

SafetyLit October 22, 2017**A greater extent of insomnia symptoms and physician-recommended sleep medication use predict fall risk in community-dwelling older adults**

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DOI 10.1093/sleep/zsx142 **PMID** 29029240

Abstract

STUDY OBJECTIVES: Cross-sectional studies suggest that insomnia symptoms are associated with falls in later life. This longitudinal study examines the independent and interactive effects of the extent of insomnia symptoms (i.e., multiple co-existing insomnia symptoms) and sleep medications on fall risk over a 2-year follow-up among community-dwelling older adults.

METHODS: Using data from the Health and Retirement Study (2006-2014, N = 6882, Mage = 74.5 years ± 6.6 years), we calculated the extent of insomnia symptoms (range = 0-4) participants reported (i.e., trouble falling asleep, waking up during the night, waking up too early, and not feeling rested). At each wave, participants reported recent sleep medications use and falls since the last wave, and were evaluated for balance and walking speed.

RESULTS: A greater burden of insomnia symptoms and using physician-recommended sleep medications at baseline independently predicted falling after adjusting for known risk factors of falling. The effects of insomnia symptoms on fall risk differed by sleep medications use. The extent of insomnia symptoms exhibited a positive, dose-response relation with risk of falling among those not using sleep medications. Older adults using physician-recommended sleep medications exhibited a consistently higher fall risk irrespective of the extent of insomnia symptoms.

CONCLUSIONS: The number of insomnia symptoms predicts 2-year fall risk in older adults. Taking physician-recommended sleep medications increases the risks for falling in older adults, irrespective of the presence of insomnia symptoms. Future efforts should be directed toward treating insomnia symptoms, and managing and selecting sleep medications effectively to decrease the risk of falling in older adults.

PDF Not yet available Endnote Y

Association between sleep duration and injury from falling among older adults: a cross-sectional analysis of Korean Community Health Survey data

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Yonsei Med. J. 2017; 58(6): 1222-1228.

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Abstract

PURPOSE: While sleeping problems increase with advancing age, there are inherent differences in sleep between males and females. Previous studies have shown inconsistent results of the

relationship between sleep duration and risk of injury from falling. While controlling various sociodemographic and health-related factors, national representative data were used in order to analyze the association between sleep duration and injury from falling among older adults.

MATERIALS AND METHODS: The data were obtained from the Korean Community Health Survey of 2011. A total of 55654 individuals aged 65 years and older participated in the study. Multivariable logistic regression analysis was conducted to identify the factors associated with injury from falling. **RESULTS:** After adjusting for covariates, such as age, sex, marital status, whether or not an individual is a recipient of benefits from the National Basic Livelihood Act, hypertension, diabetes mellitus, dyslipidemia, stress level, and self-rated health status, those who slept five hours or less per day [odds ratio (OR)=1.26; 95% confidence interval (CI)=1.18-1.34; $p<0.001$] or eight hours or more per day (OR=1.11; 95% CI=1.04-1.17; $p=0.001$) presented significantly higher ORs for injury from falling. A similar result was found when we conducted stratification by sex.

CONCLUSION: The current study supports that there is a relationship between short sleep duration and injury from falling and also identified a marginal risk of long sleep in older adults. Therefore, sleep management in older adults with inadequate sleep duration may be necessary.

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Balance problems and fall risks in the elderly

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Phys. Med. Rehabil. Clin. N. Am. 2017; 28(4): 727-737.

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Abstract

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

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Configurable, wearable sensing and vibrotactile feedback system for real-time postural balance and gait training: proof-of-concept

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J. Neuroengineering Rehabil. 2017; 14(1): e102.

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Abstract

BACKGROUND: Postural balance and gait training is important for treating persons with functional impairments, however current systems are generally not portable and are unable to train different types of movements.

