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A combined one-class SVM and template-matching approach for user-aided human fall detection by means of floor acoustic features

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Comput. Intell. Neurosci. 2017; 2017: e1512670.

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DOI 10.1155/2017/1512670 **PMID** 28638405 **PMCID** PMC5468803

Abstract

The primary cause of injury-related death for the elders is represented by falls. The scientific community devoted them particular attention, since injuries can be limited by an early detection of the event. The solution proposed in this paper is based on a combined One-Class SVM (OCSVM) and template-matching classifier that discriminate human falls from nonfalls in a semisupervised framework. Acoustic signals are captured by means of a Floor Acoustic Sensor; then Mel-Frequency Cepstral Coefficients and Gaussian Mean Supervectors (GMSs) are extracted for the fall/nonfall discrimination. Here we propose a single-sensor two-stage user-aided approach: in the first stage, the OCSVM detects abnormal acoustic events. In the second, the template-matching classifier produces the final decision exploiting a set of template GMSs related to the events marked as false positives by the user. The performance of the algorithm has been evaluated on a corpus containing human falls and nonfall sounds. Compared to the OCSVM only approach, the proposed algorithm improves the performance by 10.14% in clean conditions and 4.84% in noisy conditions. Compared to Popescu and Mahnot (2009) the performance improvement is 19.96% in clean conditions and 8.08% in noisy conditions.

PDF Y Endnote Y

An energy-efficient multi-tier architecture for fall detection using smartphones

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Sensors (Basel) 2017; 17(7): s17071487.

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Abstract

Automatic detection of fall events is vital to providing fast medical assistance to the causality, particularly when the injury causes loss of consciousness. Optimization of the energy consumption of mobile applications, especially those which run 24/7 in the background, is essential for longer use of smartphones. In order to improve energy-efficiency without compromising on the fall detection performance, we propose a novel 3-tier architecture that combines simple thresholding methods with machine learning algorithms. The proposed method is implemented on a mobile application, called uSurvive, for Android smartphones. It runs as a background service and monitors the activities of a person in daily life and automatically sends a notification to the appropriate authorities and/or user defined contacts when it detects a fall. The performance of the proposed method was evaluated in terms of fall detection performance and energy consumption. Real life performance tests conducted on two different models of smartphone demonstrate that our 3-tier architecture

with feature reduction could save up to 62% of energy compared to machine learning only solutions. In addition to this energy saving, the hybrid method has a 93% of accuracy, which is superior to thresholding methods and better than machine learning only solutions.

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Analysis of public datasets for wearable fall detection systems

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Sensors (Basel) 2017; 17(7): s17071513.

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Abstract

Due to the boom of wireless handheld devices such as smartwatches and smartphones, wearable Fall Detection Systems (FDSs) have become a major focus of attention among the research community during the last years. The effectiveness of a wearable FDS must be contrasted against a wide variety of measurements obtained from inertial sensors during the occurrence of falls and Activities of Daily Living (ADLs). In this regard, the access to public databases constitutes the basis for an open and systematic assessment of fall detection techniques. This paper reviews and appraises twelve existing available data repositories containing measurements of ADLs and emulated falls envisaged for the evaluation of fall detection algorithms in wearable FDSs. The analysis of the found datasets is performed in a comprehensive way, taking into account the multiple factors involved in the definition of the testbeds deployed for the generation of the mobility samples. The study of the traces brings to light the lack of a common experimental benchmarking procedure and, consequently, the large heterogeneity of the datasets from a number of perspectives (length and number of samples, typology of the emulated falls and ADLs, characteristics of the test subjects, features and positions of the sensors, etc.). Concerning this, the statistical analysis of the samples reveals the impact of the sensor range on the reliability of the traces. In addition, the study evidences the importance of the selection of the ADLs and the need of categorizing the ADLs depending on the intensity of the movements in order to evaluate the capability of a certain detection algorithm to discriminate falls from ADLs.

PDF Y Endnote Y

Assessment of fall characteristics from depth sensor videos

O'Connor JJ, Phillips LJ, Folarinde B, Alexander GL, Rantz M.

J. Gerontol. Nurs. 2017; 43(7): 13-19.

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DOI 10.3928/00989134-20170614-05 **PMID** 28651031

Abstract

Falls are a major source of death and disability in older adults; little data, however, are available about the etiology of falls in community-dwelling older adults. Sensor systems installed in independent and assisted living residences of 105 older adults participating in an ongoing technology study were programmed to record live videos of probable fall events. Sixty-four fall video segments from 19 individuals were viewed and rated using the Falls Video Assessment Questionnaire. Raters identified that 56% (n = 36) of falls were due to an incorrect shift of body

weight and 27% (n = 17) from losing support of an external object, such as an unlocked wheelchair or rolling walker. In 60% of falls, mobility aids were in the room or in use at the time of the fall. Use of environmentally embedded sensors provides a mechanism for real-time fall detection and, ultimately, may supply information to clinicians for fall prevention interventions. [Journal of Gerontological Nursing, 43(7), 13-19.].

PDF N Endnote Y

Association between subjective sleep quality and future risk of falls in older people: results from LOHAS

Takada S, Yamamoto Y, Shimizu S, Kimachi M, Ikenoue T, Fukuma S, Onishi Y, Takegami M, Yamazaki S, Ono R, Sekiguchi M, Otani K, Kikuchi SI, Konno SI, Fukuhara S.

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(Copyright © 2017, Gerontological Society of America)

DOI 10.1093/gerona/glx123 **PMID** 28633472

Abstract

BACKGROUND: Inadequate sleep is correlated with morbidity and mortality among older adults. However, the longitudinal relationship between subjective sleep quality and risk of falls in the elderly remains to be clarified.

METHODS: Study participants were from Locomotive Syndrome and Health Outcome in Aizu Cohort Study (LOHAS) sites (1071 community-dwelling people ≥ 65 years of age, mean, 71 years). Subjective sleep quality was measured by the Pittsburgh Sleep Quality Index (PSQI). Occurrence of falls (defined as experiencing at least one fall) during the subsequent year was ascertained by a self-reported questionnaire.

RESULTS: Mean global PSQI score was 4.3 (standard deviation, 3.2), with 28.9% of participants rating their sleep quality as poor (PSQI>5). A total of 210 participants (19.6%) fell at least once in the year following sleep examination. Multivariable analysis revealed that participants reporting worse subjective sleep quality had significantly higher odds of experiencing falls during the one-year follow-up period (adjusted odds ratio (AOR)=1.50 for each three point increase in global PSQI score; 95% confidence interval (CI)=1.20, 1.89). Participants in the highest global PSQI score (PSQI>5) quartile had significantly increased odds of experiencing falls compared to those in the lowest global score quartile (PSQI<2; AOR=2.14; 95% CI=1.09, 4.22). This association was similarly significant in subgroup analyses for older men and women, non-users of sleep medication, and those without a history of falls at baseline.

