 12 months. The rates of chronic physical illnesses, including cardiovascular disease, diabetes, gastrointestinal disease, lung disease and renal failure, were extremely high. The 41% of reported falls among the study sample was also higher than the rate among US older adults in general. More diagnosed physical illnesses, depression, chewing/swallowing problems, chronic/severe pain, activities and instrumental activities of daily living (ADL/IADL) impairments and ambulation assistive device use were associated with greater odds of falling. The rate of past-year hospitalisation was 26%, and more diagnosed physical illnesses, ADL/IADL impairments, ambulation assistive device use and any fall incidence were positively associated with the number of hospitalisations. These findings indicate the need for fall prevention programmes for frail homebound older adults as well as health and social care services that help older adults better manage physical/mental health problems and reduce preventable health crises and hospitalisations.

Keywords

ambulation assistive devices; chronic illnesses; disabilities; falls; hospitalisations; low-income homebound older adults; psychiatric disorders

Melatonin affects postural control in community-dwelling older adults while dual tasking: a randomized observation study

Lui MFG, Chow HKD, Wong WMK, Tsang WNW. *J. Aging Phys. Act.* 2018; 27(1): 102-107.

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DOI

10.1123/japa.2017-0312

PMID

unavailable

Abstract

The effects of a single 3-mg dose of melatonin on the postural control and cognitive performance of community-dwelling older adults were documented. The testing involved stepping down while performing a cognitive task (a Stroop test). Thirty-four older adults were recruited. Immediately before and 1 hr after taking a dose of melatonin, they completed a single-leg standing task after stepping down with and without a simultaneous Stroop test, and a double-leg standing task. The findings indicated a statistically significant increase in sway area under the dual-tasking condition after taking melatonin ($p = .04$) and the double-leg standing task ($p = .018$). However, cognitive performance per se was not affected by the melatonin. Melatonin impairs postural control in older adults but not cognitive performance.

Language: en

Optimization and technical validation of the AIDE-MOI fall detection algorithm in a real-life setting with older adults

Scheurer S, Koch J, Kucera M, Bryn H, Bärtschi M, Meerstetter T, Nef T, Urwyler P. *Sensors (Basel)* 2019; 19(6): s19061357.

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30889925

Abstract

Falls are the primary contributors of accidents in elderly people. An important factor of fall severity is the amount of time that people lie on the ground. To minimize consequences through a short reaction time, the motion sensor "AIDE-MOI" was developed. "AIDE-MOI" senses acceleration data and analyzes if an event is a fall. The threshold-based fall detection algorithm was developed using motion data of young subjects collected in a lab setup. The aim of this study was to improve and validate the existing fall detection algorithm. In the two-phase study, twenty subjects (age 86.25 ± 6.66 years) with a high risk of fall (Morse > 65 points) were recruited to record motion data in real-time using the AIDE-MOI sensor. The data collected in the first phase (59 days) was used to optimize the existing algorithm. The optimized second-generation algorithm was evaluated in a second phase (66 days). The data collected in the two phases, which recorded 31 real falls, was split-up into one-minute chunks for labelling as "fall" or "non-fall". The sensitivity and specificity of the threshold-based algorithm improved significantly from 27.3% to 80.0% and 99.9957% (0.43) to 99.9978% (0.17 false alarms per week and subject), respectively.

Language: en

Keywords

fall detection; healthcare; sensors; threshold algorithm; wearable

Outcomes of a physical therapist-led, statewide, community-based fall risk screening

Karlsson L, Doe K, Gerry M, Moore B, Wingood M, Renfro M, Gell N. J. Geriatr. Phys. Ther. 2019; ePub(ePub): ePub.

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PMID:30883528

Abstract

BACKGROUND AND PURPOSE: Falls are the leading cause of morbidity and mortality among US older adults and result in considerable medical and social consequences. Community-based screenings are a type of intervention that provides accessible fall risk screening and education at no cost to the participants. However, little is known about whether or how participants change behavior after screening events. Therefore, the purpose of this study was to quantify and characterize participant risk-reducing behaviors after community-based fall risk screenings.

