Balance disorders in the elderly: does instability increase over time?

Soto-Varela A, Rossi-Izquierdo M, Faraldo-García A, Vaamonde-Sánchez-Andrade I, Gayoso-Diz P, Del-Río-Valeiras M, Lirola-Delgado A, Santos-Pérez S.

Affiliation: Division of Neurotology, Department of Otorhinolaryngology, Complexo Hospitalario Universitario, Santiago de Compostela, Spain Department of Dermatology and Otorhinolaryngology, University of Santiago de Compostela, Spain.

Abstract

OBJECTIVES: To analyze the equilibriometric differences between 2 populations of elderly patients (young elderly and very elderly) with instability induced solely by age.
METHODS: Cross-sectional study, with 2 study groups classified according to patient age (cut-points in twenty-fifth and seventy-fifth percentiles of the age of the sample). POPULATION: 64 patients aged 65 years or more. Two groups of 32 subjects were established: group A (people 65 years of age or older but less than 72.6, twenty-fifth percentile) and group B (patients 82.5 years, seventh-fifth percentile, or older). Main analyzed variables: timed up-and-go test, sensory organization test of the computerized dynamic posturography, Dizziness Handicap Inventory (DHI), and Short Falls Efficacy Scale-International (FES-I) questionnaires. Student's t test or the Mann-Whitney test were used.
RESULTS: The older patients obtain poorer scores in the equilibriometric tests but not in all of them. In the sensory organization test, the older patients make poorer use of visual and vestibular information; they also require more time and steps for the timed up-and-go. With regards to the questionnaires, fear of falling is greater (higher Short FES-I scores) but not subjective perception of disability (DHI scores without differences).
CONCLUSIONS: There is a need to establish aged subgroups of elderly patients with instability, adapting therapeutic strategies.

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Effect of structured physical activity on prevention of serious fall injuries in adults aged 70-89: randomized clinical trial (LIFE Study)

Gill TM, Pahor M, Guralnik JM, McDermott MM, King AC, Buford TW, Strotmeyer ES, Nelson ME, Sink KM, Demons JL, Kashaf SS, Walkup MP, Miller ME.

Affiliation: Department of Biostatistical Sciences, Wake Forest School of Medicine, Winston-Salem, NC, USA.

Abstract

OBJECTIVE: To test whether a long term, structured physical activity program compared with a health education program reduces the risk of serious fall injuries among sedentary older people with functional limitations.
DESIGN: Multicenter, single blinded randomized trial (Lifestyle Interventions and Independence for Elders (LIFE) study). SETTING: Eight centers across the United States, February 2010 to December 2011. PARTICIPANTS: 1635 sedentary adults aged 70-89 years with functional limitations, defined as

a short physical performance battery score ≤9, but who were able to walk 400 m.

INTERVENTIONS: A permuted block algorithm stratified by field center and sex was used to allocate interventions. Participants were randomized to a structured, moderate intensity physical activity program (n=818) conducted in a center (twice a week) and at home (3-4 times a week) that included aerobic, strength, flexibility, and balance training activities, or to a health education program (n=817) consisting of workshops on topics relevant to older people and upper extremity stretching exercises.

MAIN OUTCOME MEASURES: Serious fall injuries, defined as a fall that resulted in a clinical, non-vertebral fracture or that led to a hospital admission for another serious injury, was a prespecified secondary outcome in the LIFE Study. Outcomes were assessed every six months for up to 42 months by staff masked to intervention assignment. All participants were included in the analysis.

RESULTS: Over a median follow-up of 2.6 years, a serious fall injury was experienced by 75 (9.2%) participants in the physical activity group and 84 (10.3%) in the health education group (hazard ratio 0.90, 95% confidence interval 0.66 to 1.23; P=0.52). These results were consistent across several subgroups, including sex. However, in analyses that were not prespecified, sex specific differences were observed for rates of all serious fall injuries (rate ratio 0.54, 95% confidence interval 0.31 to 0.95 in men; 1.07, 0.75 to 1.53 in women; P=0.043 for interaction), fall related fractures (0.47, 0.25 to 0.86 in men; 1.12, 0.77 to 1.64 in women; P=0.017 for interaction), and fall related hospital admissions (0.41, 0.19 to 0.89 in men; 1.10, 0.65 to 1.88 in women; P=0.039 for interaction).

CONCLUSIONS: In this trial, which was underpowered to detect small, but possibly important reductions in serious fall injuries, a structured physical activity program compared with a health education program did not reduce the risk of serious fall injuries among sedentary older people with functional limitations. These null results were accompanied by suggestive evidence that the physical activity program may reduce the rate of fall related fractures and hospital admissions in men.Trial registration ClinicalsTrials.gov NCT01072500.

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Effects of exergames on balance, functional mobility, and quality of life of geriatrics versus home exercise programme: randomized controlled study

Karahan AY, Tok F, Taşkın H, Kuçuksaraç S, Başaran A, Yıldırım P.

Affiliation: Department of Physical Medicine and Rehabilitation, Derince Education and Training Hospital, Kocaelei, Turkey.

Abstract

AIM: To compare the effects of exergames (EGs) using the Xbox Kinect™ device and home exercise (HE) on balance, functional mobility, and quality of life of individuals aged 65 years or older.

METHOD: One hundred participants who met the inclusion criteria were randomized to the EG or HE group. The EG group took part in a 6-week programme using the Xbox360Kinect™ device, and the HE group took part in a 6-week balance exercise programme at home 5 days a week. The Berg Balance Scale (BBS) was used to assess balance, the Timed Up and Go (TUG) test was used to evaluate functional walking, and the Short Form 36 (SF-36) was used to assess quality of life.

RESULTS: Forty-eight participants in the EG group and 42 participants in the HE group completed the study. The groups were similar in terms of age, sex, and pretreatment values of BBS, TUG, and SF-36.

Although the BBS scores of both groups improved significantly (all p<0.05), the post-treatment scores of the EG group were better than those of the HE group. The TUG scores improved only in the EG group (p<0.05). The increase in the BBS scores and decrease in the TUG test scores were significant only in the EG group (all p<0.05). A significant improvement was also observed in the quality of life parameters of physical functioning, social role functioning, physical role restriction, general health perceptions, and physical component scores in the post-exercise evaluations of the EG group. The participants commented that they found the EG programme very entertaining. CONCLUSION: The EG can be considered a safe, entertaining and sustainable alternative to HE programmes, and it may have positive effects on balance, functional walking and quality of life in geriatric subjects.