CONCLUSION: Subjective poor sleep quality, as measured by the PSQI, is longitudinally associated with greater risk of experiencing falls in community-dwelling older adults.

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Associations between cerebral amyloid and changes in cognitive function and falls risk in subcortical ischemic vascular cognitive impairment

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BMC Geriatr. 2017; 17(1): e133.

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Abstract

BACKGROUND: To determine the association between amyloid-beta ($A\beta$) plaque deposition and changes in global cognition, executive functions, information processing speed, and falls risk over a 12-month period in older adults with a primary clinical diagnosis of subcortical ischemic vascular cognitive impairment (SIVCI).

METHODS: This is a secondary analysis of data acquired from a subset of participants ($N = 22$) who were enrolled in a randomized controlled trial of aerobic exercise (NCT01027858). The subset of individuals completed an (11)C Pittsburgh compound B (PIB) scan. Cognitive function and falls risk were assessed at baseline, 6-months, and 12-months. Global cognition, executive functions, and information processing speed were measured using: 1) ADAS-Cog; 2) Trail Making Test; 3) Digit Span Test; 4) Stroop Test, and 5) Digit Symbol Substitution Test. Falls risk was measured using the Physiological Profile Assessment. Hierarchical multiple linear regression analyses determined the unique contribution of $A\beta$ on changes in cognitive function and falls risk at 12-months after controlling for experimental group (i.e. aerobic exercise training or usual care control) and baseline performance. To correct for multiple comparisons, we applied the Benjamini-Hochberg procedure to obtain a false discovery rate corrected threshold using $\alpha = 0.05$.

RESULTS: Higher PIB retention was significantly associated with greater decrements in set shifting (Trail Making Test, adjusted $R(2) = 35.3\%$, $p = 0.002$), attention and conflict resolution (Stroop Test, adjusted $R(2) = 33.4\%$, $p = 0.01$), and information processing speed (Digit Symbol Substitution Test, adjusted $R(2) = 24.4\%$, $p = 0.001$) over a 12-month period. Additionally, higher PIB retention was significantly associated with increased falls risk (Physiological Profile Assessment, adjusted $R(2) = 49.1\%$, $p = 0.04$). PIB retention was not significantly associated with change in ADAS-Cog and Verbal Digit Span Test ($p > 0.05$).

CONCLUSIONS: Symptoms associated with SIVCI may be amplified by secondary $A\beta$ pathology. TRIAL REGISTRATION: ClinicalTrials.gov, NCT01027858, December 7, 2009.

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Blood pressure, antihypertensive polypharmacy, frailty, and risk for serious fall injuries among older treated adults with hypertension

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Hypertension 2017; 70(2): 259-266.

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Abstract

Antihypertensive medication and low systolic blood pressure (BP) and diastolic BP have been associated with an increased falls risk in some studies. Many older adults have indicators of frailty, which may increase their risk for falls. We contrasted the association of systolic BP, diastolic BP, number of antihypertensive medication classes taken, and indicators of frailty with risk for serious fall injuries among 5236 REGARDS study (Reasons for Geographic and Racial Difference in Stroke)

participants ≥ 65 years taking antihypertensive medication at baseline with Medicare fee-for-service coverage. Systolic BP and diastolic BP were measured, and antihypertensive medication classes being taken assessed through a pill bottle review during a study visit. Indicators of frailty included low body mass index, cognitive impairment, depressive symptoms, exhaustion, impaired mobility, and history of falls. Serious fall injuries were defined as fall-related fractures, brain injuries, or joint dislocations using Medicare claims through December 31, 2014. Over a median of 6.4 years, 802 (15.3%) participants had a serious fall injury. The multivariable-adjusted hazard ratio for a serious fall injury among participants with 1, 2, or ≥ 3 indicators of frailty versus no frailty indicators was 1.18 (95% confidence interval, 0.99-1.40), 1.49 (95% confidence interval, 1.19-1.87), and 2.04 (95% confidence interval, 1.56-2.67), respectively. Systolic BP, diastolic BP, and number of antihypertensive medication classes being taken at baseline were not associated with risk for serious fall injuries after multivariable adjustment. In conclusion, indicators of frailty, but not BP or number of antihypertensive medication classes, were associated with increased risk for serious fall injuries among older adults taking antihypertensive medication.

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Comparison of fall-related traumatic brain injury in residential aged care and community-dwelling older people: a population-based study

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Australas. J. Ageing 2017; 36(2): 144-150.

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DOI 10.1111/ajag.12422 **PMID** 28635089

Abstract

OBJECTIVE: To compare trends, causes, and outcomes of fall-related traumatic brain injury (TBI) between community-dwelling (CD) individuals and residential aged care facility (RACF) residents.

METHODS: Hospitalisation and RACF administrative data for 6635 individuals aged ≥ 65 years admitted to all NSW hospitals for fall-related TBI from 2008-2009 to 2012-2013 were linked.

RESULTS: Of the 6944 hospitalisations, 20.8% were for RACF residents. Age-standardised hospitalisation rates were almost fourfold higher for RACF residents than CD individuals (standardised rate ratio 3.7; 95% CI 3.4-4.1); but increased at a similar annual rate of 9.2% (95% CI 0.3-19.0) and 7.2% (95% CI 5.6-8.9), respectively. Compared to CD individuals: a higher proportion of falls in RACF residents were furniture-related (21.4% vs 9.9%); resulted in haemorrhage (82.5% vs 73.7%); and death (23.1% vs 14.9%). Overall, 7.7% of hospitalisations for CD individuals resulted in new permanent RACF placement.

CONCLUSION: Residential aged care facility residents have higher hospitalisation rates and poorer health outcomes than their CD counterparts.

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Cost of osteoporotic fractures in Singapore

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Value Health Reg. Issues 2017; 12: 27-35.

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DOI 10.1016/j.vhri.2016.12.002 **PMID** 28648313

Abstract

OBJECTIVES: To estimate the 3-month direct and indirect costs associated with osteoporotic fractures from both the hospital's and patient's perspectives in Singapore and to compare the cost between acute and prevalent osteoporotic fractures.

METHODS: Resource use and expenditure data were collected using interviewer-administered questionnaires at baseline and at a 3-month follow-up between July 2013 and January 2014.

Estimated osteoporotic fracture-related costs included hospitalizations, accident and emergency room visits, outpatient physician visits, laboratory tests, medications, transportation, health care and community services, special equipment and home/car modifications, and productivity loss.

