

SafetyLit April 29th 2018

A falls case summary: application of the public health nursing intervention wheel

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DOI 10.1111/phn.12408 **PMID** 29676488

Abstract

BACKGROUND: The Public Health Intervention Wheel (PHIW) is a population-based practice model that encompasses three levels of practice (community, systems, and individual/family) and 17 public health interventions. Each intervention and practice level contributes to improving population health. Public health nurses (PHNs) provide care at the three levels of practice. Prevention of falls is a public health issue and the majority of falls happen at home. Therefore, prevention and management of falls in the community could benefit from a public health systems approach by PHNs underpinned by the PHIW.

CASE PRESENTATION: A hypothetical case is presented of a 78-year-old gentleman who had a fall which resulted in a fractured right acetabulum and surgery before being discharged home.

METHODS: The aim of this paper was to use a case summary to illustrate PHN practice in the context of the PHIW as applied to falls management and prevention. This paper focuses on fall incidence and PHN response in Ireland and Norway. The PHIW is described and relevant interventions from the PHIW are applied to PHN practice in managing the case.

CONCLUSIONS: The PHIW model provides insight into the potential scope of public health nursing in falls, articulating PHN practice in the community.

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A novel detection model and its optimal features to classify falls from low- and high-acceleration activities of daily life using an insole sensor system

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Sensors (Basel) 2018; 18(4): s18041227.

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Abstract

In order to overcome the current limitations in current threshold-based and machine learning-based fall detectors, an insole system and novel fall classification model were created. Because high-acceleration activities have a high risk for falls, and because of the potential damage that is associated with falls during high-acceleration activities, four low-acceleration activities, four high-

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acceleration activities, and eight types of high-acceleration falls were performed by twenty young male subjects. Encompassing a total of 800 falls and 320 min of activities of daily life (ADLs), the created Support Vector Machine model's Leave-One-Out cross-validation provides a fall detection sensitivity (0.996), specificity (1.000), and accuracy (0.999). These classification results are similar or superior to other fall detection models in the literature, while also including high-acceleration ADLs to challenge the classification model, and simultaneously reducing the burden that is associated with wearable sensors and increasing user comfort by inserting the insole system into the shoe.

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Absolute risk-based treatment using adaptive blood pressure thresholds and targets is crucial to older multimorbid patients with high fall risk

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Hypertension 2018; ePub(ePub): ePub.

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DOI 10.1161/HYPERTENSIONAHA.118.11297 **PMID** 29686014

Abstract [

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Ageing vision and falls: a review

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J. Physiol. Anthropol. 2018; 37(1): e11.

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(Copyright © 2018, Japan Society of Physiological Anthropology)

DOI 10.1186/s40101-018-0170-1 **PMID** 29685171

Abstract

BACKGROUND: Falls are the leading cause of accidental injury and death among older adults. One of three adults over the age of 65 years falls annually. As the size of elderly population increases, falls become a major concern for public health and there is a pressing need to understand the causes of falls thoroughly. While it is well documented that visual functions such as visual acuity, contrast sensitivity, and stereo acuity are correlated with fall risks, little attention has been paid to the relationship between falls and the ability of the visual system to perceive motion in the environment. The omission of visual motion perception in the literature is a critical gap because it is an essential function in maintaining balance. In the present article, we first review existing studies regarding visual risk factors for falls and the effect of ageing vision on falls. We then present a group of phenomena such asvection and sensory reweighting that provide information on how visual motion signals are used to maintain balance.

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CONCLUSION: We suggest that the current list of visual risk factors for falls should be elaborated by taking into account the relationship between visual motion perception and balance control.

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Association between vision-specific quality of life and falls in community-dwelling older adults:

LOHAS

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PLoS One 2018; 13(4): e0195806.

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(Copyright © 2018, Public Library of Science)

DOI 10.1371/journal.pone.0195806 **PMID** 29689064

Abstract

BACKGROUND: Falls and fall-related fractures are a major public health problem among the older adults. Although objective measures of poor vision have been reported to be associated with falls, the association of self-reported visual function and vision-specific quality of life (QOL) with falls has been inconsistent across several studies. We investigated the association of self-reported visual function and vision specific QOL with falls in community-dwelling older adults.

METHODS: We conducted a cross-sectional analysis using the baseline data from participants of the Locomotive Syndrome and Health Outcome in Aizu Cohort Study (LOHAS), which is an ongoing population-based cohort study to evaluate the association of physical dysfunction with the clinical outcomes in community-dwelling people. In the present study, the participants aged over 65 years in 2010 were eligible. The exposure variable was the composite score of the VFQ-J11, which was newly developed using item response theory to evaluate vision specific QOL, and the self-reported outcomes were any fall and frequent falls (≥ 2) over a 1-month period. We estimated odds ratios using separate logistic regression models adjusted for relevant confounding factors.

RESULTS: Among 1624 participants, the median (interquartile range) composite score of VFQ-J11 was 86.8 (76.0-95.9). Any fall and frequent falls were reported by 13.9% and 5.4% of participants, respectively. The composite score of the VFQ-J11 was significantly associated with both frequent falls (adjusted ORs per 10 points, 0.80; 95% CI, 0.68-0.93) and any fall (adjusted ORs per 10 points, 0.84; 95% CI, 0.76-0.94).

CONCLUSIONS: We found that the composite score of the VFQ-J11 was associated with falls in community-dwelling older adults. Detecting individuals with visual impairments associated with falls using the VFQ-J11 and improvement in the score by interventions could prevent falls. We may consider adding self-reported visual function and vision-specific QOL to conventional risk factors for fall among older adults.

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Cognitive profiles of older adults with a prior traumatic brain injury versus healthy controls: a meta-analysis

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Brain Inj. 2018; ePub(ePub): ePub.

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DOI 10.1080/02699052.2018.1463104 **PMID** 29676934

Abstract

OBJECTIVE: To determine cognitive outcomes in older adults (≥ 50 years old) having sustained a traumatic brain injury (TBI) using meta-analysis.

METHODS: MedLine and PsycInfo databases were searched to identify studies comparing neuropsychological profiles in older adults with and without a history of TBI across various injury severities and times post-injury. Ten studies ($n = 717$) meeting inclusion criteria were identified. Tests were divided into functional modalities and average effect sizes were calculated across studies on a test-by-test basis.