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Exercise and fall prevention self-management to reduce mobility-related disability and falls after fall-related lower limb fracture in older people: protocol for the RESTORE (Recovery Exercises and STepping On afteR fracturE) randomised controlled trial

Sherrington C, Fairhall N, Kirkham C, Clemson L, Howard K, Vogler C, Close JC, Moseley AM, Cameron ID, Mak J, Sonnabend D, Lord SR.

Affiliation: Neuroscience Research Australia, University of New South Wales, Sydney, Australia. s.lord@neura.edu.au.

Abstract

BACKGROUND: Lasting disability and further falls are common and costly problems in older people following fall-related lower limb and pelvic fractures. Exercise interventions can improve mobility after fracture and reduce falls in older people, however the optimal approach to rehabilitation after fall-related lower limb and pelvic fracture is unclear. This randomised controlled trial aims to evaluate the effects of an exercise and fall prevention self-management intervention on mobility-related disability and falls in older people following fall-related lower limb or pelvic fracture. Cost-effectiveness of the intervention will also be investigated.

METHODS/DESIGN: A randomised controlled trial with concealed allocation, assessor blinding for physical performance tests and intention-to-treat analysis will be conducted. Three hundred and fifty people aged 60 years and over with a fall-related lower limb or pelvic fracture, who are living at home or in a low care residential aged care facility and have completed active rehabilitation, will be recruited. Participants will be randomised to receive a 12-month intervention or usual care. The intervention group will receive ten home visits from a physiotherapist to prescribe an individualised exercise program with motivational interviewing, plus fall prevention education through individualised advice from the physiotherapist or attendance at the group based "Stepping On" program (seven two-hour group sessions). Participants will be followed for a 12-month period. Primary outcome measures will be mobility-related disability and falls. Secondary outcomes will include measures of balance and mobility, falls risk, physical activity, walking aid use, frailty, pain, nutrition, falls efficacy, mood, positive and negative affect, quality of life, assistance required, hospital readmission, and health-system and community-service contact.

DISCUSSION: This study will determine the effect and cost-effectiveness of this exercise self management intervention on mobility-related disability and falls in older people who have recently

sustained a fall-related lower limb or pelvic fracture. The results will have implications for the design and implementation of interventions for older people with fall related lower limb fractures. The findings of this study will be disseminated in peer-reviewed journals and through professional and scientific conferences. TRIAL REGISTRATION: Australian New Zealand Clinical Trials Registry: ACTRN12610000805077.

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Fall prevention in postmenopausal women: the role of Pilates exercise training

Hita-Contreras F, Martínez-Amat A, Cruz-Díaz D, Pérez-López FR.
Climacteric 2016; ePub(ePub): ePub.
Affiliation: University of Zaragoza , Faculty of Medicine and Lozano Blesa University Hospital , Zaragoza , Spain.
Abstract
Falls and fall-related injuries are a major public health concern for postmenopausal women. Fear of falling, impairments in gait and postural control, and changes in body composition have been identified as important risk factors for falling. Physical exercise is an important tool in fall prevention and management. The Pilates method is a non-impact activity that can be adapted to different physical conditions and health status and is recommended for various populations. In postmenopausal women, it has been deemed an effective way to improve some fall-related physical and psychological aspects, such as postural and dynamic balance. In addition, some physical capacities, such as flexibility, personal autonomy, mobility, and functional ability have also shown to benefit from Pilates interventions involving women in their second half of life, as well as certain psychological aspects including fear of falling, depressive status, and quality of life. Pilates exercise has shown effectively to prevent falls in postmenopausal women by improving their balance, physical and psychological functioning, and independence. Nevertheless, further studies are needed to demonstrate its validity in different clinical situations.

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Fall prevention in the young old using an exoskeleton human body posturizer: a randomized controlled trial

Verrusio W, Gianturco V, Cacciafesta M, Marigliano V, Troisi G, Ripani M.
Aging Clin. Exp. Res. 2016; ePub(ePub): ePub.
Affiliation: Department of Human Movement, Social and Health Sciences, University of Rome "Foro Italico", Rome, Italy.
Abstract
BACKGROUND: Fall risk in elderly has been related with physical decline, low quality of life and reduced survival.
AIM: To evaluate the impact of exoskeleton human body posturizer (HBP) on the fall risk in the elderly.
METHODS: 150 subjects (mean age 64.85; 79 M/71 F) with mild fall risk were randomized into two groups: 75 for group treated with human body posturizer (HBP group) and 75 for physical training

without HBP group (exercise group). The effects of interventions were assessed by differences in tests related to balance and falls. Medically eligible patients were screened with Tinetti balance and Gait evaluation scale, short physical performance battery and numeric pain rating scale to determine fall risk in elderly people.

RESULTS: In the HBP group there was a significant improvement in short physical performance battery, Tinetti scale and Pain Numeric rating scale with a significant reduction in fall risk (p < 0.05). In the exercise group we observed only minimal variations in the test scores.

DISCUSSION: The results at the sixth and twelfth months show a twofold positive effect in the HBP group reducing fall risk and improving quality of life by reducing pain.

CONCLUSION: The use of exoskeleton human body posturizer seems to be a new significant device for prevention of fall in elderly patients. Further research should be carried out to obtain more evidence on effects of robotic technology for fall prevention in the elderly.

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Foot and ankle characteristics associated with falls in adults with established rheumatoid arthritis: a cross-sectional study

Brenton-Rule A, Dalbeth N, Menz HB, Bassett S, Rome K.
Affiliation: AUT University, Private Bag 92006, Auckland, 1142, New Zealand. krome@aut.ac.nz.

Abstract

BACKGROUND: People with rheumatoid arthritis (RA) have an increased risk of falls. The foot is a common site of pathology in RA and foot problems are reported in up to 90 % of patients with established disease. The aim of this study was to determine whether foot and ankle characteristics are associated with falls in people with RA.