RESULTS: A total of 67 patients agreed to participate, giving a response rate of 64.4%. The mean (median) 3-month direct medical cost from the hospital's perspective was found to be SGD 3,886.90 (SGD 413.10), of which 74.2% was accounted for by inpatient services, 25.2% by outpatient services, and 0.6% by accident and emergency services. Moreover, considerable variation (SD = SGD 2,615.40) was observed in the costs of outpatient rehabilitation services.

FINDINGS were similar when the patient's perspective was taken. The total costs, with both direct and indirect costs included, were SGD 11,438.70 (acute) and SGD 1,015.40 (prevalent), of which 34.7% and 8.0%, respectively, were accounted for by inpatient services.

CONCLUSIONS: Hospitalization was associated with the highest cost borne by both the hospital and the patient, and informal care dominated indirect costs. Better knowledge of the financial consequences of fragility fractures could enable proactive and preventive measures to be undertaken, especially at sites of care with high cost drivers.

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Development and validation of a Fall Risk Assessment Index for dialysis patients

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Clin. Exp. Nephrol. 2017; ePub(ePub): ePub.

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DOI 10.1007/s10157-017-1431-8 **PMID** 28634773

Abstract

BACKGROUND: Dialysis patients often have low physical performance due to uremic sarcopenia, protein energy wasting (PEW), and incidence intradialytic hypotension (IDH), which are indicated as risk factors for falling. The objective of this study was to develop a symptom-encompassing evaluation form to predict falls with high sensitivity for dialysis patients.

METHODS: A total of 251 patients who had been receiving maintenance hemodialysis therapy three times a week were enrolled in the study. Demographics, malnutrition and inflammatory status, dialytic therapeutic management situation, physical function and performance, and inquiries about falling were recorded. The Cox proportional hazards analysis evaluated the impact of falls. Calculated

hazard ratios were converted to weighted scores, using approximate multiples of 0.5 and an evaluation form was created, which we called the Dialysis Fall Risk Index (DFRI). Kaplan-Meier survival analyses with the log-rank test and the Cox proportional hazard analysis were performed to evaluate the validity of the DFRI.

RESULTS: The DFRI consisted of seven items and a total of 12 points. The predictive validity of DFRI included hazard ratios for quartile 3 and 4 of 2.65 and 3.84, respectively, compared with quartile 1 as a reference point. The cut-off point of the DFRI showed the highest sensitivity and specificity among other screening indices.

DISCUSSION: The present study included the development of a new evaluation form that encompasses symptoms of end-stage kidney disease to predict falls in dialysis patients.

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Examination of the psychometric properties of the geriatric fear of falling measure among community-dwelling older adults in the United States

Chen TY, Edwards JD, Janke M.

J. Appl. Gerontol. 2017; ePub(ePub): ePub.

Affiliation: East Carolina University, Greenville, NC, USA.

(Copyright © 2017, Sage Publications)

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Abstract

This current study investigated the construct validity and reliability of the Geriatric Fear of Falling Measure (GFFM) among community-dwelling older adults in the United States. Eighty-eight participants were assessed on the GFFM together with demographics, falls, and fear of falling and falls-efficacy measures at baseline and an 8-week follow-up visit. Cronbach's alpha, regression analyses, and correlation analyses were used to examine the psychometric properties of the GFFM. The results showed that the GFFM demonstrated good construct validity and reliability among community-dwelling older adults in the United States. Our findings provide evidence for the validity and reliability of the GFFM. Further study with a larger and diverse sample is needed to determine whether the GFFM has potential as a quick screening tool of fear of falling in clinical settings.

PDF Y Endnote Y

Factors predicting falls and mobility outcomes in patients with stroke returning home after rehabilitation who are at risk of falling

Ng MM, Hill KD, Batchelor F, Burton E.

Arch. Phys. Med. Rehabil. 2017; ePub(ePub): ePub.

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(Copyright © 2017, Elsevier Publishing)

DOI 10.1016/j.apmr.2017.05.018 **PMID** 28647551

Abstract

OBJECTIVE: To identify factors predicting falls and limited mobility in people with stroke at 12 months after returning home from rehabilitation.

DESIGN: Observational cohort study with 12 month follow-up.

SETTING: Community.

PARTICIPANTS: People with stroke (n=144) and increased falls risk discharged home from rehabilitation.

INTERVENTIONS: Not applicable.

MAIN OUTCOME MEASURES: Falls were measured using monthly calendars completed by participants, and mobility was assessed using gait speed over five metres (high mobility (>0.8m/s) versus low mobility (\leq 0.8m/s). Both measures were assessed at 12 months post-discharge.

Demographics and functional measures including balance, strength, visual or spatial deficits, disability, physical activity level, executive function, functional independence and falls risk were analysed to determine factors significantly predicting falls and mobility levels after 12 months.

RESULTS: Those assessed as being at high falls risk (Falls Risk for Older People in the Community (FROP-Com) score \geq 19) were 4.5 times more likely to fall by 12 months (OR:4.506, 95% CI:1.71-11.86, p-value:0.002). Factors significantly associated with lower usual gait speed (<0.8m/s) at 12 months in the multivariable analysis were age (OR:1.07, 95% CI=1.01-1.14, p-value=0.033), physical activity (OR:1.09, 95% CI =1.03-1.17, p-value=0.007) and functional mobility (OR:0.83, 95% CI =0.75-0.93, p-value=0.001).

CONCLUSION: Several factors predicted falls and limited mobility for patients with stroke 12 months after rehabilitation discharge. These results suggest that clinicians should include assessment of falls risk (FROP-Com), physical activity, and dual task Timed Up and Go during rehabilitation to identify those most at risk of falling and experiencing limited mobility outcomes at 12 months, and target these areas during in-patient and out-patient rehabilitation to optimise long term outcomes.

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Failure of falls risk screening tools to predict outcome: a prospective cohort study

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Emerg. Med. J. 2017; ePub(ePub): ePub.

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DOI 10.1136/emered-2016-206233 **PMID** 28642373

Abstract

OBJECTIVE: To compare the Falls Risk for Older Persons-Community Setting Screening Tool (FROP Com Screen) with the Two-Item Screening Tool in older adults presenting to the ED.

METHODS: A prospective cohort study, comparing the efficacy of the two falls risk assessment tools by applying them simultaneously in a sample of hospital ED presentations.

RESULTS: Two hundred and one patients over 65 years old were recruited. Thirty-six per cent reported falls in the 6-month follow-up period. The area under the receiver operating characteristic curve was 0.57 (95% CI 0.48 to 0.66) for the FROP Com Screen and 0.54 (95% CI 0.45 to 0.63) for the Two-Item Screening Tool. FROP Com Screen had a sensitivity of 39% (95% CI 0.27 to 0.51) and a specificity of 70% (95% CI 0.61 to 0.78), while the Two-Item Screening Tool had a sensitivity of 48% (95% CI 0.36 to 0.60) and a specificity of 57% (95% CI 0.47 to 0.66).