METHODS: This paper describes a proof-of-concept design of a configurable, wearable sensing and feedback system for real-time postural balance and gait training targeted for home-based treatments and other portable usage. Sensing and vibrotactile feedback are performed via eight distributed, wireless nodes or "Dots" (size: 22.5 × 20.5 × 15.0 mm, weight: 12.0 g) that can each be configured for sensing and/or feedback according to movement training requirements. In the first experiment, four healthy older adults were trained to reduce medial-lateral (M/L) trunk tilt while performing balance exercises. When trunk tilt deviated too far from vertical (estimated via a sensing Dot on the lower spine), vibrotactile feedback (via feedback Dots placed on the left and right sides of the lower torso) cued participants to move away from the vibration and back toward the vertical no feedback zone to correct their posture. A second experiment was conducted with the same wearable system to train six healthy older adults to alter their foot progression angle in real-time by internally or externally rotating their feet while walking. Foot progression angle was estimated via a sensing Dot adhered to the dorsal side of the foot, and vibrotactile feedback was provided via feedback Dots placed on the medial and lateral sides of the mid-shank cued participants to internally or externally rotate their foot away from vibration.

RESULTS: In the first experiment, the wearable system enabled participants to significantly reduce trunk tilt and increase the amount of time inside the no feedback zone. In the second experiment, all participants were able to adopt new gait patterns of internal and external foot rotation within two minutes of real-time training with the wearable system.

CONCLUSION: These results suggest that the configurable, wearable sensing and feedback system is portable and effective for different types of real-time human movement training and thus may be suitable for home-based or clinic-based rehabilitation applications.

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Development of an evidence-based complex intervention for community rehabilitation of patients with hip fracture using realist review, survey and focus groups

Roberts JL, Din NU, Williams M, Hawkes CA, Charles JM, Hoare Z, Morrison V, Alexander S, Lemmey A, Sackley C, Logan P, Wilkinson C, Rycroft-Malone J, Williams NH.

BMJ Open 2017; 7(10): e014362.

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(Copyright © 2017, BMJ Publishing Group)

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Abstract

OBJECTIVES: To develop an evidence and theory-based complex intervention for improving outcomes in elderly patients following hip fracture.

DESIGN: Complex-intervention development (Medical Research Council (MRC) framework phase I) using realist literature review, surveys and focus groups of patients and rehabilitation teams.

SETTING: North Wales. **PARTICIPANTS:** Surveys of therapy managers (n=13), community and hospital-based physiotherapists (n=129) and occupational therapists (n=68) throughout the UK.

Focus groups with patients (n=13), their carers (n=4) and members of the multidisciplinary rehabilitation teams in North Wales (n=13).

RESULTS: The realist review provided understanding of how rehabilitation interventions work in the real-world context and three programme theories were developed: improving patient engagement by tailoring the intervention to individual needs; reducing fear of falling and improving self-efficacy to exercise and perform activities of daily living; and coordination of rehabilitation delivery. The survey provided context about usual rehabilitation practice; focus groups provided data on the experience, acceptability and feasibility of rehabilitation interventions. An intervention to enhance usual rehabilitation was developed to target these theory areas comprising: a physical component consisting of six additional therapy sessions; and a psychological component consisting of a workbook to enhance self-efficacy and a patient-held goal-setting diary for self-monitoring.

CONCLUSIONS: A realist approach may have advantages in the development of evidence-based interventions and can be used in conjunction with other established methods to contribute to the development of potentially more effective interventions. A rehabilitation intervention was developed which can be tested in a future randomised controlled trial (MRC framework phases II and III). **TRIAL REGISTRATION NUMBER:** ISRCTN22464643, Pre-results.

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PDF Endnote

Effectiveness of a multifaceted delirium screening, prevention, and treatment initiative on the rate of delirium falls in the acute care setting

Ferguson A, Uldall K, Dunn J, Blackmore CC, Williams B.

J. Nurs. Care Qual. 2017; ePub(ePub): ePub.

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Abstract

Delirium is a potentially modifiable fall risk factor, but few studies address the effects of delirium programs on falls. Beginning in 2011, we implemented a nursing-driven hospitalwide delirium program targeting improvements in risk identification, prevention, detection, and treatment. Over the course of the program, delirium falls decreased from 0.91 to 0.50 per patient day ($P = .0002$). A decrease in overall falls was also noted ($P = .0007$).