METHODS: Adults with RA were recruited from rheumatology outpatient clinics in Auckland, New Zealand. Participants reported whether they had fallen in the preceding year, and the number of falls. Clinical characteristics, common fall risk factors, and foot and ankle variables were measured. Univariate parametric and non-parametric analysis compared fallers and non-fallers on all variables to determine significant differences. Logistic regression analysis identified variables independently associated with falls.

RESULTS: Two hundred and one participants were prospectively recruited. At least one fall in the preceding 12-months was reported by 119 (59 %) participants. Univariate analysis showed that fallers had significantly longer mean disease duration, more co-morbid conditions, an increase in lower limb tender joints, higher midfoot peak plantar pressures and were more likely to have a history of vascular disease than non-fallers. Fallers also reported greater difficulty with activities of daily living, increased fear of falling and greater self-reported foot impairment. Logistic regression analysis revealed that increased midfoot peak plantar pressures (odds ratio (OR) 1.12 [for each 20 kPa increase], 95 % confidence interval (CI) 1.00-1.25), self-reported foot impairment (OR 1.17 [for each three point increase], 95 % CI 1.05-1.31) and history of vascular disease (OR 3.22, 95 % CI 1.17-8.88) were independently associated with a fall in the preceding 12 months.

CONCLUSIONS: Elevated midfoot peak plantar pressures, self-reported foot impairment and vascular disease are associated with falls in people with RA. Assessment of foot deformity, foot function and self-reported foot impairment may be of benefit when considering falls prevention strategies in

people with RA. TRIAL REGISTRATION: Australia New Zealand Clinical Trial Registry (trial ACTRN12612000597897).
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Geriatric nursing home falls: a single institution cross-sectional study

Botwinick I, Johnson JH, Safadjou S, Cohen-Levy W, Reddy SH, McNelis J, Teperman SH, Stone ME.

Affiliation: Albert Einstein College of Medicine and Jacobi Medical Center, Department of Surgery, 1400 Pelham Parkway South, Bronx, NY 10461, United States. Electronic address: Melvin.Stone@NBHN.net.

Abstract

BACKGROUND: Falls are the leading cause of fatal injury in geriatric patients. Nursing home falls occur at twice the rate of community falls, yet few studies have compared these groups. We hypothesized that nursing home residents admitted for fall would be sicker than their community counterparts on presentation and have worse outcomes.

METHODS: Records of 1708 patients, age 65 years and older with a documented nursing home status, admitted to our center between 2008 and 2012 were reviewed. Clinical data including injury severity score (ISS), admission Glasgow coma scale (GCS), in-hospital complications, length of stay (LOS), and in-hospital mortality were collected. Continuous data were analyzed using Mann-Whitney tests and categorical data using Fisher exact tests. Variables in the univariate tests were analyzed in a multivariate logistic regression.

RESULTS: Nursing home patients were older than community patients, presented with lower GCS, lower hemoglobin, higher international normalized ratio (INR) and a higher percentage of patients with body mass index (BMI)<18.5. LOS for nursing home patients was longer, and they suffered higher rates of in-hospital complications. ISS, rates of traumatic brain injury, operative intervention and mortality were not significantly different. In a multivariate logistic regression, ISS, GCS and age, but not nursing home status, were significant predictors of in-hospital mortality.

CONCLUSIONS: In comparison to their community counterparts, nursing home patients presenting after fall are more debilitated and have increased morbidity as evidenced by more in-house complications and increased LOS. However, nursing home residency was not a significant predictor of mortality.

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Head trauma in elderly patients: mechanisms of injuries and CT findings

Timler D, Dworzyński MJ, Szarpak Ł, Gaszyńska E, Dudek K, Gałązkowski R.

Affiliation: Department of Emergency Medical Service, Medical University of Warsaw, Poland.

Abstract

BACKGROUND: Head injuries in elderly people are a common cause of hospitalization at emergency departments. This group of patients is at high risk of post-traumatic intracranial pathology, which is diagnosed by computed tomography (CT) scanning of the head.

OBJECTIVES: The aim of this study was to determine the incidence and outcomes of head trauma in older people in different scenarios, on the basis of CT scan findings. MATERIAL AND METHODS: The study involved a retrospective analysis of medical records of patients treated in the Emergency Department of Copernicus Memorial Hospital in Lodz, Poland, between the years 2010-2012. Patients above 75 years old whose diagnoses were coded with ICD-10 codes S00-S09 were included in the study. The patients' age, gender, the mechanism and cause of injury, their Glasgow Coma Scale (GCS) score at admission and the results of their head CTs were analyzed.
RESULTS: A total of 301 patients were included in the analysis. Intracranial abnormalities caused by trauma were detected in 24 patients (8%). Transient loss of consciousness (TLOC) was a cause of injury in 44 patients (14.6%) and was related to an increased risk of an abnormal CT scan result (OR 4.6, 95% CI, 1.2-18.4, p < 0.003). Other mechanisms related to an increased risk of post-traumatic intracranial pathology were high-energy mechanisms of injury and unexplained falls.
CONCLUSIONS: Ground-level falls are the most frequent mechanism of head trauma in older people. One of the most commonly identified mechanisms of a fall is TLOC. Head injuries due to TLOC entailed a high risk of intracranial pathology in the elderly population. The risk of trauma-related positive CT scans in patients with unexplained falls is high, and is similar to that observed in patients with TLOC. The highest risk of trauma-related positive CT scans is observed in patients who have suffered a high-energy trauma.
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Influence of a visual-verbal Stroop test on standing and walking performance of older adults

Wollesen B, Voelcker-Rehage C, Regenbrecht T, Mattes K.
Abstract

The dual task (DT) paradigm has been used to investigate decrements in balance performance while walking and standing in fall prevention studies with older adults. However, there are inconsistent findings whether balance performance decreases or increases in DT situations. Following different theoretical models (e.g. limited resource hypothesis or cross domain competition model), these inconsistent findings can be explained by task settings and task complexity. We compared DT performance in an executive control task (Stroop test) while standing and walking to analyze which theoretical model would fit our data best. Twenty-eight persons (>65years) were examined under single task (ST) and DT conditions for standing (sway length and sway velocity) and walking (step length, step width (SW), peak forces of the heel, mid- and forefoot). SW increased from ST to DT conditions, and step length decreased significantly. Maximum forces of the forefoot were reduced whereas the maximum forces of the midfoot increased. Additionally, correct answers of the Stroop test decreased from the ST baseline condition to DT walking. No correlations were found between DT costs (performance decrements) of standing and walking. For both conditions (standing and walking), the limited resources hypothesis fits best. Moreover, not all modified gait variables could be defined as negative DT costs. Increased SW and decreased step length might be used to compensate influences on lateral stability while demands on motor-cognitive resources increase.