CONCLUSION: Both tools have limited predictive ability in the ED setting.

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Fall-related hospitalisations of older Aboriginal and Torres Strait Islander people and other Australians

Lukaszyk C, Harvey LA, Sherrington C, Close JC, Coombes J, Mitchell RJ, Moore R, Ivers R.

Med. J. Aust. 2017; 207(1): 31-35.

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(Copyright © 2017, Australian Medical Association, Publisher Australasian Medical Publishing)

DOI unavailable **PMID** 28659112

Abstract

OBJECTIVES: To compare the socio-demographic characteristics and type of injury sustained, the use of hospital resources and rates of hospitalisation by injury type, and survival following fall injuries to older Aboriginal people and non-Indigenous Australian people hospitalised for fall-related injuries.

DESIGN: Population-based retrospective cohort data linkage study. Setting, participants: New South Wales residents aged 50 years or more admitted to a public or private NSW hospital for a fall-related injury during 1 January 2003 - 31 December 2012.

MAIN OUTCOME MEASURES: Proportions of patients with defined injury types, mean hospital length of stay (LOS), 30-day mortality, age-standardised hospitalisation rates and age-adjusted rate ratios, 28-day re-admission rates.

RESULTS: There were 312 758 fall-related injury hospitalisations for 234 979 individuals; 2660 admissions (0.85%) were of Aboriginal people. The proportion of hospitalisations for fall-related fracture injuries was lower for Aboriginal than for non-Indigenous Australians (49% v 60% of fall-related hospitalisations; $P < 0.001$). The major injury type for Aboriginal patients was non-fracture injury to head or neck (19% of hospitalisations); for non-Indigenous patients it was hip fractures (18%). Age-adjusted LOS was lower for Aboriginal than for non-Indigenous patients (9.1 v 14.0 days; $P < 0.001$), as was 30-day mortality (2.9% v 4.2%; $P < 0.001$). For Aboriginal people, fall injury hospitalisations increased at an annual rate of 5.8% (95% CI, 4.0-7.7%; $P < 0.001$); for non-Indigenous patients, the mean annual increase was 2.5% (95% CI, 2.1-3.0; $P < 0.001$).

CONCLUSIONS: The patterns of injury and outcomes of fall injury hospitalisations were different for older Aboriginal people and other older Australians, suggesting that different approaches are required to prevent and treat fall injuries.

PDF Y Endnote Y

Falling direction can predict the mechanism of recurrent falls in advanced Parkinson's disease

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Sci. Rep. 2017; 7(1): e3921.

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(Copyright © 2017, Nature Publishing Group)

DOI 10.1038/s41598-017-04302-7 **PMID** 28634343 **PMCID** PMC5478627

Abstract

Falls are a common and disabling symptom in patients with Parkinson's disease (PD). For prevention, it is important to understand the pathophysiology of falls in PD patients, but the predictors for the possible mechanisms underlying such falls have not been clearly elucidated. In this prospective observational study, we investigated the implications of falling direction to predict the mechanisms of recurrent falls in PD patients. We enrolled 62 recurrent fallers with PD and divided them into two groups according to the main falling directions: 45 PD fallers who fell forward (forward fallers), and

17 PD fallers who fell in the other directions (non-forward fallers). Although there was no difference in demographic data, parkinsonism, or frontal lobe function, forward fallers showed more severe falls and tended to fall during walking or turning, while non-forward fallers usually fell during sitting/standing or turning. Additionally, forward fallers revealed higher score on a freezing of gait (FOG) questionnaire. Logistic regression analysis demonstrated that FOG was associated with falling forward, while balance impairment, akinetic-rigid subtype, and neuropsychiatric symptoms were associated with falling into the other directions. Our results indicate that FOG and balance impairment are two major mechanisms for recurrent falling in PD patients, and falling direction is an important predictor for these mechanisms.

PDF Y Endnote Y

Falls risk assessments: too much, too little or just right?

Su G.

Appl. Nurs. Res. 2017; 36: 135-136.

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Abstract [Abstract unavailable] Guest editorial

PDF Y Endnote Y

Fear and risk of falling, activities of daily living, and quality of life: assessment when older adults receive emergency department care

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Nurs. Res. 2017; 66(4): 330-335.

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DOI 10.1097/NNR.0000000000000227 **PMID** 28654570

Abstract

BACKGROUND: Falls tend to create fear and concern in older adults who also seek care in emergency departments (EDs) at high rates.

AIM: The purposes of this study were to (a) describe risk and fear of falling in older adults seeking care in the ED and (b) explore relationships between risk and fear of falling with activities of daily living and quality of life.

METHODS: The study was conducted in the ED of Ondokuz Mayıs University Hospital in Samsun, Turkey. Data were collected for 7 months in 2013-2014. Adults aged 65 years and above who scored at least 20 on the Standardized Mini-Mental Test and who presented for care in the ED were eligible to take part. Patients self-reported demographic information and completed the Tinetti Falls Efficacy Scale, the Morse Fall Scale, the Nottingham Health Profile (NHP), and the Modified Barthel Index (MBI).

RESULTS: A total of 151 older adults took part. Prevalence of falls was high (48.3%), as well as fear of falling (63.6%). Risk of falling (Morse Fall Scale scores) was negatively correlated with the ability to carry out activities of daily living (MBI scores; $r = -.50$, $p < .001$) and positively related to scores on the NHP ($r = .45$, $p < .001$); likewise, fear of falling (Falls Efficacy Scale scores) was negatively correlated with the ability to carry out activities of daily living (MBI scores; $r = -.79$, $p < .001$) and positively

correlated with NHP scores ($r = .64, p < .001$).

DISCUSSION: Older adults seeking care in the ED who have a higher risk of falling are more dependent in daily living activities and experience lower quality of life. Care seeking in the ED offers an opportunity to assess fall risk and fear of falling and provide guidance on prevention and management of falls in older adults.

PDF N Endnote Y

Fear of falling and gait parameters in older adults with and without fall history

Makino K, Makizako H, Doi T, Tsutsumimoto K, Hotta R, Nakakubo S, Suzuki T, Shimada H.

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DOI 10.1111/ggi.13102 **PMID** 28656737

Abstract

AIM: Fear of falling (FOF) is associated with spatial and temporal gait parameters in older adults. FOF is prevalent among older adults, both those with and without fall history. It is still unclear whether the relationships between FOF and gait parameters are affected by fall history. The aim of the present study was to compare gait parameters by the presence of FOF and fall history.