RESULTS: Older adults post-TBI performed worse than the non-TBI group on all cognitive outcomes evaluated ($d = -0.34$ to -0.75), with naming and vocabulary having the largest effect, $M -0.75$ (95% CI, -0.98 to -0.52).

CONCLUSIONS: TBI in older adults leads to moderate deficits on all measured cognitive abilities, with the largest effects observed in naming and vocabulary abilities. The findings pertain broadly to TBI of mixed injury severities and times post-injury, although the majority of participants sustained TBIs of mild uncomplicated severity within one-year post-injury. Future research must address methodological limitations such as variability in reporting injury information, inconsistency in defining older age, and lack of orthopaedic comparison groups in order to permit more nuanced conclusions for this population.

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Daily step count and all-cause mortality in a sample of Japanese elderly people: a cohort study

Yamamoto N, Miyazaki H, Shimada M, Nakagawa N, Sawada SS, Nishimuta M, Kimura Y, Kawakami R, Nagayama H, Asai H, Lee IM, Blair SN, Yoshitake Y.

BMC Public Health 2018; 18(1): e540.

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DOI 10.1186/s12889-018-5434-5 **PMID** 29685125

Abstract

BACKGROUND: This study aimed to examine the relationship between pedometer-assessed daily step count and all-cause mortality in a sample of elderly Japanese people.

METHODS: Participants included 419 (228 males and 191 females) physically independent, community-dwelling 71-year-old Japanese people. The number of steps per day was measured by a waist-mounted pedometer for seven consecutive days at baseline. Participants were divided into quartiles based on their average number of steps/day (first quartile, < 4503 steps/day; second

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quartile, 4503-6110 steps/day; third quartile, 6111-7971 steps/day; fourth quartile, > 7972 steps/day) and were followed up over a mean period of 9.8 years (1999-2010) for mortality. RESULTS: Seventy-six participants (18.1%) died during the follow-up period. The hazard ratios (adjusted for sex, body mass index, cigarette smoking, alcohol intake, and medication use) for mortality across the quartiles of daily step count (lowest to highest) were 1.00 (reference), 0.81 (95%CI, 0.43-1.54), 1.26 (95%CI, 0.70-2.26), and 0.46 (95%CI, 0.22-0.96) (P for trend = 0.149). Participants in the highest quartile had a significantly lower risk of death compared with participants in the lowest quartile.

CONCLUSION: This study suggested that a high daily step count is associated with a lower risk of all-cause mortality in physically independent Japanese elderly people.

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David Oliver: Falls in older people-can we really make a difference?

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BMJ 2018; 361: k1655.

Affiliation: Berkshire.

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Abstract

This month an Observer headline reported a 177% increase in deaths from falls among men over 85 from 2008 to 2016, although the population of over 85s rose only 19%. It linked the story to serious cuts in social care funding and provision in that period: a fall from 15% to 9% of over 65s receiving council funded care. It's hard to establish a causal link, but the story highlights the importance of falls to our health and care services.

Around a third of over 65s and half of over 80s fall at least once a year, and half fall again in the same year. Falls are the leading cause of death from injury in over 70s and account for around half of all hospital admissions for injury. Even "minor" soft tissue injuries can be disabling in frailer older people, and falls can lead to loss of confidence and independence.

Falls lead to fractures, including around 80 000 hip fractures a year in the UK and a further 200 000 non-hip fractures.

For several years the Department of Health and national arm's length bodies have led programmes on prevention, assessment, and treatment of people with falls and fragility fractures, with the momentum around this issue including a coalition of interested professional bodies and charities. The Royal College of Physicians (RCP) leads a long running national audit of falls and fragility fractures, and NICE has guidelines on them. Outcomes and processes for patients with hip fractures have improved.

Falls result from individual patients' risk factors, the activities they engage in, and their physical environment. As such, fall prevention is ideal territory for structured, multidisciplinary, comprehensive geriatric assessment and tailored interventions for each risk factor. And it's amenable to well evidenced single interventions—most notably, structured strength and balance training exercise, which can be formally supervised by trained instructors who needn't be clinicians.

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Does functional capacity, fall risk awareness and physical activity level predict falls in older adults in different age groups?

Moreira NB, Rodacki ALF, Pereira G, Bento PCB.

Arch. Gerontol. Geriatr. 2018; 77: 57-63.

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(Copyright © 2018, Elsevier Publishing)

DOI 10.1016/j.archger.2018.04.002 **PMID** 29673964

Abstract

The aims of this study were to examine whether: i) functional capacity and physical activity level differ between fallers and non-fallers older adults, by controlling for fall risk awareness; ii) functional capacity, fall risk awareness and physical activity differ between fallers and non-fallers older adults, by controlling for age; iii) variables and which may predict falls in different age groups. 1826 older adults performed a series of functional tests and reported their fall episodes, fall risk awareness and physical activity level. The overall incidence of falls was high (40.2%), and falls risk awareness scores reduced with age. The older adults with greater falls risk awareness and non-fallers presented better scores in all functional tests and physical activity level ($P < .05$). Functional tests and falls risk awareness differed among age groups and differed between fallers and non-fallers, irrespective of age group ($P < .05$). Falls risk awareness predicted falls in all age groups (odds ranging: 1.05-1.09). Handgrip strength and balance scores predicted falls until 79 years (OR = 1.04, 95%CI = 1.01-1.06). The physical activity level predicted falls up to 70 years (OR = 1.09, 95%CI = 1.06-1.12). Functional mobility was able to predict falls up to 80 years (OR = 1.06, 95%CI = 1.01-1.08). Therefore, according to age, functional capacity, physical activity level and falls risk awareness can be a predictor of falls in older adults.

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Effects of physical training with the Nintendo Wii Fit Plus[®] and protein supplementation on musculoskeletal function and the risk of falls in pre-frail older women: protocol for a randomized controlled clinical trial (the WiiProtein study)

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Maturitas 2018; 111: 53-60.

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DOI 10.1016/j.maturitas.2018.02.013 **PMID** 29673832

Abstract

BACKGROUND: Frailty is one of the key geriatric syndromes and is related to the loss of functional independence. However, the practice of physical training (PT) combined with protein supplementation (PS) may improve musculoskeletal function (MF).

OBJECTIVE: To verify the effect of PT using 'exergames' with or without PS on MF, nutritional status, and risk of falls in pre-frail older women.