Further, drawing conclusions from a standing task for walking conditions might lead to misinterpretations.

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Older adult falls seen by emergency medical service providers: a prevention opportunity

Faul M, Stevens JA, Sasser SM, Alee L, Deokar AJ, Kuhls DA, Burke PA.

Affiliation: Section of Trauma and Acute Care Surgery, Boston Medical Center, Boston University School of Medicine, Boston, Massachusetts.

Abstract

INTRODUCTION: Among people aged ≥65 years, falling is the leading cause of emergency department visits. Emergency medical services (EMS) are often called to help older adults who have fallen, with some requiring hospital transport. Chief aims were to determine where falls occurred and the circumstances under which patients were transported by EMS, and to identify future fall prevention opportunities.

METHODS: In 2012, a total of 42 states contributed ambulatory data to the National EMS Information System, which were analyzed in 2014 and 2015. Using EMS records from 911 call events, logistic regression examined patient and environmental factors associated with older adult transport.

RESULTS: Among people aged ≥65 years, falls accounted for 17% of all EMS calls. More than one in five (21%) of these emergency 911 calls did not result in a transport. Most falls occurred at home (60.2%) and residential institutions such as nursing homes (21.7%). Logistic regression showed AORs for transport were greatest among people aged ≥85 years (AOR=1.14, 95% CI=1.13, 1.16) and women (AOR=1.30, 95% CI=1.29, 1.32); for falls at residential institutions or nursing homes (AOR=3.52, 95% CI=3.46, 3.58) and in rural environments (AOR=1.15, 95% CI=1.13, 1.17); and where the EMS impression was a stroke (AOR=2.96, 95% CI=2.11, 4.10), followed by hypothermia (AOR=2.36, 95% CI=1.33, 4.43).

CONCLUSIONS: This study provides unique insight into fall circumstances and EMS transport activity. EMS personnel are in a prime position to provide interventions that can prevent future falls, or referrals to community-based fall prevention programs and services.

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Older adults' opinions on fall prevention in relation to physical activity level

Tuvemo Johnson S, Martin C, Anens E, Johansson AC, Hellström K.

Affiliation: Uppsala University, Uppsala, Sweden.

Abstract

The purpose of this study was to explore and describe older adults' opinions regarding actions to prevent falls and to analyze differences in the opinions of highly versus less physically active older adults. An open-ended question was answered by 262 individuals aged 75 to 98 years living in the community. The answers were analyzed using qualitative content analysis, and differences in the

categories were compared between highly and less physically active persons. Physical activity was measured according to a five-level scale. The content analysis resulted in eight categories: assistive devices, avoiding hazards, behavioral adaptive strategies, being physically active, healthy lifestyle, indoor modifications, outdoor modifications, and seeking assistance. Behavioral adaptive strategies were mentioned to a greater extent by highly active people, and indoor modifications were more often mentioned by less active older adults. Support for active self-directed behavioral strategies might be important for fall prevention among less physically active older adults.

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Prehospital emergency services screening and referral to reduce falls in community-dwelling older adults: a systematic review

Zozula A, Carpenter CR, Lipsey K, Stark S.

Abstract

BACKGROUND: Falls represent an increasing source of geriatric morbidity and mortality. Prehospital emergency services may be uniquely suited to screen and refer subsets of high-risk older adults to fall prevention programmes. This systematic review assesses the effectiveness of such screening and referral programmes.

METHODS: We searched PubMed, Embase, CINAHL, Web of Science, Scopus, the Cochrane Library and OTseeker for English-language peer-reviewed randomised trials, non-randomised trials and cohort studies evaluating prehospital fall risk screening and referral programmes for community-dwelling adults ≥60 years of age. Risk of bias was assessed using the Cochrane Collaboration's tool. Primary outcomes included the risk and rate of falling. Secondary outcomes included successful follow-up to address fall risks and adverse events.

RESULTS: From 6187 unique records, 6 studies were included. Screening varied from using semistructured risk assessments to recording chief complaints. All studies were at high risk of bias. One unblinded trial of a multifactorial fall prevention programme demonstrated a 14.3% (95% CI 6.1% to 22.5%) absolute reduction in annual fall risk and a relative fall incidence of 0.45 (95% CI 0.35 to 0.58). The probability of successful follow-up varied from 9.8% to 81.0%. No studies demonstrated any attributable adverse events.

CONCLUSIONS: No high-quality evidence demonstrates that prehospital services reduce falls in community-dwelling older adults. Screening by prehospital personnel using semistructured risk assessments appears feasible, but it is unclear whether this is superior to referral based on fall-related chief complaints. TRIAL REGISTRATION NUMBER: PROSPERO 2012:CRD42012002782.

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Race and fall risk: data from the National Health and Aging Trends Study (NHATS)

Sun DQ, Huang J, Varadhan R, Agrawal Y.

Affiliation: Department of Otolaryngolgoy-Head and Neck Surgery, Johns Hopkins University School of Medicine, Baltimore, MD, USA The Center on Aging and Health, Johns Hopkins University School of Medicine, Baltimore, MD, USA.
Abstract

OBJECTIVES: the objective of this study was to explore whether race-based difference in fall risk may be mediated by environmental and physical performance risk factors.

METHODS: using data from a nationally representative longitudinal survey of 7,609 community-dwelling participants in the National Health and Aging Trends Study (NHATS), we evaluated whether racial differences in fall risk may be explained by physical performance level (measured by the Short Physical Performance Battery), mobility disability, physical activity level and likelihood of living alone. Multivariate Poisson regression and mediation models were used in analyses.