METHODS: A total of 3575 older adults (mean age 71.7 years, 49.7% female) met the inclusion criteria for the present study. We assessed the presence of fall history and FOF by face-to-face interview, and gait parameters (gait speed, stride length, step rate, double support time and variation of stride length) at a comfortable speed using a computerized electronic walkway.

RESULTS: Prevalences of fall history and FOF were as follows: non-fallers without FOF 52.6% ($n = 1881$); fallers without FOF 6.3% ($n = 227$); non-fallers with FOF 34.4% ($n = 1229$); and fallers with FOF 6.7% ($n = 238$). Analysis of covariance showed significant differences among the four groups in all gait variables even after adjusting for age, sex and number of medications used. It should be noted that non-fallers with FOF showed significantly slower gait speed, shorter stride length and longer double support time than did non-fallers without FOF ($P < 0.001$).

CONCLUSIONS: The present results suggest that spatial and temporal gait parameters are influenced by FOF, even in the absence of fall history. The assessment of FOF might be helpful for better understanding of age-related changes in gait control.

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PDF Y Endnote Y

Home modifications among community-dwelling older adults: a closer look at race and ethnicity

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J. Gerontol. Soc. Work 2017; ePub(ePub): ePub.

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(Copyright © 2017, Informa - Taylor and Francis Group)

DOI 10.1080/01634372.2017.1341444 **PMID** 28657880

Abstract

Home modification is an intervention that can improve functional performance and lower injury or fall risk. This study investigated racial and ethnic disparities in modification use among Medicare

beneficiaries aged 65 and older, and factors that can account for differences in utilization. Data from the 2011 National Health and Aging Trends Study were used ($n = 6,764$). Logistic regression was used to examine the relationship between race, ethnicity, and three bathroom modification measures, and whether predisposing, need, and enabling factors account for utilization differences. Compared with older non-Hispanic Whites, Hispanics were less likely to have a grab bar (odds ratio (OR) = 0.6), bath seat (OR = 0.8), or raised toilet/raised toilet seat (OR = 0.6). Non-Hispanic Blacks were less likely to have a grab bar (OR = 0.7) or bath seat (OR = 0.7) than non-Hispanic Whites, but more likely to have a raised toilet/raised toilet seat (OR = 1.3). Ethnic differences were largely explained by English proficiency, and health status partially accounted for racial disparities. Differences in home modification use among racial and ethnic minority groups highlight the need for community-based education, communication, policies, and services that increase knowledge of and access to these critical supports.

PDF Y Endnote Y

Home-based exercise program improves balance and fear of falling in community-dwelling older adults with mild Alzheimer's disease: a pilot study

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J. Alzheimers Dis. 2017; ePub(ePub): ePub.

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(Copyright © 2017, IOS Press)

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Abstract

BACKGROUND/OBJECTIVE: Balance problems are common in older adults with Alzheimer's disease (AD). The objective was to study the effects of a Wii-Fit interactive video-game-led physical exercise program to a walking program on measures of balance in older adults with mild AD.

METHODS: A prospective randomized controlled parallel-group trial (Wii-Fit versus walking) was conducted in thirty community-dwelling older adults (73 ± 6.2 years) with mild AD. Home-based exercises were performed under caregiver supervision for 8 weeks. Primary (Berg Balance Scale, BBS) and secondary outcomes (fear of falls and quality of life) were measured at baseline, 8 weeks (end of intervention), and 16 weeks (8-weeks post-intervention).

RESULTS: At 8 weeks, there was a significantly greater improvement (average intergroup difference [95% CI]) in the Wii-Fit group compared to the walking group in BBS (4.8 [3.3-6.2], $p < 0.001$), after adjusting for baseline. This improvement was sustained at 16 weeks (3.5 [2.0-5.0], $p < 0.001$).

Analyses of the secondary outcome measures indicated that there was a significantly greater improvement in the Wii-Fit group compared to walking group in Activity-specific Balance Confidence scale (6.5 [3.6-9.4], $p < 0.001$) and Falls Efficacy Scale (-4.8 [-7.6 to -2.0], $p = 0.002$) at 8 weeks.

However, this effect was not sustained at 16 weeks. Quality of life improved in both groups at 8 weeks; however, there were no inter-group differences ($p = 0.445$).

CONCLUSION: Home-based, caregiver-supervised Wii-Fit exercises improve balance and may reduce fear of falling in community-dwelling older adults with mild AD.

PDF Y Endnote Y

Hypertension, its treatment, frailty, falls, and mortality

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Hypertension 2017; 70(2): 253-254.

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(Copyright © 2017, American Heart Assn)

DOI 10.1161/HYPERTENSIONAHA.117.09689 **PMID** 28652460

Abstract [Abstract unavailable]

PDF N Endnote Y

Improvement of balance stability in older individuals by on-water training

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J. Aging Phys. Act. 2017; ePub(ePub): e41.

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(Copyright © 2017, Human Kinetics Publishers)

DOI 10.1123/japa.2017-0041 **PMID** 28657810

Abstract

In the present investigation we evaluated the effect of stand-up paddle practice on upright postural control in older individuals. Participants were assigned to a group practicing stand-up paddle on seawater or to a walking control group. Balance stability was evaluated in the tandem Romberg and tiptoes postures, comparing the conditions of eyes open versus closed.

RESULTS showed that stand-up paddle practice led to reduced anteroposterior and mediolateral amplitudes of body sway in both visual conditions, while walking led to no effect on balance. These results suggest that the challenge of keeping body balance on an unstable board during on-water stand-up paddle practice is transferred to postural tasks performed on a stable support surface, with generalization to sensory and biomechanical conditions different from those experienced during the training. Our results suggest that on-water balance training could be considered as a potential procedure to improve balance control in older adults.

PDF Y Endnote Y

Individual housing-based socioeconomic status predicts risk of accidental falls among adults

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(Copyright © 2017, American College of Epidemiology, Publisher Elsevier Publishing)

DOI 10.1016/j.annepidem.2017.05.019 **PMID** 28648550

Abstract

PURPOSE: Accidental falls are a major public health concern among people of all ages. Little is known about whether an individual-level housing-based socioeconomic status measure is associated with the risk of accidental falls.

METHODS: Among 12,286 Mayo Clinic Biobank participants residing in Olmsted County, Minnesota, subjects who experienced accidental falls between the biobank enrollment and September 2014 were identified using ICD-9 codes evaluated at emergency departments. HOUSES (HOUsing-based

Index of SocioEconomic Status), a socioeconomic status measure based on individual housing features, was also calculated. Cox regression models were utilized to assess the association of the HOUSES (in quartiles) with accidental fall risk.

