

Safety Literature 18th June 2023

Risk factors for falls and fall-related fractures in community-living older people with pain: a prospective cohort study

Hirase T, Okubo Y, Delbaere K, Menant JC, Lord SR, Sturnieks DL. *Int. J. Environ. Res. Public Health* 2023; 20(11).

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DOI 10.3390/ijerph20116040 **PMID** 37297643

Abstract

(1) Background: This prospective study aimed to identify predictors of falls and fall-related fractures in community-dwelling older people with pain; (2) Methods: Participants comprised 389 community-dwelling older people aged 70+ years who had musculoskeletal pain in the neck, back, hip, leg/knee and/or feet. Demographic, anthropometric, balance, mobility, cognitive function, psychological status and physical activity level measures were obtained at baseline. Falls were monitored with monthly falls calendars for 12 months. Logistic regression analyses were performed to identify predictors of falls and fall-related fractures during a 12-month follow-up; (3) Results: Of the 389 participants, 175 (45.0%) and 20 (5.1%) reported falls and fall-related fractures during the 12-month follow-up, respectively. Greater postural sway on foam, more depressive symptoms and lower physical activity levels at baseline were associated with falls during the 12-month follow-up. Slower walking speed at baseline was associated with fall-related fractures during the 12-month follow-up. These associations remained significant after adjusting for age, sex, body mass index, comorbidities and medication use; (4) Conclusions: This study suggests poor balance, low mood and a less active lifestyle are predictors of falls, and slower walking speed predicts fall-related fractures among community-dwelling older people with pain.

Language: en

Keywords

aged; physical activity; accidental falls; balance; gait; mobility; pain

An analysis of the associated factors for falls, recurrent falls, and fall-related injuries among the older adults in senior Chinese apartments: a cross-sectional study

Su Q, Song M, Mao Y, Ku H, Gao Y, Pi H. *Geriatr. Nurs.* 2023; 52: 127-132.

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PMID 37290218

Abstract

Older adults living in care facilities such as senior apartments may experience falls and severe falls (i.e., fall-related injuries or falls ≥ 2 times), which are associated with multiple risk factors. However, there are few studies on falls among older adults in senior Chinese apartments. The purpose of our study is to investigate the current situation of falls among older adults in senior apartments and analyze the related factors of falls and severe falls, to assist agency workers in identifying older adults who are at high risk of falls and reducing fall occurrence and fall injuries.

Language: en

Keywords

Risk assessment; Accidental fall; Older adults; Factors; Senior apartment

Association of spinal alignment and abdominal circumference with sarcopenia status and fall risk in patients with osteoporosis: a retrospective study

Nagai T, Miyagami M, Okano I, Nakamura S, Okazaki Y, Sakamoto K, Kasai F, Kudo Y, Kawate N. *Nutrients* 2023; 15(11).

(Copyright © 2023, MDPI Publishing)

DOI 10.3390/nu15112571 **PMID** 37299534

Abstract

Since vertebral kyphosis and abdominal circumference are thought to influence sarcopenia and fall risk in osteoporosis, we evaluated sarcopenia and fall risk in patients with different measurements of abdominal circumference and sagittal longitudinal axis (SVA). In this post hoc study, 227 patients aged 65 years or more who visited an outpatient osteoporosis clinic were included in the analysis. Sarcopenia was determined from lean body mass, grip strength, and walking speed by dual energy X-ray absorptiometry; SVA (median 40 mm) and abdominal circumference (median 80 cm) were compared between the four groups, each divided into two groups. Nutritional management, falls, and fall anxiety scores were also examined. The incidence of sarcopenia was significantly increased in those with abdominal circumference < 80 cm in both the SVA < 40 mm and SVA ≥ 40 mm groups ($p < 0.05$). Nonetheless, the fall scores of those with SVA < 40 mm were lower than those of individuals with SVA ≥ 40 mm ($p < 0.01$). Based on the results of this study, SVA and abdominal circumference values may predict the risk of sarcopenia and falls. More research is needed before our results can be translated into clinical practice.

Language: en

Keywords

osteoporosis; fall risk; abdominal circumference; obesity; sarcopenia

Design and research of wearable fall protection device for the elderly

Wang J, Sun Y, Chen Z, Jin Y, Xu Y. Zhongguo Yi Liao Qi Xie Za Zhi 2023; 47(3): 278-283.