RESULTS: in whites and blacks, the annual incidence of 'any fall' was 33.8 and 27.1%, respectively, and the annual incidence of 'recurrent falls' was 15.5 and 12.3%, respectively. Compared with whites, blacks had relative risks of 0.7 (95% confidence interval 0.6-0.8) and 0.6 (0.5-0.8) for sustaining any fall and recurrent falls, respectively, in adjusted analyses. Blacks had poorer performance on the SPPB (P < 0.001), higher levels of mobility disability (P < 0.001), similar levels of physical activity (P = 0.19) and were equally likely to live alone relative to whites (P = 0.77). Mediation analysis revealed that these risk factors collectively acted as suppressors and none of these factors accounted for the racial differences in fall risk observed.

CONCLUSIONS: relative to whites, blacks were at 30 and 40% decreased risk of sustaining any fall and recurrent falls, respectively. This difference in risk remains unexplained.

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Rationale for strengthening muscle to prevent falls and fractures: a review of the evidence
Benichou O, Lord SR. Calcif. Tissue Int. 2016; ePub(ePub): ePub.
Affiliation: NeuRA, UNSW, Sydney, NSW, Australia.
Abstract

Falls represent a major public health problem in older people, predominantly due to the resulting injuries which lead to progressive disability, immobilization and resulting comorbidities, dependency, institutionalization, and death. Reduced muscle strength and power have been consistently identified as risk factors for falls and related injuries, and it is likely these associations result from the central role played by reduced muscle strength and power in poor balance recovery. In addition, muscle strength and power are involved with protective responses that reduce the risk of an injury if a fall occurs. Progressive resistance training (PRT) is the standard way to increase muscle strength and power, and this training forms one of the main components of fall prevention exercise interventions. However, PRT has rarely been implemented in routine practice due to multiple challenges inherent to frail older people. The ongoing development of drugs expected to increase muscle power offers a new opportunity to reduce the risk of falls and fall-related injuries. The intent here is not to replace exercise training with drugs but rather to offer a pharmacologic alternative when exercise is not possible or contraindicated. The target population would be those most likely to benefit from this mechanism of action, i.e., weak older people without major causes

for falls independent of muscle weakness. Provided such a tailored strategy was followed, a muscle anabolic may address this major unmet need.

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Rising incidence of fall-induced maxillofacial injuries among older adults

Kannus P, Niemi S, Parkkari J, Sievänen H.

Affiliation: Injury and Osteoporosis Research Center, UKK Institute for Health Promotion Research, P.O. Box 30, 33501, Tampere, Finland.

Abstract

BACKGROUND: Various fall-induced injuries in older adults are a major public health problem.

AIM: We aimed to assess the current trends in the fall-induced severe maxillofacial injuries among older adults in Finland, an EU country with a well-defined white population of 5.5 million.

METHODS: The injury trends were determined by taking into account all persons 60 years of age or older who were admitted to Finnish hospitals for primary treatment of these injuries between 1999 and 2014.

RESULTS: The number of fall-induced maxillofacial injuries among older Finnish adults doubled during the 16-year follow-up, from 434 in 1999 to 981 in 2014. The age-adjusted incidence of injury (per 100 000 persons) also showed a clear increase from 1999 to 2014: from 47.4 to 71.3 in women, and from 39.2 to 59.6 in men. In both sexes, the increase was most prominent in the oldest age group, persons aged 80 years or older.

CONCLUSIONS: The number of fall-induced severe maxillofacial injuries among older Finns rose considerably between 1999 and 2014-with a rate that could not be explained merely by demographic changes. Further studies are urgently needed to better assess the reasons for the rise and possibilities for injury prevention.

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Screening for fall risks in the emergency department: a novel nursing-driven program

Huded JM, Dresden SM, Gravenor SJ, Rowe T, Lindquist LA.

Affiliation: Northwestern University Feinberg School of Medicine, Department of Medicine, Division of General Internal Medicine and Geriatrics, Chicago, Illinois.

Abstract

INTRODUCTION: Seniors represent the fasting growing population in the U.S., accounting for 20.3 million visits to emergency departments (EDs) annually. The ED visit can provide an opportunity for identifying seniors at high risk of falls. We sought to incorporate the Timed Up & Go Test (TUGT), a commonly used falls screening tool, into the ED encounter to identify seniors at high fall risk and prompt interventions through a geriatric nurse liaison (GNL) model.

METHODS: Patients aged 65 and older presenting to an urban ED were evaluated by a team of ED nurses trained in care coordination and geriatric assessment skills. They performed fall risk screening with the TUGT. Patients with abnormal TUGT results could then be referred to physical therapy (PT),

social work or home health as determined by the GNL.

RESULTS: Gait assessment with the TUGT was performed on 443 elderly patients between 4/1/13 and 5/31/14. A prior fall was reported in 37% of patients in the previous six months. Of those screened with the TUGT, 368 patients experienced a positive result. Interventions for positive results included ED-based PT (n=63, 17.1%), outpatient PT referrals (n=56, 12.2%) and social work consultation (n=162, 44%).

CONCLUSION: The ED visit may provide an opportunity for older adults to be screened for fall risk. Our results show ED nurses can conduct the TUGT, a validated and time efficient screen, and place appropriate referrals based on assessment results. Identifying and intervening on high fall risk patients who visit the ED has the potential to improve the trajectory of functional decline in our elderly population.

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State fall prevention coalitions as systems change agents: an emphasis on policy

Schneider EC, Smith ML, Ory MG, Altpeter M, Beattie BL, Scheirer MA, Shubert TE.

Abstract

BACKGROUND: Falls among older adults are an escalating public health issue, which requires a multidisciplinary and multilevel approach to affect systems change to effectively address this problem. The National Council on Aging established the Falls Free® Initiative, enfolding and facilitating statewide Fall Prevention Coalitions. Fall Free® activities included developing the State Policy Toolkit for Advancing Falls Prevention to promote sustainable change by supporting the dissemination and adoption of evidence-based strategies.

PURPOSE: To (1) determine if the policies being implemented were recommended and supported by the Toolkit, (2) identify the perceived barriers and facilitators to implementing policies, and (3) identify Coalitions' current and future fall prevention policy activities.

METHODS: A 63-item online survey was distributed to State Coalition Leads. Descriptive statistics (frequencies and counts) were used to describe Coalition characteristics and activities.

RESULTS: Coalitions had several similarities, and varied greatly in their number of member organizations and members as well as meeting frequencies. Key activities included building partnerships, disseminating programs, and pursuing at least one of the eight National Council on Aging-recommended policy goals. The most commonly reported facilitator was active support from the Coalition Leads, whereas the lack of funding was the most cited barrier.