METHODS: Participants were recruited during 22 community-based fall risk screening events in 2017 led by physical therapists. The screenings were conducted using a modified version of the Centers for Disease Control and Prevention Stopping Elderly Accidents, Deaths, and Injuries (CDC STEADI) toolkit. Screenings included risk reduction education via group format and individual recommendations tailored to fall risk classification based on the screening outcomes. For the study, questionnaires were used at baseline to collect demographics and screening results and at 1-month and 5-month follow-up to assess risk reduction behavior change. Descriptive statistics characterized behavior change and assessed outcome differences by baseline fall risk level. Logistic regression analyses examined factors impacting behavior change after screening.

RESULTS AND DISCUSSION: At baseline, 123 participants enrolled and 104 (84.6%) responded at 1- and 5-month follow-up. By 1 month, 50.0% of participants had adopted at least 1 fall risk-reducing behavior, which increased to 64.9% by 5 months. Moderate or high fall risk was significantly associated with adopting a new behavior change by 5 months compared with those with low fall risk ($P = .04$). The odds of adopting a fall risk reduction strategy by 5 months increased with higher education (odds ratio: 2.5, 95% confidence interval: 1.0-6.0) and moderate/high fall risk (odds ratio: 3.0, 95% confidence interval: 1.3-7.2) in a logistic regression model adjusted by age and sex.

CONCLUSIONS: Screening and education using the STEADI toolkit during community-based screenings result in short- and long-term behavior change to reduce fall risk among older adults, particularly those with moderate to high fall risk. Further research is needed to identify barriers and incentives among participants who do not make fall-related behavioral changes after screening.

Polypharmacy and potentially inappropriate medication use in older patients with multiple myeloma, related to fall risk and autonomous neuropathy

Umit EG, Baysal M, Bas V, Asker I, Kirkızlar O, Demir AM. J. Oncol. Pharm. Pract. 2019; ePub(ePub): ePub.

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Abstract

PURPOSE: Multiple myeloma is a chronic, incurable hematological cancer with the involvement of multiple organ systems. As a disease affecting older patients, the treatment of multiple myeloma should be based on individual patient characteristics. Polypharmacy is an increasing problem in the care of older patients and in patients with multiple myeloma, polypharmacy is almost inevitable. We aimed to evaluate the applicability of polypharmacy definitions and the relation of polypharmacy with disease outcomes in patients with multiple myeloma.

METHODS: Eighty patients older than 65 years and diagnosed with multiple myeloma were retrospectively enrolled. Patient files, prescriptions, evaluations for polypharmacy were determined according to Beers and START/STOPP criteria. Outcomes were recorded from files in terms of fractures, autonomous neuropathy, and renal functions.

RESULTS: Polypharmacy with ≥ 4 drugs was observed in 65 patients while polypharmacy with ≥ 5 drugs was observed in 51 patients. Autonomous neuropathy, polypharmacy with more than four or five medications, and use of multiple medications in the same category were related with poor ECOG performance status in women, while prolonged use of benzodiazepines and central nervous system (CNS) affecting drugs and inappropriate polypharmacy were more frequent in men with poor ECOG performance status. The majority of patients aged 75-84 years were observed to use inappropriate polypharmacy. Autonomous neuropathy and fall risk were observed to be significantly related with inappropriate polypharmacy.

CONCLUSIONS: Drugs affecting balance and perception should be reconsidered in patients with multiple myeloma.

Keywords

Myeloma; fall risk; neuropathy; polypharmacy

Prevalence, risk factors, circumstances for falls and level of functional independence among geriatric population - a descriptive study

Pitchai P, Dedhia HB, Bhandari N, Krishnan D, D'Souza NRJ, Bellara JM. Indian J. Public Health 2019; 63(1): 21-26.

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Abstract

BACKGROUND: Falls is one of the common problems faced by elderly population and in preventing falls in India, research has largely focused on identification and management of risk factors, but the circumstances of the fall and its associated factors are sparsely researched.

OBJECTIVES: The primary objective is to find the prevalence of fall, investigate risk factors, and its circumstances for falls and level of functional independence in elderly population. The secondary objective is to find out fear of fall (FOF) and its association of demographic factors on elderly population.