(Copyright © 2023, Guo jia yi yao guan li ju Yi liao qi xie qing bao zhong xin zhan)

DOI 10.3969/j.issn.1671-7104.2023.03.009 PMID 37288628

Abstract

A protective device was designed that can be worn on the elderly, which consists of protective airbag, control box and protective mechanism. The combined acceleration, combined angular velocity and human posture angle are selected as the parameters to determine the fall, and the threshold algorithm and SVM algorithm are used to detect the fall. The protective mechanism is an inflatable device based on CO(2) compressed air cylinder, and the equal-width cam structure is applied to its transmission part to improve the puncture efficiency of the compressed gas cylinder. A fall experiment was designed to obtain the combined acceleration and angular velocity eigenvalues of fall actions (forward fall, backward fall and lateral fall) and daily activities (sitting-standing, walking, jogging and walking up and down stairs), showing that the specificity and sensitivity of the protection module reached 92.1% and 84.4% respectively, which verified the feasibility of the fall protection device.

Language: zh

Keywords

Aged; Humans; Algorithms; Walking; Activities of Daily Living; *Monitoring, Ambulatory; *Wearable Electronic Devices; Acceleration; fall detection; inertial sensor; smart wearable; the elderly fall protection

Evaluation of factors affecting prognosis and mortality in geriatric patients presented to the emergency service with head trauma

Eryurt SC, Sahin T, Oral S. Aging Med. (Milton) 2023; 6(2): 177-183.

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DOI 10.1002/agm2.12247 PMID 37287676

Abstract

OBJECTIVE: Head trauma, a cause of serious morbidity and mortality in general, is among the most common causes of emergency department visits in geriatric patients. In this context, this study investigated the factors affecting prognosis and mortality in geriatric patients presenting with head trauma at the emergency department.

METHODS: This retrospective cohort study included 842 patients aged 65 years and above who presented with head trauma to the emergency department between January 1, 2019, and December 31, 2019. Demographic and clinical data of the 622 patients included in the study were analyzed.

RESULTS: A total of 622 geriatric patients with head trauma were included in this study. Of these, 54.2% (337/622) were men, and 45.8% (285/622) were women. The mean age of the patients was 75.3 ± 7.5 years. Antihypertensives were the most common medications taken by the patients. Subdural hematoma is the most frequently observed cranial pathology. A simple fall is the most observed mechanism for trauma. A total of 17.5% (109/622) of the patients were admitted to the hospital. Of these patients, 8.4% (52/622) were transferred to the intensive care unit and 2.6% (16/622) of the patients died.

CONCLUSION: Mortality would be expected to be higher in elderly patients with head trauma, hypotension, or high lactate levels. The need for intensive care unit transfer was higher in patients with coronary artery disease. The mortality rate of the patients increased with an increasing length of hospital stay.

Language: en

Keywords

emergency department, geriatric population, head trauma, mortality, prognosis

Fall prevention by reactive balance training on a perturbation treadmill: is it feasible for prefrail and frail geriatric patients? A pilot study

Trampisch US, Petrovic A, Daubert D, Wirth R. Eur. Geriatr. Med. 2023; ePub(ePub): ePub.

(Copyright © 2023, Elsevier Publishing)

DOI 10.1007/s41999-023-00807-9 **PMID** 37310607

Abstract

PURPOSE: Prefrail and frail geriatric patients are at high risk of falling. Perturbation-based balance training on a treadmill appears to be highly effective, but there are no studies in prefrail and frail geriatric hospital patients. The aim of the work is to characterize the study population in whom reactive balance training on a perturbation treadmill was feasible.

METHODS: The study is recruiting patients with at least one fall event in the past year (age ≥ 70). The patients complete a minimum of 60-min treadmill training with/without perturbations on at least 4 occasions.

RESULTS: Until now, 80 patients (mean age 80 ± 5) took part in the study. More than half of the participants had some cognitive impairment with < 24 pts. (median MoCA 21 pts.), 35% were prefrail and 61% were frail. The drop-out rate was initially 31% and was reduced to 12% after adding a short pre-test on the treadmill.

CONCLUSION: Reactive balance training on a perturbation treadmill is feasible for prefrail and frail geriatric patients. Its effectiveness in fall prevention in this population needs to be proven. **TRIAL REGISTRATION:** German Clinical trial register (DRKS-ID: DRKS00024637 on 24.02.2021).

Language: en

Keywords

Aged; Aged, 80 and over; Cognition; Exercise; Accidental falls; Feasibility studies; Frail elderly

Influence of transcutaneous electrical nerve stimulation on walking kinematics and standing balance of older adults who differ in walking speed

Alenazy MS, Al-Jaafari R, Folkesson-Dey A, Enoka RM. Exp. Brain Res. 2023; ePub(ePub): ePub.