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METHOD: The protocol is for a randomized controlled clinical trial with a sample of pre-frail older women, divided into 5 groups: control group; PT using exergames; PS; PT using exergames combined with PS; PT using exergames combined with isoenergetic supplementation. The primary outcomes will be: the strength and power of the lower limbs, assessed by isokinetic dynamometer and the sit-and-stand test carried out 5 times; muscle architecture, assessed by ultrasound; body composition, assessed by anthropometric measurements, bioelectrical impedance and dual energy X-ray absorptiometry; and functional mobility and risk of falls, assessed using the Timed-Up and Go test. The secondary outcomes will be: centre of pressure (CoP), assessed using a force plate; and fear of falling, assessed using the Falls Efficacy Scale - International, Brazil. PT using exergames with a gradual increase in the mass weighted vest will be carried out twice a week for 50 min over 3 months. The supplements will be ingested 5 days a week for 3 months. All outcomes will be assessed before and after 3 months.

DISCUSSION: The WiiProtein study will be the first clinical trial to examine the effects of PT using exergames with progressive resistance, which may or may not be combined with PS, on MF, nutritional status, and risk of falls in pre-frail older women.

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Effects of using insoles of different thicknesses in older adults: which thickness has the best impact on postural stability and risk of falling?

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J. Am. Podiatr. Med. Assoc. 2018; ePub(ePub): ePub.

Affiliation: Institution of Health Sciences.

(Copyright © 2018, American Podiatric Medical Association)

DOI 10.7547/17-085 **PMID** 29668299

Abstract

BACKGROUND: Postural stability (PS) problems arise as an individual grows older, and as a result, risk of falling (RoF) increases in older adults. The purpose of this study was to examine the effects of insoles of various thicknesses on PS and RoF in older adults.

METHODS: Fifty-six individuals participated in the study. PS and RoF were evaluated both statically and dynamically using Biodex Balance System. PS and RoF assessments were performed under five different conditions: 1) barefoot, 2) only shoes, 3) with 5 mm insole, 4) with 10 mm insole, 5) with 15 mm insole. Standard shoes with identical features were used fitting the foot size of the individuals. In order to avoid time-dependent problems, these assessments were re-measured under the same conditions in 3 consecutive weeks. The average of these 3 values were recorded as the individuals' PS and RoF scores.

RESULTS: Insoles of different thicknesses significantly affected static PS [overall, $p:0.003$; medio-lateral (ML), $p:0.021$; antero-posterior (AP), $p:0.006$], static RoF (overall, $p:<0.001$; ML, $p:<0.001$; AP, $p:<0.001$), dynamic RoF (overall, $p:0.003$; ML, $p:0.042$; AP, $p:0.050$) and dynamic PS (overall, $p:0.034$; AP, $p:0.041$). However, thickness of the insoles did not have any impact on dynamic PS-ML ($p:0.071$). Amongst all measurements of static PS-overall, dynamic PS-AP, static RoF-overall, static RoF-ML, dynamic RoF-overall, dynamic RoF-ML, the highest PS scores and the lowest RoF were

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recorded in case of using 10 mm insole ($p < 0.05$).

CONCLUSIONS: The use of insoles with different thicknesses has been shown to be effective on all RoF and PS measurements (except for dynamic PS-ML). 10-mm-thick insole turned out to be a better option for elderly individuals to increase PS and reduce RoF compared the barefoot, only shoes, 5 and 15 mm insoles. For older adults, 10-mm-thick insoles made of medium-density plastozone may be recommended to help them with a better PS and a reduced RoF.

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Fall Prevention in Central Coast community pharmacies

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Health Promot. J. Austr. 2018; ePub(ePub): ePub.

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(Copyright © 2018, Australian Health Promotion Association, Publisher CAIRO Publishing)

DOI 10.1002/hpja.167 **PMID** 29675851

Abstract

ISSUE ADDRESSED: Fall injuries among people aged 65 years and over (older people) cause substantial health decline and cost to the health system. In 2009 in New South Wales 25.6% of older people fell in the previous year, and 10.7% (32,000) were hospitalised. Pharmacists are trusted professionals, who interact extensively with older people and have potential to augment fall prevention in pharmacies. This brief report describes how professional development improved pharmacist's knowledge and confidence in fall prevention, encouraged implementation of fall prevention plans, and facilitated provision of brief fall prevention interventions for older clients, after identification of fall risk.

METHODS: In 2014, pharmacists from all Central Coast pharmacies (n=76) were invited to free, continuing professional development (CPD) in fall prevention. It provided education and resources to identify clients' fall risk, conduct brief fall prevention interventions, and implement fall prevention health promotion plans (FPHPP). Pharmacists completed written: 1. Baseline and post workshop questionnaires to assess changes in pharmacist's knowledge and confidence, and existing fall prevention in pharmacies. 2. Logs of client fall risk, and brief fall prevention interventions offered to clients. 3. Four month follow-up questionnaires to assess implementation of FPHPPs and pharmacy practice changes.

RESULTS: Pharmacists representing 36% of pharmacies participated. At four months follow-up, 67% had implemented FPHPPs, and 62% delivered brief interventions determined by client fall risk.

CONCLUSIONS: Fall prevention in pharmacies can be augmented through locally provided CPD tailored for pharmacists. **SO WHAT:** This model could increase fall prevention reach. It is transferable to settings where health professionals provide services to older adults and require re-registration through professional development. This article is protected by copyright. All rights reserved.

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Falls in Mexican older adults aged 60 years and older

Valderrama-Hinds LM, Al Snih S, Chen NW, Rodriguez MA, Wong R.

Aging Clin. Exp. Res. 2018; ePub(ePub): ePub.

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(Copyright © 2018, Editrice Kurtis)

DOI 10.1007/s40520-018-0950-9 **PMID** 29667152

Abstract

BACKGROUND: Falls are a major cause of disability, morbidity, institutionalization, and mortality in older adults.

OBJECTIVES: The purpose of the study was to examine the risk factors for falls among Mexican older adults aged 60 years and older.

METHODS: This study included 6247 participants and their spouse or partner aged 60 years and older from the Mexican Health and Aging Study, an ongoing longitudinal study (2001-2012) conducted in Mexico. Measures included socio-demographics, falls, physical activity, comorbid conditions, pain, vertigo, vision and hearing impairments, urinary incontinence, lower extremity functional limitation, activities of daily living (ADLs), cognitive function, and depressive symptoms.