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Fall detection in individuals with lower limb amputations using mobile phones: machine learning enhances robustness for real-world applications

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JMIR Mhealth Uhealth 2017; 5(10): e151.

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Abstract

BACKGROUND: Automatically detecting falls with mobile phones provides an opportunity for rapid response to injuries and better knowledge of what precipitated the fall and its consequences. This is beneficial for populations that are prone to falling, such as people with lower limb amputations. Prior studies have focused on fall detection in able-bodied individuals using data from a laboratory setting. Such approaches may provide a limited ability to detect falls in amputees and in real-world scenarios.

OBJECTIVE: The aim was to develop a classifier that uses data from able-bodied individuals to detect falls in individuals with a lower limb amputation, while they freely carry the mobile phone in different locations and during free-living.

METHODS: We obtained 861 simulated indoor and outdoor falls from 10 young control (non-amputee) individuals and 6 individuals with a lower limb amputation. In addition, we recorded a broad database of activities of daily living, including data from three participants' free-living routines. Sensor readings (accelerometer and gyroscope) from a mobile phone were recorded as participants freely carried it in three common locations-on the waist, in a pocket, and in the hand. A set of 40 features were computed from the sensors data and four classifiers were trained and combined through stacking to detect falls. We compared the performance of two population-specific models, trained and tested on either able-bodied or amputee participants, with that of a model trained on able-bodied participants and tested on amputees. A simple threshold-based classifier was used to benchmark our machine-learning classifier.

RESULTS: The accuracy of fall detection in amputees for a model trained on control individuals (sensitivity: mean 0.989, 1.96*standard error of the mean [SEM] 0.017; specificity: mean 0.968, SEM 0.025) was not statistically different ($P=.69$) from that of a model trained on the amputee population (sensitivity: mean 0.984, SEM 0.016; specificity: mean 0.965, SEM 0.022). Detection of falls in control individuals yielded similar results (sensitivity: mean 0.979, SEM 0.022; specificity: mean 0.991, SEM 0.012). A mean 2.2 (SD 1.7) false alarms per day were obtained when evaluating the model (vs mean 122.1, SD 166.1 based on thresholds) on data recorded as participants carried the phone during their daily routine for two or more days. Machine-learning classifiers outperformed the threshold-based one ($P<.001$).

CONCLUSIONS: A mobile phone-based fall detection model can use data from non-amputee individuals to detect falls in individuals walking with a prosthesis. We successfully detected falls when the mobile phone was carried across multiple locations and without a predetermined orientation. Furthermore, the number of false alarms yielded by the model over a longer period of time was reasonably low. This moves the application of mobile phone-based fall detection systems closer to a real-world use case scenario.

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Is routine head CT indicated in awake stable older patients after a ground level fall?

Sartin R, Kim C, Dissanaik S.

Am. J. Surg. 2017; ePub(ePub): ePub.

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Abstract [Abstract unavailable] Q and A session

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Kyphosis and incident falls among community-dwelling older adults

McDaniels-Davidson C, Davis A, Wing D, Macera C, Lindsay SP, Schousboe JT, Nichols JF, Kado DM. *Osteoporos. Int.* 2017; ePub(ePub): ePub.

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DOI 10.1007/s00198-017-4253-3 **PMID** 29018904

Abstract

Hyperkyphosis commonly affects older persons and is associated with morbidity and mortality. Many have hypothesized that hyperkyphosis increases fall risk. Within this prospective study of older adults, kyphosis was significantly associated with incident falls over 1 year. Measures of hyperkyphosis could enhance falls risk assessments during primary care office visits.

INTRODUCTION: To determine the association between four measures of kyphosis and incident and injurious falls in older persons.

METHODS: Community-dwelling adults aged 65 and older (n = 72) residing in southern California were invited to participate in a prospective cohort study. Participants had kyphosis assessed four ways. Two standing measures included a flexicurve ruler placed against the back to derive a kyphotic index and the Debrunner kyphometer, a protractor used to measure the kyphotic angle in degrees. Two lying measures included the blocks method (number of 1.7 cm blocks needed to achieve a neutral head position while lying supine) and traditional Cobb angle calculation derived from DXA based lateral vertebral assessment. Baseline demographic, clinical, and other health information (including a timed up and go (TUG) test) were assessed at a clinic visit. Participants were followed monthly through email or postcard for 1 year, with falls outcomes confirmed through telephone interview.