(Copyright © 2023, Holtzbrinck Springer Nature Publishing Group)

DOI 10.1007/s00221-023-06615-8 **PMID** 37310476

Abstract

The purpose was to determine the impact of transcutaneous electrical nerve stimulation (TENS) on measures of walking kinematics and standing balance of healthy older adults who were stratified into two groups based on differences in the distance walked during the 6-min test of walking endurance. Regression models were developed to explain the variance in the 6-min distance and to assess the predictive power of balance metrics to categorize the 26 older adults (72 ± 5.4 yrs) as either slow or fast walkers. Walking kinematics were measured during 6- and 2-min walk tests that were performed with and without the concurrent application of TENS to the hip flexor and ankle dorsiflexor muscles. Participants walked briskly during the 6-min test and at a preferred pace during the 2-min test. The supplementary sensory stimulation provided by TENS did not alter the power of the models to explain the variance in the Baseline 6-min distance: Baseline, $R(2) = 0.85$; TENS, $R(2) = 0.83$. In contrast, TENS improved the explanatory power of the data obtained during the 2-min walk to account for the variance in the Baseline 6-min distance: no TENS, $R(2) = 0.40$; TENS, $R(2) = 0.64$. Logistic regression models based on force-plate and kinematic data obtained during the balance tasks were able to discriminate between the two groups with excellent certainty. The impact of TENS was greatest when older adults walked at a preferred speed but not when they walked at a brisk pace or performed tests of standing balance.

Language: en

Keywords

Postural sway; 6-min walk test; Inertial measurement units; Transcutaneous electrical nerve stimulation; Walking speed

Mortality, falls and slow walking speed are predicted by different muscle strength and physical performance measures in women and men

Zanker J, Scott D, Alajlouni D, Kirk B, Bird S, DeBruin D, Vogrin S, Bliuc D, Tran T, Cawthon P, Duque G, Center JR. Arch. Gerontol. Geriatr. 2023; 114: e105084.

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DOI 10.1016/j.archger.2023.105084 **PMID** 37290229

Abstract

BACKGROUND: Different measures of muscle strength, physical performance and body size/composition are used in various sarcopenia definitions. This study investigated which baseline measures best predict incident mortality and falls, and prevalent slow walking speed in older women and men.

MATERIALS AND METHODS: Data for 899 women (mean age \pm standard deviation, 68.7 \pm 4.3 years) and 497 men (69.4 \pm 3.9 years) from the Dubbo Osteoporosis Epidemiology Study 2, comprising sixty variables for muscle strength (quadriceps strength), physical performance (walking speed, timed up and go (TUG) test, sit to stand (STS) test), body size (weight, height, body mass index) and body composition (lean mass, body fat) were included. Sex-stratified Classification and Regression Tree (CART) analyses calculated baseline variable accuracy for predicting incident mortality and falls, and prevalent slow walking speed (<0.8 m/s).

RESULTS: Over 14.5 years, 103/899 (11.5%) women and 96/497 (19.3%) men died, 345/899 (38.4%) women and 172/497 (34.6%) men had ≥ 1 fall, and 304/860 (35.3%) women and 172/461 (31.7%) had baseline slow walking speed (<0.8 m/s). CART models identified age and walking speed adjusted for height as the most important predictors for mortality in women, and quadriceps strength (with adjustments) as the most important predictor for mortality in men. In both sexes, STS (with adjustments) was the most important predictor for incident falls, and TUG test was the most important predictor for prevalent slow walking speed. Body composition measures were not important predictors for any outcome.

CONCLUSIONS: Muscle strength and physical performance variables and cut points predict falls and mortality differently in women and men, suggesting targeted sex-specific application of selected measures may improve outcome prediction in older adults.

Language: en

Keywords

Mortality; Falls; Muscle strength; Physical performance; Sarcopenia

Neighborhood safety, fall indices, physical activity level and social participation restrictions from a population of community-dwelling older adults in Nsukka, Enugu State, Nigeria

Akosile CO, Ngwu NP, Okonkwo UP, Onwuakagba IU, Okoye EC. BMC Geriatr. 2023; 23(1): e358.

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DOI 10.1186/s12877-023-04059-x PMID 37291512

Abstract

BACKGROUND: Restriction in physical activity (PA) and social participation restriction (PR) can be heightened in the presence of fear of fall (FOF), fall experience, and perceived unsafe neighborhood, particularly among older adults. Despite the enormous benefits of social participation and physical activity, many older adults remain vulnerable to participation restriction and this probably accounts for a significant proportion of health challenges for older adults.

OBJECTIVE: This study investigated the relationship between neighborhood safety (NS), fall indices, physical activity, and social participation restriction among older adults from selected communities in Nsukka, Enugu state, Nigeria.