METHODS: This was a cross-sectional study; 2049 elderly population of 60 years and above were recruited by one-stage cluster sampling technique within Mumbai, Panvel, and Thane cities, Maharashtra. Data were collected using a questionnaire, Fall Efficacy Scale-International, Barthel Index, and Kuppuswamy Scale. Obtained responses were analyzed using SPSS software; descriptive statistics and Chi-square test were applied.

RESULTS: The prevalence of falls in this study found as 24.98%. Demographic factors such as age group, education, marital status, and socio-economic status had demonstrated a significant association with older adults ($P < 0.05$); 44.92% of falls occurred in the morning, the majority of falls (65.43%) occurred indoors, 56.45% of the fallers reported to had slips, and 60.55% of the fallers had sustained injuries. From the total participants, 34.70% of the fallers reported FOF, 23.67% of the fallers expressed reduced functional activities, and 18.06% of the fallers demonstrated affection in activities of daily living.

CONCLUSION: This study reveals fall as a significant health problem and provides insight into the influencing risk factors for falls among older adults.

Language: en

Keywords

Activities of daily living; fear of fall; functional activity; prevalence of falls; risk factors

Risk of institutionalization following fragility fractures in older people

Benzinger P, Riem S, Bauer J, Jaensch A, Becker C, Büchele G, Rapp K. Osteoporos. Int. 2019; ePub(ePub): ePub.

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Abstract

Previously independent living older people suffering fractures of the hip have a high risk of new admission to a nursing home during the subsequent months. This study shows that older people admitted to hospital for fractures of the pelvis and spine have a similar risk of admission to a nursing home.

INTRODUCTION: Fall-related fractures are a serious threat to the health and well-being of older persons. Long-term consequences of hip fractures such as institutionalization and mortality are well-known. The impact of other fragility fractures is less well-understood. The aim of this study was to estimate risks of institutionalization and death for different fragility fractures and compare them with the corresponding risks after hip fracture.

METHODS: Data was retrieved from a German health insurance company. Between 2005 and 2008 more than 56,000 community-dwelling people with a hospital admission or discharge diagnosis of a fracture of the femur, spine, pelvis, proximal humerus, distal radius, tibia, or fibula were included. Crude and age-adjusted 6-month incidence rates for institutionalization and death were calculated. To compare the risks of institutionalization or mortality of non-hip fractures with the risk after hip fracture, multivariate regression models were applied.

RESULTS: Crude institutionalization rates and mortality were highest in patients with hip fracture. However, after adjustment for age, functional status, and comorbidity, risks of institutionalization after fractures of pelvis (relative risk (RR), 0.94; 95% confidence interval (CI) 0.86; 1.02 in women and 0.89; 95% CI 0.70; 1.12 in men), and spine (RR, 0.95; 95% CI 0.87; 1.03 in women and 0.91; 95% CI 0.76; 1.08 in men) were not statistically different compared to the risk after hip fracture.

CONCLUSIONS: The risk of institutionalization after fractures of the spine and pelvis was similar to the risk after hip fracture. These fracture sites seem to be associated with a significant decline in physical function.

Keywords

Epidemiology; Falls; Femoral fractures; Hip fractures; Humeral fractures; Osteoporosis; Spinal fractures

Utility of center of pressure measures during obstacle crossing in prediction of fall risk in people with Parkinson's disease

Conceição NRD, Nóbrega de Sousa P, Pereira MP, Gobbi LTB, Vitório R. *Hum. Mov. Sci.* 2019; 66: 1-8.

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PMID: 30889495

Abstract

INTRODUCTION: Postural instability during walking and tripping over obstacles are the main causes of falls in people with Parkinson's disease (PD). Preliminary limited evidence suggests that the length of the prospective follow-up period affects falls prediction in PD, with shorter periods leading to more accurate prediction. Thus, the primary aim of the present study was to test the performance of center of pressure (CoP) variables during obstacle crossing to predict fall risk in people with PD during subsequent periods of four, six, and 12 months. We also compared CoP variables during obstacle crossing between fallers and non-fallers.