RESULTS: Mean age was 69.6 years (standard error = 0.18) and 51.8% were female. Forty percent reported one or more falls at baseline. Older age, being female, obesity, arthritis, fractures, stroke, suffering pain, vertigo, lower extremity functional limitations, physical activity, depressive symptoms, urinary incontinence, and ADL disability were significant factors associated with one or more falls over time.

DISCUSSION: Early detection and treatment of the risk factors for falls in this population will help improve the quality of life and reduce medical complications and health care costs.

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Hearing, self-motion perception, mobility, and aging

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Hear. Res. 2018; ePub(ePub): ePub.

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DOI 10.1016/j.heares.2018.03.025 **PMID** 29661612

Abstract

Hearing helps us know where we are relative to important events and objects in our environment and it allows us to track our changing position dynamically over space and time. Auditory cues are used in combination with other sensory inputs (visual, vestibular, proprioceptive) to help us perceive our own movements through space, known as self-motion perception. Whether we are maintaining standing balance, walking, or driving, audition can provide unique and important information to help optimize self-motion perception, and consequently to support safe mobility. Recent epidemiological and experimental studies have provided evidence that hearing loss is associated with greater walking difficulties, poorer overall physical functioning, and a significantly

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increased risk of falling in older adults. Importantly, the mechanisms underlying the associations between hearing status and mobility are poorly understood. It is also critical to consider that age-related hearing loss is often concomitant with declines in other sensory, motor, and cognitive functions and that these declines may interact, particularly during realistic, everyday tasks. Overall, exploring the role of auditory cues and the effects of hearing loss on self-motion perception specifically, and mobility more generally, are important to both building fundamental knowledge about the perceptual processes underlying the ability to perceive our movements through space, as well as to optimizing mobility-related interventions for those with hearing loss so that they can function better when confronted by everyday, real-world, sensory-motor challenges. The goal of this paper is to explore the role of hearing in self-motion perception across a range of mobility-related behaviors. First, we briefly review the ways in which auditory cues are used to perceive self-motion and how sound inputs affect behaviors such as standing balance, walking, and driving. Next, we consider age-related changes in auditory self-motion perception and the potential consequences to performance on mobility-related tasks. We then describe how hearing loss is associated with declines in mobility-related abilities and increased adverse outcomes such as falls. We describe age-related changes to other sensory and cognitive functions and how these may interact with hearing loss in ways that affect mobility. Finally, we briefly consider the implications of the hearing-mobility associations with respect to applied domains such as screening for mobility problems and falls risk in those with hearing loss and developing interventions and training approaches targeting safe and independent mobility throughout the lifespan.

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Impact of tailored falls prevention education for older adults at hospital discharge on engagement in falls prevention strategies postdischarge: protocol for a process evaluation

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BMJ Open 2018; 8(4): e020726.

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(Copyright © 2018, BMJ Publishing Group)

DOI 10.1136/bmjopen-2017-020726 **PMID** 29678985

Abstract

INTRODUCTION: Older adults recently discharged from hospital have greater incidence of adverse events, functional decline, falls and subsequent readmission. Providing education to hospitalised patients on how to prevent falls at home could reduce postdischarge falls. There has been limited research investigating how older adults respond to tailored falls prevention education provided at hospital discharge. The aim of this study is to evaluate how providing tailored falls prevention education to older patients at the point of, and immediately after hospital discharge in addition to usual care, affects engagement in falls prevention strategies in the 6-months postdischarge period, including their capability and motivation to engage in falls prevention strategies.

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METHODS AND ANALYSES: This prospective observational cohort study is a process evaluation of a randomised controlled trial, using an embedded mixed-method design. Participants (n=390) who have been enrolled in the trial are over the age of 60 years, scoring greater than 7/10 on the Abbreviated Mental Test Score. Participants are being discharged from hospital rehabilitation wards in Perth, Western Australia, and followed up for 6 months postdischarge. Primary outcome measures for the process evaluation are engagement in falls prevention strategies, including exercise, home modifications and receiving assistance with activities of daily living. Secondary outcomes will measure capability, motivation and opportunity to engage in falls prevention strategies, based on the constructs of the Capability Opportunity Motivation Behaviour system. Quantitative data are collected at baseline, then at 6 months postdischarge using structured phone interviews. Qualitative data are collected from a purposive sample of the cohort, using semistructured in-depth phone interviews. Quantitative data will be analysed using regression modelling and qualitative data will be analysed using interpretive phenomenological analysis. **ETHICS AND DISSEMINATION:** Results will be presented in peer-reviewed journals and at conferences worldwide. This study is approved by hospital and university Human Research Ethics Committees. © Article author(s) (or their employer(s) unless otherwise stated in the text of the article) 2018. All rights reserved. No commercial use is permitted unless otherwise expressly granted.

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Improved outcomes following implementation of a multidisciplinary care pathway for elderly hip fractures

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Aging Clin. Exp. Res. 2018; ePub(ePub): ePub.

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(Copyright © 2018, Editrice Kurtis)

DOI 10.1007/s40520-018-0952-7 **PMID** 29687304

Abstract

BACKGROUND: Hip fractures in patients 65 years and older are associated with significant morbidity and mortality. With the steady increase in the elderly population, we implemented an evidence-based clinical practice guideline for the management of hip fractures to optimize patient care and surgical outcomes.

AIMS: To evaluate the effects of a multidisciplinary hip fracture care pathway on patient outcomes in the care of elderly patients.

METHODS: A retrospective analysis of the differences in outcomes prior to (January-October 2014) and after (November 2014-April 2016) implementation of a hip fracture care pathway at a regional Level I trauma center was performed.

RESULTS: There were 80 patients in the pre-pathway group and 191 patients in the post-pathway group with an average age of 83.18 ± 8.24 years. The analysis demonstrated that the post-pathway group had a lower incidence of in-hospital complications (9.95 vs 30.00%; $p \leq 0.001$), shorter emergency room length of stay (3.76 ± 2.43 vs 6.78 ± 2.88 h; $p \leq 0.0001$), and shorter overall hospital length of stay (5.03 ± 3.46 vs 7.44 ± 6.66 days; $p = 0.0028$). The in-hospital mortality rate was similar

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between groups (4.71 vs 6.25%; $p = 0.6018$).