RESULTS: Mean age was 77.8 (\pm 7.1) among the 52 women and 20 men. Over 12 months, 64% of participants experienced at least one incident fall and 35% experienced an injurious fall. Each standard deviation increase in kyphosis resulted in more than doubling the adjusted odds of an incident fall, even after adjusting for TUG. Odds of injurious falls were less consistent across measures; after adjusting for TUG, only the blocks method was associated with injurious falls.

CONCLUSIONS: Each kyphosis measure was independently associated with incident falls.

FINDINGS were inconsistent for injurious falls; the blocks measure suggested the strongest association. If these findings are replicated, the blocks measure could be incorporated into office visits as a quick and efficient tool to identify patients at increased fall risk.

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Multiple self-reported sleep measures are differentially associated with cognitive performance in community-dwelling nondemented elderly

Bernstein JPK, Calamia M, Keller JN.

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Abstract

OBJECTIVE: To examine associations between daytime and insomnia-related sleep problems with different domains of cognitive functioning and determine whether subclinical depressive symptoms and age moderate these associations.

METHOD: A total of 903 cognitively healthy older adults enrolled in a longitudinal aging study completed the UDS neuropsychological battery (measuring attention, executive functioning, episodic memory, language and processing speed). Subclinical depressive symptoms were also assessed and self-reported measures of sleep were administered.

RESULTS: Hierarchical multiple regression analyses separately assessing the effects of daytime and insomnia-related sleep problems on cognition identified relationships between both daytime and insomnia-related sleep problems with a composite measure of executive functioning; however, the former was related more to speed of processing and the latter to higher order executive abilities. Age moderated the relationship between insomnia severity and executive functioning, and subclinical depressive symptoms moderated the relationship between insomnia-related sleep problems and performance on measures of attention.

CONCLUSIONS: Among older adults, sleep problems have a deleterious effect on executive functioning regardless of whether they occur during the day or nighttime; however, age and subclinical depressive symptoms differentially impact relationships between sleep variables and cognitive domains. (PsycINFO Database Record

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Normal changes in gait and mobility problems in the elderly

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Phys. Med. Rehabil. Clin. N. Am. 2017; 28(4): 713-725.

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Abstract

There are normal physiologic changes that occur as people age. Gait and mobility are altered with aging, and these changes are a combination of alterations in the gait pattern and in the function of organs. Changes in gait are associated with functional decline, less independence, and impaired quality of life. Reduced walking speed is the most consistent age-related change, but there are other contributors to an altered gait: impaired balance and stability, lower extremity strength, and the fear of falling.

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Rehabilitation needs of the elder with traumatic brain injury

Mas MF, Mathews A, Gilbert-Baffoe E.

Phys. Med. Rehabil. Clin. N. Am. 2017; 28(4): 829-842.

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Abstract

The incidence of traumatic brain injury (TBI) in older adults is increasing. As the expected life expectancy increases, there is a heightened need for comprehensive rehabilitation for this population. Elderly patients with TBI benefit from rehabilitation interventions at all stages of injury and can achieve functional gains during acute inpatient rehabilitation. Clinicians should be vigilant of unique characteristics of this population during inpatient rehabilitation, including vulnerability to polypharmacy, posttraumatic hydrocephalus, neuropsychiatric sequelae, sleep disturbances, and sensory deficits. Long-term care should include fall prevention, assessment of cognitive deficits, aerobic activity, community reintegration, and caretaker support. Life expectancy is reduced after TBI.

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Falls and disability among female cancer survivors

Pullen LC.

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Abstract [Abstract unavailable]

PDF Y Endnote Y

Hip fracture presentations are less frequent at weekends

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Abstract [Abstract unavailable]

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Polypharmacy and risk of falls and fractures for patients with HIV infection and substance dependence

Kim TW, Walley AY, Ventura AS, Patts GJ, Heeren TC, Lerner GB, Mauricio N, Saitz R.