METHODS: Forty-two individuals with PD, in mild to moderate stages, completed the baseline obstacle crossing assessment and reported falls for 12 months. Participants walked at their self-selected pace and were instructed to cross an obstacle (half knee height) positioned in the middle of an 8-m long pathway. A force platform was used to analyze CoP parameters of the stance phase of the trailing limb (most affected limb). The ability of each outcome measure to predict fall risk at four, six, and 12 months was assessed using receiver operating characteristic curve analyses.

RESULTS: Ten individuals (23.8%) were considered fallers at four months, twelve individuals (28.5%) at six months, and twenty-one individuals (50%) at 12 months. CoP amplitude and CoP velocity in the mediolateral direction significantly predicted fall risk at four, six, and 12 months. As judged by the area under the curve, mediolateral CoP velocity showed the best performance at four months, while mediolateral CoP amplitude showed the best performance at six months. Fallers presented greater values of mediolateral CoP velocity and amplitude than non-fallers.

CONCLUSION: These findings suggest that mediolateral CoP velocity and amplitude during obstacle crossing might be useful to predict fall risk in people with PD. Therefore, larger studies are encouraged.

Keywords

Adaptive walking; Faller; Movement disorders; Prediction

What type of environmental assessment and modification prevents falls in community dwelling older people?

Pighills A, Drummond A, Crossland S, Torgerson DJ. BMJ 2019; 364: l880.

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PMID

30872322

Abstract

[Abstract unavailable]

What you need to know:

- Evidence suggests that environmental interventions can prevent falls in older people at high risk of falls, but they have little or no benefit in people at low risk
- Offer environmental assessments and modifications led by an occupational therapist to people over 65 who have had a fall in the past year, use a mobility aid, need assistance with any activity of daily living, take psychoactive medications, or are concerned about falling.
- Environmental assessment and modification encompasses a comprehensive, validated functional assessment of the individual in their home environment, a joint problem solving approach, and follow-up as required.

Language: en

A multi-path compensation method for ranging in wearable ultrasonic sensor networks for human gait analysis

Ashhar K, Khyam MO, Soh CB. *Sensors (Basel)* 2019; 19(6): s19061350.

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PMID

30889883

Abstract

Gait analysis in unrestrained environments can be done with a single wearable ultrasonic sensor node on the lower limb and four fixed anchor nodes. The accuracy demanded by such systems is very high. Chirp signals can provide better ranging and localization performance in ultrasonic systems. However, we cannot neglect the multi-path effect in typical indoor environments for ultrasonic signals. The multi-path components closer to the line of sight component cannot be identified during correlation reception which leads to errors in the estimated range and which in turn affects the localization and tracking performance. We propose a novel method to reduce the multi-path effect in ultrasonic sensor networks in typical indoor environments. A gait analysis system with one mobile node attached to the lower limb was designed to test the performance of the proposed system during an indoor treadmill walking experiment. An optical motion capture system was used as a benchmark for the experiments. The proposed method gave better tracking accuracy compared to conventional coherent receivers. The static measurements gave 2.45 mm standard deviation compared to 10.45 mm using the classical approach. The RMSE between the ultrasonic gait analysis system and the reference system improved from 28.70 mm to 22.28 mm. The gait analysis system gave good performance for extraction of spatial and temporal parameters.

Language: en

Keywords

chirp compression; correlation receiver; gait analysis; multi-path compensation

A role for the lower visual field information in stair climbing

Miyasike-Dasilva V, Singer JC, McIlroy WE. *Gait Posture* 2019; 70: 162-167.

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PMID

30875603

Abstract

BACKGROUND: Locomotion on stairs is challenging for balance control and relates to a significant number of injurious falls. The visual system provides relevant information to guide stair locomotion and there is evidence that peripheral vision is potentially important. **RESEARCH QUESTION:** This study investigated the role of the lower visual field information for the control of stair walking. It was hypothesized that restriction in the lower visual field (LVF) would significantly impact gaze and locomotor behaviour specifically during descent and during transition phases emphasizing the importance of the LVF information during online control.