DISCUSSION: The development of a multidisciplinary approach to the care of elderly patients with hip fractures improved morbidity and showed a downward trend in mortality.

CONCLUSIONS: Elderly patients with hip fractures treated at our trauma center had improved clinical outcomes after the implementation of a multidisciplinary care pathway.

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Increased care demand and medical costs after falls in nursing homes: a Delphi study

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J. Clin. Nurs. 2018; ePub(ePub): ePub.

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Abstract

AIMS AND OBJECTIVE: To estimate the increased care demand and medical costs caused by falls in nursing homes.

BACKGROUND: There is compelling evidence that falls in nursing homes are preventable. However, proper implementation of evidence-based guidelines to prevent falls are often hindered by insufficient management support, staff time, and funding.

DESIGN: A three-round Delphi study.

METHODS: A panel of 41 experts, all working in nursing homes in the Netherlands, received three online questionnaires to estimate the extra hours of care needed during the first year after the fall. This was estimated for ten falls categories with different levels of injury severity, in three scenarios, i.e., a best-case, a typical-case, and a worst-case scenario. We calculated the costs of falls by multiplying the mean amount of extra hours that the participants spent on the care for a resident after a fall with their hourly wages.

RESULTS: In case of a non-injurious fall the extra time spent on the faller is on average almost 5 hours. Expressed in euros that adds to € 193. The extra staff time and costs of falls increased with increasing severity of injury. In the case of a fracture of the lower limb the extra staff time increased to 132 hours, expressed in euros that is € 4,604. In the worst-case scenario of a fracture of the lower limb, the extra staff time increased to 284 hours, expressed in euros that is € 10,170.

CONCLUSIONS: Falls in nursing homes result in a great deal of extra staff time spent on care, with extra costs varying between € 193 for a non-injurious fall and € 10,170 for serious falls. This article is protected by copyright. All rights reserved.

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Key issues to consider and innovative ideas on fall prevention in the geriatric department of a teaching hospital

Chan DK, Sherrington C, Naganathan V, Xu YH, Chen J, Ko A, Kneebone I, Cumming R.

Australas. J. Ageing 2018; ePub(ePub): ePub.

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(Copyright © 2018, Australian Council on the Ageing, Publisher John Wiley and Sons)

DOI 10.1111/ajag.12528 **PMID** 29679434

Abstract

Falls in hospital are common and up to 70% result in injury, leading to increased length of stay and accounting for 10% of patient safety-related deaths. Yet, high-quality evidence guiding best practice is lacking. Fall prevention strategies have worked in some trials but not in others. Differences in study setting (acute, subacute, rehabilitation) and sampling of patients (cognitively intact or impaired) may explain the difference in results. This article discusses these important issues and describes the strategies to prevent falls in the acute hospital setting we have studied, which engage the cognitively impaired who are more likely to fall. We have used video clips rather than verbal instruction to educate patients, and are optimistic that this approach may work. We have also explored the option of co-locating high fall risk patients in a close observation room for supervision, with promising results. Further studies, using larger sample sizes are required to confirm our findings.

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Long-term factors associated with falls and fractures poststroke

Foster EJ, Barlas RS, Bettencourt-Silva JH, Clark AB, Metcalf AK, Bowles KM, Potter JF, Myint PK. *Front. Neurol.* 2018; 9: e210.

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(Copyright © 2018, Frontiers Research Foundation)

DOI 10.3389/fneur.2018.00210 **PMID** 29666603 **PMCID** PMC5891595

Abstract

BACKGROUND: Risk factors for poststroke falls and fractures remain poorly understood. This study aimed to evaluate which factors increased risk of these events after stroke.

METHODS: Data from 7,267 hospitalized stroke patients were acquired from the Norfolk and Norwich University Hospital Stroke Register from 2003-2015. The impacts of multiple patient level and stroke characteristics and comorbidities on post-discharge falls and fractures were assessed. Univariate and multivariable models were constructed, adjusting for multiple confounders, using binary logistic regression for short-term analysis (up to 1-year post-discharge) and Cox-proportional hazard models for longer term analysis (1-3, 3-5, and 0-10 years follow-up).

RESULTS: The mean age (SD) was 76.3 ± 12.1 years at baseline. 1,138 (15.7%) participants had an incident fall; and 666 (9.2%) an incident fracture during the 10-year follow-up (total person years = 64,447.99 for falls and 67,726.70 for fractures). Half of the sample population were females (50.6%) and the majority had an ischemic stroke (89.8%). After adjusting for confounders: age, sex, previous history of falls, and atrial fibrillation were associated with an increased risk of both falls and fractures during follow-up. Furthermore, chronic kidney disease and hyperlipidemia were associated with an increased risk of falls, while previous stroke/transient ischemic attack increased fracture risk.

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Total anterior circulation stroke and a prestroke modified Rankin Scale score of 3-5 were associated with decreased risk of both events, with hypertension and cancer decreasing risk of falls only.

CONCLUSION: We identified demographic, stroke-related, and comorbid factors associated with poststroke falls and fracture incidence. Further studies are required to examine and establish the relationship between reversible factors and further explore the role of preventative measures to prevent poststroke falls and fractures.

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Movements of older adults during exergaming interventions that are associated with the Systems Framework for Postural Control: a systematic review

Tahmosybayat R, Baker K, Godfrey A, Caplan N, Barry G.

Maturitas 2018; 111: 90-99.