METHODS: This was a cross-sectional survey of 170 recruited via consecutive non-probability sampling techniques. Socio-demographic variables, co-morbidities, and fall prevalence were obtained using a self-administered questionnaire. The study instruments include the PA neighborhood environment scale - Nigeria (PANES-N), PA scale for elderly (PASE), Participation scale (PS), Modified fall efficacy scale (MFES), and Fall risk assessment tool (FRAT) and fall indices. **STATISTICAL ANALYSIS:** Descriptive statistics of mean and standard deviations, frequency counts, and percentages were used to analyze the socio-demographic variables, and Inferential statistics of Spearman rank order correlation were used to determine the relationship among the neighborhood safety, fall indices, physical activity level, and participation restrictions.

RESULTS: PR has a negative relationship with NS ($r = -0.19$, $p = 0.01$), and fall efficacy ($r = -0.52$, $p = 0.001$). However, PR has a positive relationship with fall risk ($r = 0.36$, $p = 0.001$).

CONCLUSION: Participation restriction is negatively correlated with neighborhood safety, fall efficacy, and PA. The PR has a positive relationship with fall risk (FR).

Language: en

Keywords

Physical activity; Fall risk; Older adults; Fall efficacy; Fall prevalence; Neighborhood safety; Social participation restriction

Number of medications and polypharmacy are associated with frailty in older adults: results from the Midlife in the United States Study

Alqahtani B. *Front. Public Health* 2023; 11: e1148671.

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Abstract

OBJECTIVES: The current study aimed to examine the association between the number of medications, polypharmacy, and frailty in community-dwelling older adults. In addition, the cutoff score for the number of medications related with frailty in this sample was determined.

METHODS: A cross-sectional analysis was performed using data of 328 individual aged between 65 and 85 years from the Midlife in the United States (MIDUS 2): Biomarker Project, 2004-2009, a multisite longitudinal study, for 328 individuals aged between 65 and 85 years. All the participants were categorized into two groups based on the number of medications used: no polypharmacy (n = 206) and polypharmacy (n = 122). The polypharmacy was defined as having 5 or more medication per day. Frailty status was measured using a modified form of Fried frailty phenotype through the presences of the following indicators include low physical activity; exhaustion; weight loss; slow gait speed and muscle weakness. Participants were categorized into three different groups based on total score: 0 as robust, 1 to 2 as prefrail, 3 or more as frail. The relationship between no. of medications, polypharmacy, and frailty was examined using a multinomial logistic regression model. The model was adjusted for age, sex, BMI, and no. of chronic conditions. Receiver operator characteristics and area under the curve were used to determine the cutoff number of medications.

RESULTS: Number of medications, and polypharmacy were associated with being frail (relative risk ratio [RRR]: 1.30; 95% confidence interval [CI]: [1.12, 1.50], p = 0.001), (RRR: 4.77; 95% CI [1.69, 13.4], p = 0.003), respectively. Number of medications with cutoff 6 medication or more was associated with being in frail category with sensitivity of 62% and specificity of 73%.

CONCLUSION: Polypharmacy was shown to be significantly related to frailty. A cutoff score of 6 or more medications distinguished frail from non-frail. Addressing polypharmacy in the older population might ameliorate the impact of physical frailty.

Language: en

Keywords

Humans; Cross-Sectional Studies; Exercise; aging; frailty; Longitudinal Studies; older; United States/epidemiology; polypharmacy; *Frailty/epidemiology; Independent Living; medications

Polypharmacy and cumulative anticholinergic burden in older adults hospitalized with fall

Wong HL, Weaver C, Marsh L, Mon KO, Dapito JM, Amin FR, Chauhan R, Mandal AKJ, Missouriis CG. *Aging Med. (Milton)* 2023; 6(2): 116-123.

(Copyright © 2023, John Wiley and Sons)

DOI 10.1002/agm2.12250 **PMID** 37287675

Abstract

INTRODUCTION: Polypharmacy is a growing phenomenon associated with adverse effects in older adults. We assessed the potential confounding effects of cumulative anticholinergic burden (ACB) in patients who were hospitalized with falls.

METHODS: A noninterventional, prospective cohort study of unselected, acute admissions aged ≥ 65 years. Data were derived from electronic patient health records.

RESULTS were analyzed to determine the frequency of polypharmacy and degree of ACB and their relationship to falls risk. Primary outcomes were polypharmacy, defined as prescription of 5 or more regular oral medications, and ACB score. **KEY RESULTS:** Four hundred eleven (411) consecutive subjects were included, mean age 83.8 ± 8.0 years: 40.6% men. There were 38.4% patients who were admitted with falls. Incidence of polypharmacy was 80.8%, (88.0% and 76.3% among those admitted with and without fall, respectively). Incidence of ACB score of 0, 1, 2, ≥ 3 was 38.7%, 20.9%, 14.6%, and 25.8%, respectively. On multivariate analysis, age [odds ratio (OR) = 1.030, 95% CI: 1.000 ~ 1.050, $P = 0.049$], ACB score (OR = 1.150, 95% CI: 1.020 ~ 1.290, $P = 0.025$), polypharmacy (OR = 2.140, 95% CI: 1.190 ~ 3.870, $P = 0.012$), but not Charlson Comorbidity Index (OR = 0.920, 95% CI: 0.810 ~ 1.040, $P = 0.172$) were significantly associated with higher falls rate. Of patients admitted with falls, 29.8% had drug-related orthostatic hypotension, 24.7% had drug-related bradycardia, 37.3% were prescribed centrally acting drugs, and 12.0% were taking inappropriate hypoglycemic agents.