RESULTS: Seven hundred eleven (5.8%) participants had at least one emergency room visit due to an accidental fall during the study period. Subjects with higher HOUSES were less likely to experience falls in a dose-response manner (hazard ratio: 0.58; 95% confidence interval: 0.44-0.76 for comparing the highest to the lowest quartile). In addition, the HOUSES was positively associated with better health behaviors, social support, and functional status.

CONCLUSIONS: The HOUSES is inversely associated with accidental fall risk requiring emergency care in a dose-response manner. The HOUSES may capture falls-related risk factors through housing features and socioeconomic status-related psychosocial factors.

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PDF Y Endnote Y

Influence of single and dual tasks on gait stability and gait speed in the elderly : an explorative study

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(Copyright © 2017, Springer Science+Business Media)

DOI 10.1007/s00391-017-1279-2 **PMID** 28660532

Abstract

BACKGROUND: Gait stability during dual tasks is important for elderly persons, especially for elderly individuals in need of care. A study was conducted to assess gait stability by using Lyapunov exponents (λ_S) during single task and dual task conditions in independently living elderly people (Go-Goes) and elderly people in need of care (No-Goes). **MATERIAL AND METHODS:** This study was conducted with 26 participants (average age 82 ± 9.4 years) who were allocated to the Go-Goes or No-Goes group. Outcomes were mediolateral and vertical Lyapunov exponents (λ_S) from accelerometer data and gait speed under single task and dual task conditions.

RESULTS: In both groups significantly higher mediolateral and vertical Lyapunov exponent values as well as significantly lower walking speeds under dual task conditions were found in both groups. The effect sizes were small to moderate for mediolateral λ_S and large for vertical λ_S and these differences remained when the analyses were adjusted for walking speed.

CONCLUSION: Elderly people showed lower gait stability and gait speed under dual task conditions compared to single task conditions.

PDF Y Endnote Y

Microstructural integrity of white matter tracts amongst older fallers: a DTI study

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DOI 10.1371/journal.pone.0179895 **PMID** 28658309

Abstract

OBJECTIVES: This study assesses the whole brain microstructural integrity of white matter tracts (WMT) among older individuals with a history of falls compared to non-fallers.

METHODS: 85 participants (43 fallers, 42 non-fallers) were evaluated with conventional MRI and diffusion tensor imaging (DTI) sequences of the brain. DTI metrics were obtained from selected WMT using tract-based spatial statistics (TBSS) method. This was followed by binary logistic regression to investigate the clinical variables that could act as confounding elements on the outcomes. The TBSS analysis was then repeated, but this time including all significant predictor variables from the regression analysis as TBSS covariates.

RESULTS: The mean diffusivity (MD) and axial diffusivity (AD) and to a lesser extent radial diffusivity (RD) values of the projection fibers and commissural bundles were significantly different in fallers ($p < 0.05$) compared to non-fallers. However, the final logistic regression model obtained showed that only functional reach, white matter lesion volume, hypertension and orthostatic hypotension demonstrated statistical significant differences between fallers and non-fallers. No significant differences were found in the DTI metrics when taking into account age and the four variables as covariates in the repeated analysis.

CONCLUSION: This DTI study of 85 subjects, do not support DTI metrics as a singular factor that contributes independently to the fall outcomes. Other clinical and imaging factors have to be taken into account.

PDF Y Endnote Y

Out-of-hospital and inter-hospital under-triage to designated tertiary trauma centers among injured older adults: a 10-year statewide geospatial-adjusted analysis

Garwe T, Stewart K, Stoner J, Newgard CD, Scott M, Zhang Y, Cathey T, Sacra J, Albrecht RM. *Prehosp. Emerg. Care* 2017; ePub(ePub): ePub.

(Copyright © 2017, National Association of EMS Physicians, Publisher Informa - Taylor and Francis Group)

DOI 10.1080/10903127.2017.1332123 **PMID** 28661712

Abstract

OBJECTIVE: While out-of-hospital under-triage of seriously injured older adults to tertiary trauma centers has long been acknowledged, no study has adjusted for place of injury or evaluated the extent of inter-facility under-triage. We sought to determine distance and confounder adjusted odds of treatment at a tertiary trauma center (TTC) for older adult trauma patients compared to younger trauma patients, for patients transported from the scene of injury and those transferred from a non-tertiary trauma (NTTC) center.

METHODS: This was a retrospective cohort study utilizing data from a statewide trauma registry reported over a 10-year period (2005-14). The outcome of interest was treatment at an American College of Surgeons or state-designated Level I/II trauma center (TTC). The predictor variable of interest was age group (≥ 55 years vs. < 55 years). Covariates of interest included patient demographics, clinical characteristics and various distance measures calculated based on the patient's injury location.

RESULTS: 84 930 patients met study criteria. Of these 42% (35659) were 55 years and older with an average age of 74 years (SD, 11.6). Older adult patients were on average, injured slightly farther away from a TTC (median distance, 34 vs. 29 miles, $p < 0.001$). Among patients initially presenting to NTTCs, older adults were significantly more likely to be transferred to another NTTC (53% vs. 34%). After adjusting for confounders and distance measures, older adults were less likely to be treated at TTCs overall (OR = 0.54, 95% CI: 0.52-0.56), whether transported by EMS from the scene of injury

(OR = 0.47, 95% CI: 0.44-0.50) or via inter-facility transfer (OR = 0.63, 95%CI: 0.59-0.68).

CONCLUSIONS: Injured older adults face significant under-triage to TTCs whether by EMS from the scene of injury or via transfer from NTTCs. Adjusting for proximity of injury to a TTC does not alter these findings.

PDF Y Endnote Y

Polypharmacy and Gait Performance in Community-dwelling Older Adults

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J. Am. Geriatr. Soc. 2017; ePub(ePub): ePub.

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(Copyright © 2017, John Wiley and Sons)

DOI 10.1111/jgs.14957 **PMID** 28649786

Abstract

OBJECTIVES: To examine the relationship between polypharmacy and gait performance during simple (normal walk (NW)) and complex (walking while talking (WWT)) locomotion.

DESIGN: Cross-sectional.

SETTING: Community.

PARTICIPANTS: Community-dwelling older adults (N = 482).

MEASUREMENTS: Polypharmacy, defined as use of five or more medications and a cohort-specific alternate definition of eight or more medications, was examined. Velocity (cm/s) measured quantitatively during NW and WWT conditions.