METHODS: Healthy young adults (n = 12) ascended and descended a 7-step staircase while wearing customized goggles that restricted the LVF. Three visual conditions were tested: full field of view (FULL); 30° (MILD), and 15° (SEVERE) of lower field of view available. Stride time, head pitch angle and handrail use were assessed during approach, transition steps (two steps at the top and bottom of the stairs) and middle step phases.

RESULTS: Transient downward head pitch angle increased with LVF restriction, while walk speed decreased and handrail use increased. Occlusion impaired stair descent more strongly than ascent reflected by a larger downward head pitch angles and slower walk times. LVF restriction had a greater influence on stride time and head angle during the approach and first transition compared to other stair regions. **SIGNIFICANCE:** Information from the lower visual field is important to guide stair walking and particularly when negotiating the first few steps of a staircase. Restriction in the lower visual field during stair walking results in more cautious locomotor behaviour such as walking slower and using the handrails. In daily activities, tasks or conditions that restrict or alter the lower visual field information may elevate the risk for missteps and falls.

Language: en

Keywords

Handrail; Locomotion; Peripheral vision; Stair climbing; Vision; Visual field

A systematic review of falls in hospital for patients with communication disability: highlighting an invisible population

Hemsley B, Steel J, Worrall L, Hill S, Bryant L, Johnston L, Georgiou A, Balandin S. *J. Saf. Res.* 2019; 68: 89-105.

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Abstract

BACKGROUND: Patients with communication disability, associated with impairments of speech, language, or voice, have a three-fold increased risk of adverse events in hospital. However, little research yet examines the causal relationship between communication disability and risk for specific adverse events in hospital.

OBJECTIVE: To examine the impact of a patient's communication disability on their falls risk in hospital.

METHODS: This systematic review examined 61 studies on falls of adult hospital patients with communication disability, and patients at high risk of communication disability, to determine whether or not communication disability increased risk for falls, and the nature of and reasons for any increased risk.

RESULTS: In total, 46 of the included studies (75%) reported on participants with communication disability, and the remainder included patients with health conditions placing them at high risk for communication disability. Two thirds of the studies examining falls risk identified communication disability as contributing to falls. Commonly, patients with communication disability were actively excluded from participation; measures of communication or cognition were not reported; and reasons for any increased risk of falls were not discussed.

CONCLUSIONS: There is some evidence that communication disability is associated with increased risk of falls. However, the role of communication disability in falls is under-researched, and reasons for the increased risk remain unclear. Practical applications: Including patients with communication disability in falls research is necessary to determine reasons for their increased risk of adverse events in hospital. Their inclusion might be helped by the involvement of speech-language pathologists in falls research teams.

Keywords

Communication disability; Falls; Hospital; Patient safety incidents; Risk

Do patients with severe poststroke communication difficulties have a higher incidence of falls during inpatient rehabilitation? A retrospective cohort study

Sullivan R, Harding K. Top. Stroke Rehabil. 2019; ePub(ePub): ePub.

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PMID

30890038

Abstract

BACKGROUND: Falls in hospital are common and serious complications of stroke. Associations have been found between communication disorders and increased rates of falls, but have received relatively little consideration as a risk factor for falls among stroke survivors.

OBJECTIVES: To investigate whether there is an association between severe communication impairment and falls among patients receiving inpatient rehabilitation after stroke.

METHODS: A retrospective audit of 149 records of consecutive patients admitted to an inpatient rehabilitation facility after stroke over a two-year period was conducted. The relationship between falls and severe communication impairment was explored using (1) direct comparison of falls in patients with and without functional communication for the inpatient ward environment and (2) multivariate logistic regression to examine factors that may predict falls, including presence or absence of functional communication. In each analysis, falls were examined both as a binary outcome (fall or no fall), and the rate of falls per day.

RESULTS: The 32 patients in the sample (21.7%) who were unable to communicate their basic needs were almost twice as likely to fall in hospital as those with functional communication (RR 1.94, 95% CI 1.15 to 3.24). Several commonly assessed factors were not significant predictors of falls (including falls history, polypharmacy, and cognitive impairment) in this population. Lack of functional communication was the strongest independent predictor of falls rate.