CONCLUSION: Polypharmacy results in cumulative ACB and both are significantly associated with falls risk in older adults. The presence of polypharmacy and each unit rise in ACB score have a stronger effect of increasing falls risk compared to age and comorbidities.

Language: en

Keywords

fall; older; anticholinergic burden; outcomes; polypharmacy

Specialized care resources for diagnosis and management of patients who have suffered falls: results of a national survey in geriatric units

Bartolomé Martín I, Esteve Arrien A, Neira Álvarez M, Cristofori G, Cedeno-Veloz BA, Esbri Victor M, Pérez Pena B, González Ramírez A, Caballero-Mora M, Semeg OBOTFSGOSEM. *Int. J. Environ. Res. Public Health* 2023; 20(11).

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

DOI 10.3390/ijerph20115975 **PMID** 37297579

Abstract

INTRODUCTION: Clinical guidelines recommend comprehensive multifactorial assessment and intervention to prevent falls and fractures in older populations.

METHODS: A descriptive study was conducted by the Falls Study Group of the Spanish Geriatric Medicine Society (SEMEG) to outline which types of healthcare-specific resources were assigned for fall assessment in Spanish geriatric departments. A self-reported seven-item questionnaire was delivered from February 2019 to February 2020. Where geriatric medicine departments were not available, we tried to contact geriatricians working in those areas.

RESULTS: Information was obtained regarding 91 participant centers from 15 autonomous communities, 35.1% being from Catalonia and 20.8% from Madrid. A total of 21.6% reported a multidisciplinary falls unit, half of them in geriatric day hospitals. Half of them reported fall assessment as part of a general geriatric assessment in general geriatric outpatient clinics (49.5%) and, in 74.7% of cases, the assessment was based on functional tests. A total of 18.7% reported the use of biomechanical tools, such as posturography, gait-rides or accelerometers, for gait and balance analysis, and 5.5% used dual X-ray absorptiometry. A total of 34% reported research activity focused on falls or related areas. Regarding intervention strategies, 59% reported in-hospital exercise programs focused on gait and balance improvement and 79% were aware of community programs or the pathways to refer patients to these resources.

CONCLUSIONS: This study provides a necessary starting point for a future deep analysis. Although this study was carried out in Spain, it highlights the need to improve public health in the field of fall prevention, as well as the need, when implementing public health measures, to verify that these measures are implemented homogeneously throughout the territory. Therefore, although this analysis was at the local level, it could be useful for other countries to reproduce the model.

Language: en

Keywords

falls; older people; comprehensive geriatric assessment; falls clinic; healthcare resources

The application of internet of things for the elderly health safety: a systematic review

Dorri S, Zabolinezhad H, Sattari M. Adv. Biomed. Res. 2023; 12: e109.

(Copyright © 2023, Medknow Publications)

DOI 10.4103/abr.abr_197_22 **PMID** 37288027

Abstract

The elderly population is projected to increase from 8.5% in 2015 to 12% in 2030 and 16% in 2050. This growing demographic is chronically vulnerable to various age-related diseases and injuries like falling, leading to long-term pain, disability, or death. Thus, there is a need to use the potential of novel technologies to support the elderly regarding patient safety matters in particular. Internet of Things (IoT) has recently been introduced to improve the lifestyle of the elderly. This study aimed to evaluate the studies that have researched the use of the IoT for elderly patients' safety through performance metrics, accuracy, sensitivity, and specificity. We conducted a systematic review on the research question. To do this, we searched PubMed, EMBASE, Web of Science, Scopus, Google Scholar, and Science Direct databases by combining the related keywords. A data extraction form was used for data gathering through which English, full-text articles on the use of the IoT for the safety of elderly patients were included. The support vector machine technique has the most frequency of use compared to other techniques. Motion sensors were the most widely used type. The United States with four studies had the highest frequencies. The performance of IoT to ensure the elderly's safety was relatively good. It, however, needs to reach a stage of maturity for universal use.