AIDS Care 2017; ePub(ePub): ePub.

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Abstract

Although people with HIV infection (PLWH) are at higher risk of polypharmacy and substance use, there is limited knowledge about potential harms associated with polypharmacy such as falls and fractures in this population. The study objective was to determine whether polypharmacy, as measured by the number and type of medication, is associated with falls and fractures among PLWH and DSM-IV substance dependence in the past year or ever injection drug use (IDU). We identified the number of medications by electronic medical record review in the following categories: (i)

systemically active, (ii) non-antiretroviral (non-ARV), (iii) sedating, (iv) non-sedating as well as any opioid medication and any non-opioid sedating medication. Outcomes were self-reported (1) fall/accident requiring medical attention and (2) fracture in the previous year. Separate logistic regression models were fitted for medications in each category and each outcome. Among 250 participants, the odds of a fall requiring medical attention were higher with each additional medication overall (odds ratio [OR] 1.12, 95% Confidence Interval [CI] = 1.05, 1.18), each additional non-ARV medication (OR 1.13, 95%CI = 1.06, 1.20), each additional sedating medication (OR 1.36, 95%CI = 1.14, 1.62), and a non-opioid sedating medication (OR 2.89, 95%CI = 1.06, 7.85) but not with an additional non-sedating medication or opioid medication. In receiver operating characteristic (ROC) curve analyses, optimal cutoffs for predicting falls were: ≥ 8 overall and ≥ 2 sedating medications. Odds ratios for fracture in the previous year were OR 1.05, 95%CI = 0.97, 1.13 for each additional medication overall and OR 1.11, 95%CI = 0.89, 1.38 for each additional sedating medication. In PLWH and substance dependence or ever IDU, a higher number of medications was associated with greater odds of having a fall requiring medical attention. The association appeared to be driven largely by sedating medications. Future studies should determine if reducing such polypharmacy, particularly sedating medications, lowers the risk of falls.

PDF Y Endnote Y

Citation Trauma mechanism predicts the frequency and the severity of injuries in blunt trauma patients

Parreira JG, Rondini GZ, Below C, Tanaka GO, Pelluchi JN, Arantes-Perlingeiro J, Soldá SC, Assef JC. *Rev. Col. Bras. Cir.* 2017; 44(4): 340-347.

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DOI 10.1590/0100-69912017004007 **PMID** 29019536

Abstract

OBJECTIVE: to study the correlation of trauma mechanism with frequency and severity of injuries in blunt trauma patients.

METHODS: retrospective analysis of trauma registry in a 15-month period was carried out. Trauma mechanism was classified into six types: occupants of four-wheeled vehicles involved in road traffic accidents (AUTO), pedestrians struck by road vehicles (PED), motorcyclists involved in road traffic accidents (MOTO), falls from height (FALL), physical assault with blunt instruments (ASSA) and falls on same level (FSL). Injuries with AIS>2 were considered severe. One-way ANOVA, Students t and Chi-square tests were used for statistical analysis, considering $p < 0.05$ significant.

RESULTS: trauma mechanism was classified by group for 3639 cases, comprising 337 (9.3%) AUTO, 855 (23.5%) PED, 924 (25.4%) MOTO, 455 (12.5%) FALL, 424 (11.7%) ASSA and 644 (17.7%) FSL. There was significant difference among groups when comparing the Revised Trauma Score (RTS), the Injury Severity Score (ISS) and the Abbreviated Injury Scale (AIS) of the head, thorax, abdomen and extremities ($p < 0.001$). Severe injuries in the head and in the extremities were more frequent in PED patients ($p < 0.001$). Severe injuries to the chest were more frequent in AUTO ($p < 0.001$). Abdominal injuries were less frequent in FSL ($p = 0.004$). Complex fractures of the pelvis and spine were more frequent in FALL ($p < 0.001$). Lethality was greater in PED, followed by FALL and AUTO ($p < 0.001$).

CONCLUSION: trauma mechanism analysis predicted frequency and severity of injuries in blunt trauma patients.

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