CONCLUSIONS: Findings suggest that severe communication disorders may be under recognized as a falls risk factor after stroke.

Language: en

Keywords

Falls; communication impairment; rehabilitation; risk factors; stroke

Efficacy of balance training for hip fracture patients: a meta-analysis of randomized controlled trials

Wu JQ, Mao LB, Wu J. *J. Orthop. Surg. Res.* 2019; 14(1): e83.

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PMID

30894205

Abstract

BACKGROUND: To investigate whether the clinical effects of balance training were improved in hip fracture patients.

METHODS: Electronic databases which included PubMed, Embase, Web of Science, and the Cochrane Library up to December 2018 were searched. High-quality randomized controlled trials (RCTs) and prospective clinical controlled studies were selected based on inclusion criteria. Stata 12.0 was used for the meta-analysis. Standard mean difference (SMD) with 95% confidence interval (CI) was used to assess the effects.

RESULTS: Finally, 9 studies with 872 patients (balance training = 445, control = 427) were included in our meta-analysis (published between 1997 and 2018). Compared with the control group, balance training group showed a significant increase in overall function (SMD = 0.59, 95% CI [0.25, 0.93], $P = 0.001$), gait speed (SMD = 0.63, 95% CI [0.19, 1.07], $P = 0.005$), lower limb strength (SMD = 0.73, 95% CI [0.50, 0.95], $P = 0.000$), activities of daily living (ADLs) (SMD = 0.97, 95% CI [0.61, 1.34], $P = 0.000$), performance task scores (SMD = 0.41, 95% CI [0.21, 0.61], $P = 0.000$), and health-related quality of life (HRQoL) scores (SMD = 0.32, 95% CI [0.16, 0.47], $P = 0.000$).

CONCLUSIONS: Our meta-analysis revealed that the balance training group has improved overall physical functioning, gait, lower limb strength, performance task, and activity of daily living than the control group. More high-quality and large-scale RCTs are needed to identify the optimal regimen of balance training after hip fracture.

Language: en

Keywords

Autologous bone; Core decompression; Marrow cells implantation; Meta-analysis; Osteonecrosis of femoral head

The relationship between culture of safety and rate of adverse events in long-term care facilities

Abusalem S, Polivka B, Coty MB, Crawford TN, Furman CD, Alaradi M. *J. Patient Saf.* 2019; ePub(ePub): ePub.

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PMID

30889049

Abstract

OBJECTIVE: The aim of the study was to assess the relationship of culture of safety dimensions and the rate of unanticipated care outcomes in long-term care facilities (LTCFs) using the Agency for Healthcare Research and Quality framework of resident safety culture.

METHODS: Cross-sectional survey data were collected on 13 dimensions of culture of safety in five LTCFs from registered nurses, licensed practical nurses (LPNs), nursing assistants, administrators/managers, administrative support, and rehabilitation staff. Secondary data on falls in the five LTCFs from quarters 1 to 3 of 2014 were obtained from the Centers for Medicare and Medicaid Services in February 2015. Spearman's ρ and the Generalized Estimating Equations using a log link (Poisson distribution) were used.

RESULTS: Communication and feedback about incidences reported the highest mean scores ($M = 4.35$, $SD = 0.71$). Higher rate of falls was associated with a lower level of team work, lower degree of handoffs, and lower levels of organizational learning. The risk for falls increased as the number of residents per facility increased (rate ratio [RR] = 1.02; 95% confidence interval [CI] = 1.01-1.02) and as the number of LPN hours per resident increased (RR = 37.7, 95% CI = 18.5-76.50). Risk for long stay urinary tract infections increased as number of residents increased (RR = 1.01, 95% CI = 1.01-1.01). Increase in culture of safety score was associated with decrease in risk of falls, long stay urinary tract infections, and short stay ulcers.

CONCLUSIONS: With the shortage of registered nurses in LTCFs and new reimbursement regulations, many LTCFs are hiring LPNs to have full staffing and save money. Licensed practical nurses may lack essential knowledge to decrease the rate of falls.

Language: en