Language: en

Keywords

Aged; Injuries; Internet of Things; Patient safety

The association between diuretics and falls in older adults: a systematic review and meta-analysis

Bai X, Han B, Zhang M, Liu J, Cui Y, Jiang H. *Geriatr. Nurs.* 2023; 52: 106-114.

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DOI 10.1016/j.gerinurse.2023.05.009 **PMID** 37290215

Abstract

OBJECTIVE: Diuretic intake increases the risk of falling. However, previous studies have shown inconsistent correlations between diuretics and falls. This meta-analysis aimed to provide a comprehensive overview of the relationship between diuretic use and risk of falls in older adult individuals.

METHODS: Six databases (Cochrane Library, PubMed, Medline, CINAHL, Web of Science, and EMBASE) were searched from their inception to November 9, 2022. The risk of bias was independently evaluated using the Newcastle-Ottawa Quality Assessment Scale. A comprehensive meta-analysis was used to analyze the eligible studies.

RESULTS: Fifteen articles were analyzed. Studies have shown that diuretics can increase the risk of falls in older adult individuals. The probability of falls in older adult individuals who used diuretics was 1.185 times higher than in those who did not take diuretics.

CONCLUSION: Diuretics were significantly associated with an increased risk of falls.

Language: en

Keywords

Systematic review; Meta-analysis; Fall; Diuretic; Older adult

Virtual fall program assessment for frail Canadian community-dwelling older adults: Examining equitable accessibility

Weiss SM, Castelo M, Liu B, Norris M. Digit. Health 2023; 9: e20552076231178410.

(Copyright © 2023, SAGE Publishing)

DOI 10.1177/20552076231178410 **PMID** 37312948

Abstract

OBJECTIVE: In response to COVID-19, the fall prevention program (FPP) at Sunnybrook Health Sciences Centre was modified to be delivered virtually. We compared patient populations assessed for the FPP virtually versus in-person to explore equitable accessibility.

METHODS: A retrospective chart review was performed. All patients assessed virtually from the beginning of the COVID-19 pandemic until the end of abstraction (April 25, 2022) were compared to a historic sample of patients assessed in-person beginning in January 2019. Demographics, measures of frailty, co-morbidity, and cognition were abstracted. Wilcoxon Rank Sum tests and Fisher's Exact tests were used for continuous and categorical variables, respectively.

RESULTS: Thirty patients were assessed virtually and compared to 30 in-person historic controls. Median age was 80 years (interquartile range 75-85), 82% were female, 70% were university educated, the median Clinical Frailty Score was 5 out of 9, and 87% used >5 medications. Once normalized, frailty scores showed no difference ($p = 0.446$). The virtual cohort showed significantly higher outdoor walking aid use ($p = 0.015$), reduced accuracy with clock drawing ($p = 0.020$), and nonsignificant trends toward using >10 medications, requiring assistance with >3 instrumental activities of daily living (IADLs), and higher treatment attendance. No significant differences were seen for time-to-treat ($p = 0.423$).

CONCLUSION: Patients assessed virtually were similarly frail as the in-person controls but had increased use of walking aids, medications, IADL assistance, and cognitive impairment. In a Canadian context, frail and high socioeconomic status older adults continued to access treatment through virtual FPP assessments during the COVID-19 pandemic highlighting both the benefits of virtual care and potential inequity.

Language: en

Keywords

prevention; elderly; eHealth; physical activity; technology; telehealth; medicine; exercise; Digital health; disease; lifestyle; telemedicine

Balance disorder trends in US adults 2008-2016: epidemiology and functional impact

Mitchell MB, Bhattacharyya N. OTO Open 2023; 7(2): e58.

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DOI 10.1002/oto2.58 PMID 37287493

Abstract

OBJECTIVE: To quantify the changes in prevalence and impact of dizziness and balance disorders in adults from 2008 to 2016. **STUDY DESIGN:** Epidemiological survey analysis. **SETTING:** United States.

METHODS: The balance modules of the adult 2008 and 2016 National Health Interview Surveys were examined, and persons reporting dizziness or balance problems identified. The prevalence of balance problems was determined and compared over time, adjusting for age and sex. Among those with balance problems, associated symptoms and self-reported functional limitations were quantified and compared over time.

RESULTS: In 2016, 36.8 ± 1.0 million ($15.5\% \pm 0.3\%$) adults reported a balance problem in the past year, versus 24.2 ± 0.7 million ($11.1\% \pm 0.3\%$) in 2008 ($p < .001$). After adjustment for age and sex, this percentage increase remained significant (odds ratio 1.435 [1.332-1.546], $p < .001$). Among those with balance problems, significantly more patients reported specific issues with feeling: off-balance (69.4% vs. 65.4%; $p = .005$), faint (48.5% vs. 40.3%; $p < .001$), or vertiginous (45.9% vs. 39.3%; $p < .001$) in 2016 than 2008. More adults experienced anxiety (29.4% vs. 19.4%; $p < .001$) and depression (16.3% vs. 12.9%; $p = .002$) with their balance problems in 2016 than in 2008. In 2016, adults with balance problems were limited in ability to drive motor vehicles (13.0%), exercise (14.4%), or walk downstairs (12.8%). These rates were not significantly different from 2008 (all $p > .05$).