RESULTS: The 164 participants (34%) with polypharmacy of five or more medications were older (77.0 ± 6.6 vs 76.0 ± 6.4) and more likely to have hypertension, congestive heart failure, diabetes mellitus, myocardial infarction, and higher body mass index (BMI) and to have fallen within the last year than the remaining 318 without polypharmacy and walked 6 cm/s slower ($P = .004$) during NW and 4 cm/s slower during WWT ($P = .07$), adjusting for age, sex, and education. Group differences were not statistically significant after adjusting for comorbidities. Prevalence of polypharmacy of eight or more medications was 10%. This group walked 11 cm/s slower during NW ($P < .001$) and 8.6 cm/s slower during WWT ($P = .01$) than those without polypharmacy, adjusted for age, sex, and education. Participants taking eight or more medications had slower NW (8.5 cm/s; $P = .01$), and WWT (6.9 cm/s; $P = .07$), compared to those without polypharmacy, adjusting for comorbidities. Adjustments for BMI, high-risk drugs, falls, and comorbidities yielded slower NW (9.4 cm/s, $P = .005$) and WWT (7.9 cm/s, $P = .04$ among those with polypharmacy compared to those without polypharmacy).

CONCLUSION: These results suggest an association between polypharmacy and locomotion that medical comorbidities only partly explained.

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PDF Y Endnote Y

Predicting falls in community dwelling older adults using the Activities-specific Balance

Confidence Scale

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Arch. Gerontol. Geriatr. 2017; 72: 142-145.

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(Copyright © 2017, Elsevier Publishing)

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Abstract

OBJECTIVES: Falls are a significant problem associated with aging, and can lead to serious consequences including injury and death. The purpose of this study was to determine whether balance confidence differed between future fallers and non-fallers, and whether the construct prospectively predicted falls.

METHODS: Forty-five community dwelling older adults aged 65 or older completed the Activities-specific Balance Confidence scale (ABC) and reported falls experienced during the next 6 months.

RESULTS: Eleven (24.4%) subjects were fallers, and had significantly poorer ABC scores ($x=50.6\%$) than their non-faller counterparts ($x=76.3\%$). The regression model was significant, where the ABC score predicted falls at 6 months.

DISCUSSION: Our findings suggest that balance confidence differs between fallers and non-fallers, and that ABC scores can predict future falls in community dwelling older adults.

CONCLUSION: Balance confidence is a fall risk predictor, and thus a critical component of fall risk assessment. Balance confidence should be measured regularly in community dwelling older adults using the ABC.

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PDF Y Endnote Y

Pretrauma functional independence measure score predicts survival in geriatric trauma

Fletcher B, Bradburn E, Baker C, Collier B, Hamill M, Shaver K. *Am. Surg.* 2017; 83(6): 559-563.

(Copyright © 2017, Southeastern Surgical Congress)

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Abstract

The Functional Independence Measure (FIM) is used by rehabilitation professionals to assess disability. The FIM score combines both motor and cognitive parameters to assess a patient's level of required assistance in performing activities of daily living (ADL). The geriatric trauma patient is becoming an increasingly important cohort for trauma services. FIM has been shown to predict discharge outcomes and those at high risk for falls. We hypothesized pretrauma FIM scores may predict survival in the geriatric trauma population. This was a retrospective study of patients 65 years and older that were admitted to our Level I trauma center from July 1, 2006 to July 1, 2012. A total 941 patients underwent stepwise regression to identify those factors predicting survival. Age, Injury Severity Score, revised trauma score, body mass index, and pretrauma FIM scores (12-point scale) were studied. The primary outcome was survival. Statistical significance reached at P value <0.05 . Multiple logistic regression analysis was then performed. A total of 1315 patients were identified and complete data were available on 941 patients. Mean age was 78 (SD ± 8.2), mean Injury Severity Score was 13 (SD ± 8.7), and mean body mass index was 26. Overall mortality was 11 per cent. The odds ratio of survival was 3.532 (95% confidence interval = 2.191-5.718) times greater for every 1-point increase in the preadmission FIM expression score. Glasgow Coma Scale, revised trauma score, gender, and pretrauma FIM expression scores were predictive of survival in the geriatric trauma patient. Pretrauma FIM expression can be used to predict survival in the elderly trauma victim. Further study is needed to establish the role of FIM as part of trauma scoring systems.

PDF N Endnote Y

Reported systems changes and sustainability perceptions of three state departments of health implementing multi-faceted evidence-based fall prevention efforts

Smith ML, Schneider EC, Byers IN, Shubert TE, Wilson AD, Towne SD, Ory MG.

Front. Public Health 2017; 5: e120.

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(Copyright © 2017, Frontiers Editorial Office)

DOI 10.3389/fpubh.2017.00120 **PMID** 28642861 **PMCID** PMC5462909

Abstract

Although the concepts of systems change and sustainability are not new, little is known about the factors associated with systems change sustaining multi-state, multi-level fall prevention efforts. This exploratory study focuses on three State Departments of Health (DOH) that were awarded 5-year funding from the Centers for Disease Control and Prevention to simultaneously implement four separate yet related evidence-based fall prevention initiatives at the clinical, community, and policy level. The purpose of this study was to examine changes in partnerships and collaborative activities that occurred to accomplish project goals (examining changes in the context of "before funding" and "after funding was received"). Additionally, this study explored changes in State DOH perceptions about action related to sustainability indicators in the context of "during funding" and "after funding ends." Findings from this study document the partnership and activity changes necessary to achieve defined fall prevention goals after funding is received, and that the importance of sustainability indicator documentation is seen as relevant during funding, but less so after the funding ends.

FINDINGS from this study have practice and research implications that can inform future funded efforts in terms of sector and stakeholder engagement necessary for initiating, implementing, and sustaining community- and clinical-based fall prevention interventions.

PDF Y Endnote Y

Risk of traumatic intracranial hemorrhage from low-energy falls in the oldest-old patients

Kim SK, Jeong KY, Lee JS, Choi HS, Hong HP, Ko YG.

Ann. Geriatr. Med. Res. 2016; 20(4): 221-228.

(Copyright © 2016, Korean Geriatrics Society)

DOI 10.4235/agmr.2016.20.4.221 **PMID** unavailable

Abstract

BACKGROUND: The population of individuals classified as oldest-old (aged ≥ 85 years) has increased rapidly in recent years. The rates of morbidity from chronic diseases and physical dependence tend to be higher in the oldest-old compared with individuals classified as young-to-middle-old (aged 65-84 years). Therefore, the classification and evaluation of traumatic injuries in the oldest-old group are necessary. Herein we focused on the risk of traumatic intracranial hemorrhage from low-energy falls in older patients

METHODS: Patient medical records from the Emergency Department after low-energy falls that occurred between November 2014 and April 2016 were retrospectively analyzed. Patients were divided into an older group (aged ≥ 65 years) and an adult group (aged 18-64 years); the older group was subdivided into the oldest-old group (aged ≥ 85 years) and a young-to-middle-old group (aged 65-84 years). The rate of intracranial hemorrhage and related factors were also investigated.