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DOI 10.1016/j.maturitas.2018.03.005 **PMID** 29673837

Abstract

One in three older adults fall annually, in part due to impairments in the physiological systems that make up the postural control (PC) system. Exercise, particularly balance training, helps to prevent deterioration and even to improve outcomes in the PC system. Exergaming (exercise-gaming) is interactive computer gaming whereby an individual moves the body in response to onscreen cues in a playful format. Exergaming is an alternative method to standard practice for improving PC outcomes, which has been shown to reduce the risk of falling. Exergaming has received research attention, yet the intervention is still in its infancy. There could be benefit in exploring the movements trained with respect to a framework known for identifying underlying deficits in the PC system, the Systems Framework for Postural Control (SFPC). This may help target areas for improvement in balance training using exergames and shed light on the impact for fall prevention. A literature search was therefore conducted across six databases (CINAHL, EMBASE, PubMed, ISI, SPORTdiscus and Science Direct) using a range of search terms and combinations relating to exergaming, balance, exercise, falls and elderly. Quality assessment was conducted using the PEDro Scale and a custom-made quality assessment tool. Movements were rated by two reviewers based on the 9 operational definitions of the SFPC. Eighteen publications were included in the analysis, with a mean PEDro score of 5.6 (1.5). Overall, 4.99 (1.27) of the 9 operational definitions of the SFPC are trained in exergaming interventions. Exergaming does encourage individuals to stand up (3), lean while standing (4), move upper limbs and turn heads (6) and dual-task while standing (9), to some extent move the body forwards, backwards and sideways (1), and coordinate movements (2) but hardly at all to kick, hop, jump or walk (7), or to force a postural reaction from a physical force to the individual (5) and it does not mimic actual changes in sensory context (8). This is the first review, to our knowledge, that synthesises the literature on movements trained in exergaming interventions with respect to an established theoretical framework for PC. This review could provide useful information for designing exergames with PC outcomes in mind, which could help target specific

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exergames for multi-factorial training to overcome balance deficits. Some elements of PC are too unsafe to be trained using exergames, such as restricting sensory inputs or applying physical perturbations to an individual to elicit postural responses.

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Physical activity and healthy ageing: a systematic review and meta-analysis of longitudinal cohort studies

Daskalopoulou C, Stubbs B, Kralj C, Koukounari A, Prince M, Prina AM.

Ageing Res. Rev. 2017; 38: 6-17.

(Copyright © 2017, Elsevier Publishing)

DOI 10.1016/j.arr.2017.06.003 **PMID** unavailable

Abstract

BACKGROUND: Older people constitute a significant proportion of the total population and their number is projected to increase by more than half by 2030. This increasing probability of late survival comes with considerable individual, economic and social impact. Physical activity (PA) can influence the ageing process but the specific relationship with healthy ageing (HA) is unclear. **METHODS:** We conducted a systematic review and meta-analysis of longitudinal studies examining the associations of PA with HA. Studies were identified from a systematic search across major electronic databases from inception as January 2017. Random-effect meta-analysis was performed to calculate a pooled effect size (ES) and 95% CIs. Studies were assessed for methodological quality. **RESULTS:** Overall, 23 studies were identified including 174,114 participants (30% men) with age ranges from 20 to 87 years old. There was considerable heterogeneity in the definition and measurement of HA and PA. Most of the identified studies reported a significant positive association of PA with HA, six reported a non-significant. Meta-analysis revealed that PA is positively associated with HA (ES: 1.39, 95% CI=1.23-1.57, n=17) even if adjusted for publication bias (ES: 1.27, 95% CI=1.11-1.45, n=20).

CONCLUSIONS: There is consistent evidence from longitudinal observational studies that PA is positively associated with HA, regardless of definition and measurement. Future research should focus on the implementation of a single metric of HA, on the use of objective measures for PA assessment and on a full-range of confounding adjustment. In addition, our research indicated the limited research on ageing in low-and-middle income countries.

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Preventing fractures and falls: a limited role for calcium and vitamin D supplements?

Bischoff-Ferrari HA, Bhasin S, Manson JE.

J. Am. Med. Assoc. JAMA 2018; 319(15): 1552-1553.

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(Copyright © 2018, American Medical Association)

DOI 10.1001/jama.2018.4023 **PMID** 29677284

Abstract

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Vitamin D and calcium are key nutrients to support bone development in children and young adults and to maintain muscle strength and neuromuscular coordination throughout the life span. Vitamin D deficiency is a well-defined risk factor for falls and hip fractures among older adults. It is unclear if supplementation with these nutrients is effective for the primary prevention of fractures among healthy community-dwelling adults.

In this issue of JAMA, the US Preventive Services Task Force (USPSTF) presents its recommendation statement on vitamin D and calcium supplementation to prevent fractures. These recommendations were based on a careful and comprehensive review of the evidence to determine whether supplements containing vitamin D or calcium individually or in combination contribute to the primary prevention of fractures among community-dwelling, asymptomatic adults without a diagnosis of osteoporosis or vitamin D deficiency. In a simultaneously published report, the USPSTF also presents its recommendation statement on interventions to prevent falls in older adults, based on a comprehensive review of the evidence regarding strategies for fall prevention among community-dwelling adults 65 years or older, extending from vitamin D to exercise and multifactorial interventions. Providing both guidelines in tandem is valuable, as the complementary articles reinforce the importance of fall prevention in reducing the risk of fractures (and other injuries) among older adults, who sustain 75% of all osteoporotic fractures.

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Recent opioid use and fall-related injury among older patients with trauma

Daoust R, Paquet J, Moore L, Emond M, Gosselin S, Lavigne G, Choinière M, Boulanger A, Mac-Thiong JM, Chauny JM.

CMAJ 2018; 190(16): e500-e506.

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(Copyright © 2018, Canadian Medical Association)

DOI 10.1503/cmaj.171286 **PMID** 29685910

Abstract

BACKGROUND: Evidence for an association between opioid use and risk of falls or fractures in older adults is inconsistent. We examine the association between recent opioid use and the risk, as well as the clinical outcomes, of fall-related injuries in a large trauma population of older adults.

METHODS: In a retrospective, observational, multicentre cohort study conducted on registry data, we included all patients aged 65 years and older who were admitted (hospital stay > 2 d) for injury in 57 trauma centres in the province of Quebec, Canada, between 2004 and 2014. We looked at opioid prescriptions filled in the 2 weeks preceding the trauma in patients who sustained a fall, compared with those who sustained an injury through another mechanism.

RESULTS: A total of 67 929 patients were retained for analysis. Mean age was 80.9 (\pm 8.0) years and 69% were women. The percentage of patients who had filled an opioid prescription in the 2 weeks preceding an injury was 4.9% (95% confidence interval [CI] 4.7%-5.1%) for patients who had had a fall, compared with 1.5% (95% CI 1.2%-1.8%) for those who had had an injury through another mechanism. After we controlled for confounding variables, patients who had filled an opioid prescription within 2 weeks before injury were 2.4 times more likely to have a fall rather than any

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other type of injury. For patients who had a fall-related injury, those who used opioids were at increased risk of in-hospital death (odds ratio 1.58; 95% CI 1.34-1.86).

INTERPRETATION: Recent opioid use is associated with an increased risk of fall and an increased likelihood of death in older adults.