CONCLUSION: This study serves as the first national census of empirical evidence regarding Falls Coalitions' composition, goals, and activities. Results indicate that Coalitions are actively pursuing evidence-based policies but could benefit from additional technical assistance and resources. Findings support the value of Toolkit recommendations by documenting what is feasible and being implemented. Knowledge about facilitators and barriers will inform future efforts to foster sustainable systems change in states with active Coalitions and encourage Coalitions in other states.

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The ageing population is neglected in research studies of traumatic brain injury

Gaastra B, Longworth A, Matta B, Snelson C, Whitehouse T, Murphy N, Veenith T.

Affiliation: Department of Critical Care Medicine , University Hospitals Birmingham NHS Trust , Birmingham , UK.

Abstract

INTRODUCTION: The UK population is ageing with increasing number of elderly patients suffering traumatic brain injury (TBI). The purpose of this study was to identify national TBI admission demographics, analyse the temporal evolution of TBI mortality in a single centre and conduct a systematic review of the literature to identify whether there is an age bias amongst researchers studying TBI.

METHODS: National demographics for TBI were obtained from Health Episode Statistics. TBI patients admitted from 2000 to 2011 to Cambridge University Hospitals Neurocritical Care Unit (NCCU) were divided into age groups (<60, 60-74, ≥75 years). Temporal evolution of mortality was analysed using a logistic regression method. A systematic literature review was conducted to identify primary TBI research studies. Patient's ages were extracted and an average mean age was calculated and compared over time.

RESULTS: From 1998, national TBI admissions have increased with the greatest rise in >60-year age group (p < 0.0001). In a tertiary referral critical care unit (n = 1145), the 60-74 year age group (compared to <60) had a significantly lower improvement in mortality over time (OR: 1.15, 95% CI: 1.02-1.31). A literature review revealed a mean age of 32.73 years (SD ± 12.85) for patients recruited to primary TBI studies.

CONCLUSION: Despite increased admissions of elderly patients following TBI and static mortality (single centre, 60-74 year age group) there is little or no evidence of a corresponding increase in the age of patients recruited for TBI studies. In addition to the difficulties this presents in forming evidence-based decisions for the patient with TBI, it may also represent a wider problem for ICU research in an ever-ageing critical care population. More research needs to be conducted to establish the treatment end points for an ageing population.

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Walking ability before and after a hip fracture in elderly predict greater long-term survivorship

Iosifidis M, Iliopoulos E, Panagiotou A, Apostolidis K, Traios S, Giantsis G.

Affiliation: Orthopaedic Department of Naoussa G.H., Naoussa, Greece.

Abstract

AIM: The morbidity and mortality after a hip fracture in the elderly population are multifactorial. The aim of this study is to determine the long-term impact of specific factors to mortality rate and mobility after a hip fracture in the elderly.

MATERIALS AND METHODS: Elderly suffering a hip fracture after a low-energy trauma was included in the study, whereas moribund patients with severe comorbid conditions and high-energy trauma were excluded. All the patients were treated operatively during 2003. Data for survivorship and

mobilization was collected six months, one and ten years after the operation. Kaplan-Meier log rang test was used for the survival analysis and cox regression for multivariate analysis of prediction factors such as age, gender, time to surgery after trauma, type of fracture, ambulation status before injury and early walking ability after the surgery.

RESULTS: Two hundred and thirty three patients were finally included to the study. Gender (p = 0.64) and type of fracture (p = 0.92) seem to have no statistically significant impact on survivorship. Age (p < 0.001), time of surgery after the trauma (p = 0.001), ambulation status (p < 0.001) and early walking ability after the surgery (p < 0.001) seem to have statistically significant impact on mortality, as independent factors. The significance is present one year and ten years after the surgery. However, according to the multivariate analysis, time to surgery after trauma and age lose significance, while early walking ability remain significant one and ten years after surgery (p < 0.001). Ambulation status seem to lose significance early after surgery, but reach significance ten years postoperatively (p < 0.001).

CONCLUSION: In summary, it could be stated that early walking ability after an operation for a hip fracture in elderly is the most significant prediction factor of survivorship one and ten years postoperatively. Ambulation status before injury is a significant long-term predictor factor for survivorship.

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Wrist fractures and their impact in daily living functionality on elderly people: a prospective cohort study

Vergara I, Vrotsou K, Orive M, Garcia-Gutierrez S, Gonzalez N, Las Hayas C, Quintana JM.
BMC Geriatr. 2016; 16(1): e11.
Affiliation: Unidad de Investigación, Hospital Galdakao-Usansolo, Red de Investigación en Servicios Sanitarios y Enfermedades Crónicas (REDISSEC), Galdakao, Bizkaia, Spain.
josemaria.quintanalopez@osakidetza.net.

Abstract

BACKGROUND: Wrist fractures are the most common arm fractures in older adults. The impact of wrist fractures on daily functionality has been less studied than that of other types and so, less is known about the complexity of factors related to the functional impact of these fractures. This study is aimed to assess the role of individual and health care factors and its association with daily living functional changes after a wrist fracture.

METHODS: A prospective cohort of patients aged 65 or more, affected by a fracture due to a fall, was conducted. These patients were identified at the emergency rooms of the six participating hospitals. As independent factors, the following were studied: socio-demographic data, characteristics of the fracture, health-related quality of life, wrist function and provided treatment. The main outcome was functional status measured by the Barthel Index for daily living basic activities and the Lawton Instrumental Activities of Daily Living (IADL) Scale for daily living instrumental activities. Data were collected at baseline just after the fall and after six months of follow-up. Patients were considered to have deteriorated if their functional status as measured by Barthel Index or Lawton IADL scores decreased in a significant way during the six months of follow up.

RESULTS: Barthel Index and/or Lawton IADL scores fell at six months after the fracture in 33 % of

participants. This functional decline was more frequent in patients with comorbidity (p < 0.0001), polypharmacy (p < 0.0001), low health-related quality of life prior to the fall (p < 0.0001) and lower educational level (p = 0.009). The derived multivariate models show that patients that become dependent six months after the fall, have advanced age, severe chronic diseases, low functional performance prior to the fracture, and repeated episodes of accidental falls. This profile is consistent with a frailty phenotype.