RESULTS: The older group had a greater risk of traumatic intracranial hemorrhage than the adult group (20% vs. 12.6%, $p=0.019$). Furthermore, more cases of traumatic intracranial hemorrhage were found in the oldest-old group than in the young-to-middle-old group (37.5% vs. 18.0%, $p=0.024$). Similarly, the risk of traumatic intracranial hemorrhage in the oldest-old was higher than in the young-to-middle-old group ($p=0.032$).

CONCLUSION: The risk of traumatic intracranial hemorrhage from low-energy falls in the oldest-old patients was higher than in the young-to-middle-old patients. Therefore, physicians need to pay particular attention to oldest-old patients, even to those with mental integrity and without neurological deficits.

PDF Y Endnote Y

Self-reported unsteadiness predicts fear of falling, activity restriction, falls, and disability

Donoghue OA, Setti A, O'Leary N, Kenny RA.

J. Am. Med. Dir. Assoc. 2017; 18(7): 597-602.

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(Copyright © 2017, Lippincott Williams and Wilkins)

DOI 10.1016/j.jamda.2017.01.022 **PMID** 28648902

Abstract

OBJECTIVE: To determine if self-reported unsteadiness during walking is associated with fear of falling (FOF), fear-related activity restriction, falls, and disability over 2 years in community-dwelling adults.

DESIGN: Data were obtained from the first 2 waves of The Irish Longitudinal Study on Ageing, a population-based study.

SETTING: Participants completed a home-based interview and a center-based health assessment at baseline and a home-based interview at 2 years follow-up.

PARTICIPANTS: Community-dwelling adults aged ≥ 65 years, with Mini-Mental State Examination score ≥ 18 at baseline, and fully observed variables were included in the analyses ($N = 1621$).

MEASUREMENTS: Outcome variables were FOF, fear-related activity restriction, recurrent falls, and disability.

RESULTS: Unsteadiness was independently associated with an increased risk of all outcomes at follow-up after adjusting for sociodemographic variables, and physical, mental, and cognitive health (Incidence Rate Ratio [IRR] range 1.49-2.29; $P < .05$). All associations were attenuated after adjusting for usual gait speed but remained consistent in direction. The association was strongest for fear-related activity restriction [IRR = 1.82 (1.21-2.73); $P < .01$]. There was also evidence of an association between unsteadiness and an increased risk of activity restriction in adults who did not report FOF at baseline [IRR = 1.99 (1.10-3.61); $P < .05$].

CONCLUSIONS: Self-reported unsteadiness is independently associated with an increased risk of FOF, fear-related activity restriction, recurrent falls, and disability at follow-up. Self-reported balance/steadiness should be included in routine assessment of older adults especially those at risk of falls. As unsteadiness is modifiable, older adults should be targeted for balance-related training or medication review to minimize future risk of these outcomes.

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PDF Y Endnote Y

The effect of traumatic brain injury history with loss of consciousness on rate of cognitive decline among older adults with normal cognition and Alzheimer's disease dementia

Tripodis Y, Alosco ML, Ziropiannis N, Gavett BE, Chaisson C, Martin B, McClean MD, Mez J, Kowall N, Stern RA.

J. Alzheimers Dis. 2017; 59(1): 251-263.

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(Copyright © 2017, IOS Press)

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Abstract

Traumatic brain injury (TBI) is thought to be a risk factor for dementia, including dementia due to Alzheimer's disease (AD). However, the influence of TBI history on the neuropsychological course of AD is unknown and, more broadly, the effect of TBI history on age-related cognitive change is poorly understood. We examined the relationship between history of TBI with loss of consciousness (LOC) history and cognitive change in participants with normal cognition and probable AD, stratified by APOEε4 allele status. The sample included 706 participants (432 with normal cognition; 274 probable AD) from the National Alzheimer's Coordinating Center (NACC) dataset that completed the Uniform Data Set evaluation between 2005 and 2014. Normal and probable AD participants with a history of TBI were matched to an equal number of demographically and clinically similar participants without a TBI history. In this dataset, TBI with LOC was defined as brain trauma with brief or extended unconsciousness. For the normal and probable AD cohorts, there was an average of 3.2±1.9 and 1.8±1.1 years of follow-up, respectively. 30.8% of the normal cohort were APOEε4 carriers, whereas 70.8% of probable AD participants were carriers. Mixed effects regressions showed TBI with LOC history did not affect rates of cognitive change in APOEε4 carriers and non-carriers.

FINDINGS from this study suggest that TBI with LOC may not alter the course of cognitive function in older adults with and without probable AD. Future studies that better characterize TBI (e.g., severity, number of TBIs, history of subconcussive exposure) are needed to clarify the association between TBI and long-term neurocognitive outcomes.

PDF Y Endnote Y

Are static and functional balance abilities related in individuals with Multiple Sclerosis?

Pau M, Porta M, Coghe G, Corona F, Pilloni G, Loreface L, Marrosu MG, Cocco E.

Mult. Scler. Relat. Disord. 2017; 15: 1-6.

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(Copyright © 2017, Elsevier Publishers)

DOI 10.1016/j.msard.2017.04.002 **PMID** 28641764

Abstract

BACKGROUND: In people with Multiple Sclerosis (pwMS), balance assessment is essential in estimating the risk of falls, monitoring disease progression and verifying the effectiveness of rehabilitative treatment. Clinical tools and instrumental techniques are available for testing static and dynamic balance, but the relationship between such abilities is still not clear. Having information about this link would be important in properly planning the type and number of tests to administer. **METHODS:** One hundred and six pwMS (Expanded Disability Status Scale, EDSS 0-6.5) stratified in three sub-groups (Class 1 EDSS 0-1.5, Class 2 EDSS 2-4 and Class 3 EDSS 4.5-6.5) and 42 healthy

controls (HC) participated in the study. All underwent static posturography and instrumented Timed-Up-and-Go (TUG) performed using a wearable inertial sensor. Raw data were processed to extract postural sway features, overall duration of TUG and its main sub-phases (i.e. sit-to-stand, 180° turns and stand-to-sit).

RESULTS: All sway parameters of pwMS of Classes 2 and 3, as well as total TUG duration and time necessary to perform 180° turns, were found significantly higher than HC and Class 1 participants. However, poor correlations were found between sway and TUG parameters. When pwMS are grouped, small/moderate correlations (in the range 0.20-0.41) were found between all sway parameters and total TUG duration.

CONCLUSIONS: Static and dynamic balance in pwMS appear scarcely correlated, although both worsen as disability increases. This implies that they should be separately assessed using specific tests to have a complete view of postural control performance in MS.

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