CONCLUSION: In this nationally representative analysis, we found a significantly increasing prevalence of balance problems and associated psychiatric symptom burden. This merits attention with respect to present and future health care resource allocation.

Language: en

Keywords

epidemiology; depression; anxiety; balance disorder; dizziness; vertigo

Comparative study of the accuracy of at-point Clinical Frailty Scale and Morse Fall Scale in identifying high-risk fall patients among hospitalized adults

Ji S, Jung HW, Kim J, Kwon Y, Seo Y, Choi S, Oh HJ, Baek JY, Jang IY, Lee E. Ann. Geriatr. Med. Res. 2023; ePub(ePub): ePub.

(Copyright © 2023, Korean Geriatrics Society)

DOI 10.4235/agmr.23.0057 **PMID** 37305899

Abstract

BACKGROUND: Falls are a major concern among hospitalized adults, and it is essential to identify high-risk patients to prevent falls. This retrospective cohort study conducted at the Asan Medical Center, Korea, compared the screening abilities of the at-point Clinical Frailty Scale (CFS) and Morse Fall Scale (MFS) to identify patients at high risk for falls among hospitalized adults.

METHODS: We assessed the records of at-point CFS, MFS, and fall incidence during hospitalization of 2,028 patients aged 18 or older included in this study. We calculated the sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), and area under the curve (AUC) for each tool.

RESULTS: Twenty-five patients (1.23%) experienced falls during hospitalization. The mean at-point CFS score was significantly higher in those with falls than in those without falls. The mean MFS score did not differ significantly between the two groups. The optimal cutoff points for the at-point CFS and MFS scores were 5 and 45, respectively. At these cutoffs, the at-point CFS demonstrated a sensitivity of 76.0%, specificity of 54.0%, PPV of 2.0%, and NPV of 99.4%, whereas the MFS demonstrated a sensitivity of 60.0%, specificity of 68.1%, PPV of 2.2%, and NPV of 99.4%. The AUC values for the at-point CFS and MFS were 0.68 and 0.63, respectively, with no significant difference ($p = 0.31$).

CONCLUSION: The at-point CFS is a valid screening tool for assessing fall risk in hospitalized adults, as it effectively identifies fall risk with a performance similar to that of the MFS.

Language: en

Keywords

Accidental falls; Frailty; Patient safety

Diuretic use and risk of falls in older women with urinary incontinence

des Bordes J, Obimah R, Isbell T, Murdock C, Rianon N, Siddiqui G. *Geriatr. Nurs.* 2023; 52: 142-145.

(Copyright © 2023, Elsevier Publishing)

DOI 10.1016/j.gerinurse.2023.05.015 **PMID** 37301078

Abstract

OBJECTIVE: To determine the association between diuretic use and falls in community-dwelling older women with urinary incontinence (UI).

METHODS: We conducted an analytic cross-sectional study using patients' electronic medical records. Patients were women with UI, 65 years or older seen at a urogynecology clinic between January 1, 2018 and September 30, 2019. We used logistic regression analysis to explore the associations between falls and diuretic use.

RESULTS: The study included 108 women, mean age of 75.2 ± 7.5 years. Twenty-two (20%) reported one or more falls within the past year and 32 (30%) were diuretic users. Fall prevalence in diuretic users and non-users were 25% (8/32) and 18.4% (14/76), respectively. Diuretic use was not associated with falls (OR = 0.74, 95%CI = 0.22-2.52). Post-hoc analysis revealed inadequate sample size.

CONCLUSIONS: Diuretics use may not be a risk factor for falls in ambulatory older women with UI. A larger sample will be needed to confirm.

Language: en

Keywords

Falls; Urinary incontinence; Diuretic use; Older women

Fall direction detection in motion state based on the FMCW radar

Ma L, Li X, Liu G, Cai Y. Sensors (Basel) 2023; 23(11).