CONCLUSIONS: Wrist fractures are associated to the occurrence of dependence, especially in frail patients. These patients could benefit from being identified at the time the fracture is treated, in order to tackle their complex needs and so, prevent some of the burden of dependence generated by these fractures.

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Years of life lost due to lower extremity injury in association with dementia, and care need: a 6-year follow-up population-based study using a multi-state approach among German elderly

Zhou Y, Putter H, Doblhammer G.

Affiliation: German Center for Neurodegenerative Disease, Ludwig-Erhard-Allee 2, 53175, Bonn, Germany. doblhammer@rostockerzentrum.de.

Abstract

BACKGROUND: Dementia and care need are challenging aging populations worldwide. Lower extremity injury (LEI) in the elderly makes matters worse. Using a multi-state approach, we express the effect of LEI on dementia, care need, and mortality in terms of remaining life expectancy at age 75 (rLE) and years of life lost (YLL).

METHODS: A population-based random sample of beneficiaries aged 75-95 years was drawn from the largest public health insurer in Germany in 2004 and followed until 2010 (N 62,103; Mean Age ± SD 81.5 ± 4.8 years; Female 71.2 %). We defined a five-state model (Healthy, Dementia, Care, Dementia & Care, Dead), and calculated transition-specific hazard ratios of LEI using Cox regression. The transition probabilities as well as the YLL due to LEI were estimated.

RESULTS: LEI significantly increased the risk for each transition, with a maximum risk for the transition from Healthy to Care (HR: 1.70, 95 % CI: 1.63-1.77) and a minimum risk for the transition from Care to Dead (HR: 1.16, 95 % CI: 1.10-1.22). If the elderly had LEI-history, their age-specific mortality was generally higher and their probabilities of transient states peaked at younger ages. At age 75, initially dementia-free and care-independent elderly experiencing LEI lost about 2 years of life, of which more than 90 % were life years free of dementia or care need. Dementia patients lost about one and a half year, more than 60 % were free of long-term care need.

CONCLUSIONS: LEI not only casts a large health burden on care need, but is also associated with cognitive decline and shortened rLE. LEI plus dementia extend the relative life time in need of care, despite generally shortening rLE. Using the composite measure YLL may help to better convey these results to the elderly, families, and health professionals. This may strengthen preventive measures as well as improve timely and rehabilitative treatment of LEI, not only in cognitive and physically intact elderly.

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A preliminary study on the efficacy of a community-based physical activity intervention on physical function-related risk factors for falls among breast cancer survivors

Lee CE, Warden SJ, Szuck B, Lau YK.

Affiliation: From the School of Medical Rehabilitation Sciences, University of Manitoba, Winnipeg, Manitoba, Canada (CEL); School of Health and Rehabilitation Sciences, Indiana University, Indianapolis, Indiana (SJW); Winnipeg Regional Health Authority Breast Health Centre, Winnipeg, Manitoba, Canada (BS); and Department of Hematology/Oncology, CancerCare Manitoba, Winnipeg, Manitoba, Canada (YKJL).

Abstract

OBJECTIVE: The aim of this study was to examine the effects of a 6-week community-based physical activity (PA) intervention on physical function-related risk factors for falls among 56 breast cancer survivors (BCS) who had completed treatments.

DESIGN: This was a single-group longitudinal study. The multimodal PA intervention included aerobic, strengthening, and balance components. Physical function outcomes based on the 4-meter walk, chair stand, one-leg stance, tandem walk, and dynamic muscular endurance tests were assessed at 6-week pre-intervention (T1), baseline (T2), and post-intervention (T3). T1 to T2 and T2 to T3 were the control and intervention periods, respectively.

RESULTS: All outcomes, except the tandem walk test, significantly improved after the intervention period (P < 0.05), with no change detected after the control period (P > 0.05). Based on the falls risk criterion in the one-leg stance test, the proportion at risk for falls was significantly lower after the intervention period (P = 0.04), but not after the control period.

CONCLUSIONS: A community-based multimodal PA intervention for BCS may be efficacious in improving physical function-related risk factors for falls, and lowering the proportion of BCS at risk for falls based on specific physical function-related falls criteria. Further larger trials are needed to confirm these preliminary findings.

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Gait and balance assessments as early indicators of frailty in patients with known peripheral artery disease

Thiede R, Toosizadeh N, Mills JL, Zaky M, Mohler J, Najafi B.

Affiliation: Interdisciplinary Consortium on Advanced Motion Performance (iCAMP) and Southern Arizona Limb Salvage Alliance (SALSA), Department of Surgery, College of Medicine, University of Arizona, Tucson, AZ, USA; Arizona Center on Aging, University of Arizona, Tucson, AZ, USA; Division of Vascular Surgery and Endovascular Therapy, Michael E. DeBakey Department of Surgery, Baylor College of Medicine, Houston, TX, USA. Electronic address: najafi.bijan@gmail.com.

Abstract

BACKGROUND: Peripheral artery disease is associated with increased morbidity and mortality, and frailty syndrome may mediate the risk of these adverse health outcomes to predict intervention results. The aim of this study was to determine the association between motor performance

impairments based on in-clinic gait and balance measurements with frailty at intermediate stages (pre-frailty) in peripheral artery disease patients.

METHODS: Seventeen participants with peripheral artery disease (≥55years) were recruited and frailty assessed using Fried criteria. Gait and balance were quantified using wearable sensor technologies in the clinical setting. Between-group differences in frailty were assessed using analysis of variance, and independent associations between gait and balance parameters with frailty were determined using logistic regression models.

FINDINGS: Based on Fried index nine (53%), participants were pre-frail and eight (47%) were non-frail. Although no between-group differences in demographics or clinical parameters was observed, gait parameters were worse among pre-frail compared to non-frail participants. The highest effect sizes for between-group differences were observed in double support during habitual normal walking (effect size=1.86, p<0.01), speed variability during dual-task (effect size=1.26, p=0.03), and trunk sway during fast walking (effect size=1.43, p=0.02). No significant difference was observed in balance parameters (p>0.07). The regression model using gait parameters demonstrated a high sensitivity and specificity in predicting pre-frailty.