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Resident-to-resident mistreatment: evaluation of a staff training program in the reduction of falls and injuries

Teresi JA, Ramirez M, Fulmer T, Ellis J, Silver S, Kong J, Eimicke JP, Boratgis G, Meador R, Lachs MS, Pillemer K.

J. Gerontol. Nurs. 2018; ePub(ePub): ePub.

(Copyright © 2018, Healio)

DOI 10.3928/00989134-20180326-01 PMID 29677382

Abstract

Resident-to-resident elder mistreatment (R-REM) occurs frequently in long-term services and support settings. The purpose of the current study was to evaluate the effect of a R-REM training program for nursing and other frontline staff on resident falls and injuries in a cluster randomized trial of units within four nursing homes. Interview and observational data from a sample of 1,201 residents (n = 600 and n = 601 in the usual care and intervention groups, respectively) and staff were collected at baseline and 6 and 12 months. A generalized linear model was used to model the falls/injuries outcome. The net reduction in falls and injuries was 5%, translating to 10 saved events per year in an average sized facility. Although the result did not reach statistical significance due to low power, the findings of fall prevention associated with implementing the intervention in long-term care facilities is clinically important.

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Sarcopenia is associated with cognitive impairment and depression in elderly Korean women

Lee I, Cho J, Hong H, Jin Y, Kim D, Kang H.

Iran. J. Public Health 2018; 47(3): 327-334.

(Copyright © 2018, Tehran University of Medical Sciences)

DOI unavailable PMID unavailable

Abstract

BACKGROUND: Sarcopenia has been implicated in the increased risk for cognitive impairment and depression associated with aging. In this cross-sectional study, we investigated the relationship of sarcopenia with cognitive impairment (MCI) and depression in a sample of 201 community-dwelling Korean women (mean age of 74.0±6.8 yr) between 2014 and 2015.

METHODS: The Korean version of mini-mental state examination and the center for epidemiologic studies depression scale was used to assess cognitive performance and depression, respectively. Grp strength was measured with a dynamometer. Demographics, body composition, education, alcohol consumption, and history of cardiovascular diseases were assessed as covariates.

RESULTS: Odds ratio (OR) and 95% confidence interval (95% CI) of MCI and depression were

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calculated according to sarcopenia status. Compared to non-sarcopenic, pre-sarcopenic and sarcopenic women had the ORs of 2.160 (95% CI of 0.840 - 5.554, P=0.030) and of 5.493 (95% CI of 1.854 - 16.270, P=0.002) for MCI. The OR of pre-sarcopenia for MCI remained significant (P=0.030) even after adjustments for age, body mass index (BMI), lean body mass, and education, while the OR of sarcopenia for MCI was no longer significant (P=0.084) when adjusted for the covariates. Compared to non-sarcopenic, pre-sarcopenic and sarcopenic women had the ORs of 3.750 (95% CI of 1.137 - 12.370, P=0.030) and of 4.687 (95% CI of 1.127 -19.505, P=0.034) for depression. The ORs of pre-sarcopenia and sarcopenia for depression remained statistically significant (P=0.020 and P=0.042, respectively) even after adjusted for the covariates Conclusion: Sarcopenia was significantly associated with MCI and depression in otherwise healthy community dwelling elderly Korean women.

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Self-perceived gait stability modulates the effect of daily life gait quality on prospective falls in older adults

Weijer RHA, Hoozemans MJM, Van Dieën JH, Pijnappels M.

Gait Posture 2018; 62: 475-479.

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DOI 10.1016/j.gaitpost.2018.04.002 **PMID** 29674287

Abstract

BACKGROUND: Quality of gait during daily life activities and perceived gait stability are both independent risk factors for future falls in older adults. **RESEARCH QUESTION:** We investigated whether perceived gait stability modulates the association between gait quality and falling in older adults.

METHODS: In this prospective cohort study, we used one-week daily-life trunk acceleration data of 272 adults over 65 years of age. Sample entropy (SE) of the 3D acceleration signals was calculated to quantify daily life gait quality. To quantify perceived gait stability, the level of concern about falling was assessed using the Falls Efficacy Scale international (FES-I) questionnaire and step length, estimated from the accelerometer data. A fall calendar was used to record fall incidence during a six-month follow up period. Logistic regression analyses were performed to study the association between falling and SE, step length or FES-I score, and their interactions.

RESULTS: High (i.e., poor) SE in vertical direction was significantly associated with falling. FES-I scores significantly modulated this association, whereas step length did not. Subgroup analyses based on FES-I scores showed that high SE in the vertical direction was a risk factor for falls only in older adults who had a high (i.e. poor) FES-I score. In conclusion, perceived gait stability modulates the association between gait quality and falls in older adults such that an association between gait quality and falling is only present when perceived gait stability is poor. **SIGNIFICANCE:** The results of the present study indicate that the effectiveness of interventions for fall prevention, aimed at improving gait quality, may be affected by a modulating effect of perceived gait stability.

RESULTS indicate that interventions to reduce falls in older adults might sort most effectiveness in

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populations with both a poor physiological and psychological status.

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Technology innovations for better fall risk management in home care

Koru G, Alhuwail D, Jademi O, Uchidiuno U, Rosati RJ.

J. Gerontol. Nurs. 2018; ePub(ePub): ePub.

(Copyright © 2018, Healio)

DOI 10.3928/00989134-20180412-01 **PMID** 29677381

Abstract

Achieving better fall risk management is an integral component of quality home care. The current qualitative study uncovers the challenges and opportunities of home health agencies (HHAs) in achieving better fall risk management. A secondary document analysis was adopted to learn from rich contextual information in fall incident reports recorded in a HHA. Poor engagement of patients and caregivers was a contributing factor in many fall incidents. Patients often fell as a result of not understanding or accepting their physical limitations. For better fall risk management, many incidents highlighted a need for providing complete and thorough care, better coordination of care, higher levels of sociocultural awareness, patient engagement, and caregiver involvement. The results provide evidence regarding the challenges and opportunities for improving fall risk management in home care along with insight about how information technology solutions can support improvement initiatives.

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The effect of tai chi exercise on the risk and fear of falling in older adults: a randomized clinical trial

Mortazavi H, Tabatabaeichehr M, Golestani A, Armat MR, Yousefi MR.