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Abstract

Accurately detecting falls and providing clear directions for the fall can greatly assist medical staff in promptly developing rescue plans and reducing secondary injuries during transportation to the hospital. In order to facilitate portability and protect people's privacy, this paper presents a novel method for detecting fall direction during motion using the FMCW radar. We analyze the fall direction in motion based on the correlation between different motion states. The range-time (RT) features and Doppler-time (DT) features of the person from the motion state to the fallen state were obtained by using the FMCW radar. We analyzed the different features of the two states and used a two-branch convolutional neural network (CNN) to detect the falling direction of the person. In order to improve the reliability of the model, this paper presents a pattern feature extraction (PFE) algorithm that effectively eliminates noise and outliers in RT maps and DT maps. The experimental results show that the method proposed in this paper has an identification accuracy of 96.27% for different falling directions, which can accurately identify the falling direction and improve the efficiency of rescue.

Language: en

Keywords

dual-branch convolutional neural network; fall direction detection; FMCW radar; pattern feature extraction

Impact of COVID-19 on clinical education for occupational therapy students: a 3-year longitudinal study on fall risk prediction ability

Matsushita W, Arihisa K, Miyaguchi H, Ohura T, Kishita R, Ishizuki C. *Occup. Ther. Health Care* 2023; ePub(ePub): ePub.

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Abstract

This study aimed to examine if there were disadvantages to student learning and application when clinical education is canceled due to factors such as COVID-19 pandemic that occurred between 2020-2021. Forty occupational therapy students participated in the study, and they were classified into two groups: those with clinical education (clinical education group) and those without clinical education (inexperienced group). TP-KYT, which assesses a client's ability to predict risk related to falls, was administered in the first and final year. The inexperienced group showed less ability to predict risk related to client falls than the clinical education group.

Language: en

Keywords

COVID-19; occupational therapy; Clinical education; risk prediction

The methods of fall detection: a literature review

Newaz NT, Hanada E. Sensors (Basel) 2023; 23(11).

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DOI 10.3390/s23115212 **PMID** 37299939

Abstract

Fall Detection Systems (FDS) are automated systems designed to detect falls experienced by older adults or individuals. Early or real-time detection of falls may reduce the risk of major problems. This literature review explores the current state of research on FDS and its applications. The review shows various types and strategies of fall detection methods. Each type of fall detection is discussed with its pros and cons. Datasets of fall detection systems are also discussed. Security and privacy issues related to fall detection systems are also considered in the discussion. The review also examines the challenges of fall detection methods. Sensors, algorithms, and validation methods related to fall detection are also talked over. This work found that fall detection research has gradually increased and become popular in the last four decades. The effectiveness and popularity of all strategies are also discussed. The literature review underscores the promising potential of FDS and highlights areas for further research and development.

Language: en

Keywords

machine learning; IoT; biomedical signals; cloud; fall detection systems (FDS); fall detection types; FDS future scope; kinematic signals

Comment on "Comparison of the relationship between cognitive function and future falls in Chinese community-dwelling older adults with and without diabetes mellitus"

Hao K, Liu X, Li L. J. Formos. Med. Assoc. 2023; ePub(ePub): ePub.

(Copyright © 2023, Scientific Communications International)

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Abstract

A recent study¹ conducted on Chinese community-dwelling older adults, both with and without diabetes mellitus, has shed light on an important aspect of their health: the association between cognitive function and future falls. This research provides valuable insights into the intricate relationship between cognitive function, diabetes mellitus, and the risk of falls. By employing a comprehensive approach, the study examined a cohort of community-dwelling older adults in China, aiming to unravel potential correlations between cognitive function, diabetes, and the likelihood of experiencing falls in the future. The findings from this research hold particular relevance for healthcare professionals, researchers, and policymakers involved in geriatric care. While this research provides important insights into this subject matter, we believe there are certain aspects that warrant further discussion and consideration.

Firstly, it is essential to consider additional factors that contribute to falls in older adults, particularly those with diabetes. This study appropriately recognizes the association between cognitive function and falls in older adults. However, it is worth emphasizing that falls are multifactorial events influenced by various factors beyond cognitive function alone. Neglecting to account for these factors may limit the study's ability to provide a comprehensive understanding of fall risk in older adults with diabetes mellitus. One notable factor is diabetic retinopathy,² a common complication of diabetes that affects the eyes and can lead to vision impairment. Impaired vision significantly impacts an individual's ability to detect obstacles and navigate their environment, increasing the risk of falls.² Thus, exploring the relationship between diabetic retinopathy and fall risk would provide valuable insights into strategies for preventing falls in older adults with diabetes.

Secondly, this study could have considered the impact of osteoporosis, a condition characterized by reduced bone density, on fall risk. Older adults with diabetes mellitus are at an increased risk of developing osteoporosis due to factors such as chronic hyperglycemia and the use of certain medications.³ Osteoporosis weakens bone structure, making individuals more susceptible to fractures and falls. Therefore, including an assessment of osteoporosis and its contribution to fall risk would enhance the study's comprehensiveness.

Thirdly, muscle weakness and balance impairments are ...

Language: en