INTERPRETATION: A short 25-step sensor-based in-clinic overground gait test objectively identified pre-frailty independent of age. Double support was the most sensitive parameter in identifying pre-frail aging adults.

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Postural instability in patients with injury of corticoreticular pathway following mild traumatic brain injury

Jang SH, Kim TH, Kwon YH, Lee MY, Lee HD.

Affiliation: From the Department of Physical Medicine and Rehabilitation, College of Medicine, Yeungnam University (SHJ, HDL); Department of Physical Therapy, College of Rehabilitation Science, Daegu University (THK); Department of Physical Therapy, Yeungnam College of Science & Technology (YHK); and Department of Physical Therapy, College of Health and Therapy, Daegu Haany University (MYL).

Abstract

OBJECTIVE: We attempted to investigate postural instability in patients with injury of the corticoreticular pathway (CRP) after mild traumatic brain injury.

METHODS: The CRP was reconstructed, and the fractional anisotropy value, apparent diffusion coefficient value, and fiber volume of the CRP were measured. For evaluation of postural instability, both the Balance Error Scoring System score and the displacement of center of pressure were measured.

RESULT: Significantly lower tract volume of the CRP was observed in the patient group than in the control group with no significant difference in fractional anisotropy and apparent diffusion coefficient values(P > 0.05). The results of the Balance Error Scoring System shown on a firm and foam surface were significantly higher in the patient group than in the control group (P < 0.05). Significant increments in displacement of center of pressure for 3 stances of double-leg, single-leg, and tandem stances in distance, maximum distance, and path length were observed in the patient group compared with the control group (P < 0.05). By contrast, no significant difference in the

double stance on the x axis of the distance was observed between the patient and control groups (P > 0.05).

CONCLUSION: We demonstrated postural instability in patients with injury of the CRP following mild traumatic brain injury.

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Study protocol of a randomized clinical trial evaluating the effectiveness of a primary care intervention using the Nintendo™ Wii console to improve balance and decrease falls in the elderly

Montero-Alía P, Muñoz-Ortiz L, Jiménez-González M, Benedicto-Pañell C, Altimir-Losada S, López-Colomer Y, Prat-Rovira J, Amargant-Rubio JF, Jastes SM, Moreno-Buitrago A, Rodríguez-Pérez MC, Teixidó-Vargas C, Albarrán-Sánchez JL, Candel-Gil A, Serra-Serra D, Martí-Cervantes JJ, Sánchez-Pérez CA, Sañudo-Blanco L, Dolader-Olivé S, Torán-Monserrat P.

Affiliation: Primary Healthcare Research Support Unit Metropolitana Nord, Institute of Primary Care Research (IDIAP) Jordi Gol, Calle Major 49-53, 08921, Santa Coloma de Gramenet, Spain. ptoran.bnm.ics@gencat.cat.

Abstract

BACKGROUND: Balance alteration is a risk factor for falls in elderly individuals that has physical, psychological and economic consequences. The objectives of this study are to evaluate the usefulness of an intervention utilizing the Nintendo™ Wii console in order to improve balance, thereby decreasing both the fear of falling as well as the number of falls, and to evaluate the correlation between balance as determined by the console and the value obtained in the Tinetti tests and the one foot stationary test.

METHODS/DESIGN: This is a controlled, randomized clinical trial of individual assignment, carried out on patients over 70 years in age, from five primary care centers in the city of Mataró (Barcelona). 380 patients were necessary for the intervention group that carried out the balance board exercises in 2 sessions per week for a 3 month period, and 380 patients in the control group who carried out their usual habits. Balance was evaluated using the Tinetti test, the one foot stationary test and with the console, at the start of the study, at the end of the intervention (3 months) and one year later. Quarterly telephone follow-up was also conducted to keep track of falls and their consequences.

DISCUSSION: The study aimed to connect the community with a technology that may be an easy and fun way to assist the elderly in improving their balance without the need to leave home or join rehabilitation groups, offering greater comfort for this population and decreasing healthcare costs since there is no need for specialized personnel. TRIAL REGISTRATION: Current Control Trial NCT02570178.

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The effect of sleep medication use and poor sleep quality on risk of falls in community-dwelling older adults in the US: a prospective cohort study

Min Y, Kirkwood CK, Mays DP, Slattum PW.

Affiliation: Department of Pharmacotherapy and Outcomes Sciences, School of Pharmacy, Virginia Commonwealth University, 410 N 12th Street, PO Box 980533, Richmond, VA, 23298-0533, USA. pwslattu@vcu.edu.

Abstract

BACKGROUND: Sleep complaints and the consumption of medications for sleep are common in older adults. Falls are also a significant concern for older adults and sedative use has been identified as a risk factor for falls. Sleep quality is a potential confounder in studies evaluating the relationship between sleep medication use and falls. However, very few studies have assessed the combined impact of sleep medication use and sleep quality on the risk of falls.

OBJECTIVE: The objective of this study was to evaluate the association between sleep medication use, poor sleep quality, and falls in community-dwelling older adults.

METHODS: This was a multicenter, 6-month prospective cohort study conducted in senior housings settings in central Virginia, USA. Sleep quality was assessed using the Pittsburgh Sleep Quality Index (PSQI) and a medication review was conducted. Data regarding falls were collected over 6 months by use of a diary. Logistic regression modeling was used to examine the effects of poor sleep quality, sleep medication use, and both, on the risk of falls.

RESULTS: Among 113 independently living older adults (mean age ± standard deviation 81.1 ± 8.6), 46.9 % fell at least once during a 6-month period; 62.8 % (n = 71) had poor sleep quality, and 44.2 % (n = 50) used medications or treatments to aid sleep. Compared with participants reporting good sleep quality and no sleep medication use, those who reported poor sleep quality and sleep medication use had an increased risk of falls after adjusting for covariates (odds ratio 3.23, 95 % confidence interval 1.05-9.91). The group with good sleep quality and sleep medication use, as well as the group with poor sleep quality and no sleep medication use had no significantly greater risk for falls compared with the group with good sleep quality and no sleep medication use.

CONCLUSION: A combined effect of sleep quality and sleep medication use on the risk of falls suggests that medication effectiveness may be an important factor to consider in understanding the risk of falls associated with sedative medications.

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