Mater. Sociomed. 2018; 30(1): 38-42.

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(Copyright © 2018, The author(s) or Association for Social Medicine- Public Health of Bosnia-Herzegovina, Publisher Avicena)

DOI 10.5455/msm.2018.30.38-42 **PMID** 29670476 **PMCID** PMC5857038

Abstract

BACKGROUND: Falling and fear of falling are among the most common problems of the elderly, which can cause illness, isolation, dependency and reduced quality of life in elderly. Exercise is recommended to prevent falling injuries in the elderly.

AIM: This study aimed to examine the effect of Tai Chi exercise on the risk and fear of falling in older adults.

MATERIALS AND METHODS: In this randomized clinical trial, a total of 60 male and female elderly were randomly divided into two groups: Tai Chi exercise and control (daily activities) groups. Tai Chi exercise protocol in the intervention group consisted of 3 sessions per week for 10 weeks. The risk

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and fear of falling were assessed in subjects by using standardized questionnaires, including Berg's Balance Scale and Fall Efficacy Scale-International (FES-I) before initiating the protocol, at the end of 4th, 8th weeks and at the end of exercise period.

RESULTS: Two groups were matched in terms of age, gender, education, and body mass index. Baseline values of risk of falling and fear of falling were not significantly different between the two groups ($P>0.05$). The score of fear of falling at the end of 4th, 8th weeks and at the end of exercise period was significantly different between the two groups ($P<0.05$) and it decreased in the intervention group, but the risk of falling reduced after 8 and 10 weeks in the intervention group ($P<0.001$).

CONCLUSION: Performing Tai Chi exercises for at least four weeks could reduce fear of falling and reduce the risk of falls in older adults after 8 weeks.

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Underreporting of fall injuries of older adults: implications for wellness visit fall risk screening

Hoffman GJ, Ha J, Alexander NB, Langa KM, Tinetti M, Min LC.

J. Am. Geriatr. Soc. 2018; ePub(ePub): ePub.

Affiliation: Institute for Social Research, University of Michigan, Ann Arbor, Michigan.

(Copyright © 2018, John Wiley and Sons)

DOI 10.1111/jgs.15360 **PMID** 29665016

Abstract

OBJECTIVES: To compare the accuracy of and factors affecting the accuracy of self-reported fall-related injuries (SFRIs) with those of administratively obtained FRIs (AFRIs).

DESIGN: Retrospective observational study

SETTING: United States

PARTICIPANTS: Fee-for-service Medicare beneficiaries aged 65 and older (N=47,215).

MEASUREMENTS: We used 24-month self-report recall data from 2000-2012 Health and Retirement Study data to identify SFRIs and linked inpatient, outpatient, and ambulatory Medicare data to identify AFRIs. Sensitivity and specificity were assessed, with AFRIs defined using the University of California at Los Angeles/RAND algorithm as the criterion standard. Logistic regression models were used to identify sociodemographic and health predictors of sensitivity.

RESULTS: Overall sensitivity and specificity were 28% and 92%. Sensitivity was greater for the oldest adults (38%), women (34%), those with more functional limitations (47%), and those with a prior fall (38%). In adjusted results, several participant factors (being female, being white, poor functional status, depression, prior falls) were modestly associated with better sensitivity and specificity. Injury severity (requiring hospital care) most substantively improved SFRI sensitivity (73%).

CONCLUSION: An overwhelming 72% of individuals who received Medicare-reimbursed health care for FRIs failed to report a fall injury when asked. Future efforts to address underreporting in primary care of nonwhite and healthier older adults are critical to improve preventive efforts. Redesigned questions-for example, that address stigma of attributing injury to falling-may improve sensitivity.

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Visually fixating or tracking another person decreases balance control in young and older females walking in a real-world scenario

Thomas NM, Donovan T, Dewhurst S, Bampouras TM.

Neurosci. Lett. 2018; ePub(ePub): ePub.

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(Copyright © 2018, Elsevier Publishing)

DOI 10.1016/j.neulet.2018.04.038 **PMID** 29689345

Abstract

Balance control during overground walking was assessed in 10 young (23.6 ± 3.4) and 10 older (71.0 ± 5.5 years) healthy females during free gaze, and when fixating or tracking another person in an everyday use waiting room. Balance control was characterised by medial/lateral sacrum acceleration dispersion, and gaze fixations were simultaneously assessed with eye tracking equipment. The results showed decreased balance control when fixating a stationary ($p = 0.003$, $g_{av} = 0.19$) and tracking a walking ($p = 0.027$, $g_{av} = 0.16$) person compared to free gaze. The older adults exhibited reduced baseline stability throughout, but the decrease caused by the visual tasks were not more profound than the younger adults. The decreased balance control when fixating on or tracking the observed person was likely due to more challenging conditions for interpreting retinal flow, which facilitated less reliable estimates of self-motion through vision. The older adults either processed retinal flow during the tasks as effectively as the young adults, or they adopted a more rigid posture to facilitate visual stability, which masked any ageing effect of the visual tasks. The decrease in balance control, the first to be shown in this context, may warrant further investigation in those with ocular or vestibular dysfunction.

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Does cerebellar overactivity contribute to gait and balance deficits in Parkinson's disease?

Lefaiivre SC, Brown MJN, Almeida QJ.

Mov. Disord. 2018; ePub(ePub): ePub.

Affiliation: Movement Disorders Research and Rehabilitation Centre, Wilfrid Laurier University, Waterloo, Ontario, Canada.

(Copyright © 2018, Movement Disorders Society, Publisher John Wiley and Sons)

DOI 10.1002/mds.27396 **PMID** 29676478

Abstract [Abstract unavailable]

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One-year and three-year mortality prediction in adult major blunt trauma survivors: a National Retrospective Cohort Analysis

Wong TH, Nadkarni NV, Nguyen HV, Lim GH, Matchar DB, Seow DCC, King NKK, Ong MEH.

Scand. J. Trauma Resusc. Emerg. Med. 2018; 26(1): 28.

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DOI 10.1186/s13049-018-0497-y **PMID** 29669572

Abstract

BACKGROUND: Survivors of trauma are at increased risk of dying after discharge. Studies have found that age, head injury, injury severity, falls and co-morbidities predict long-term mortality. The objective of our study was to build a nomogram predictor of 1-year and 3-year mortality for major blunt trauma adult survivors of the index hospitalization.

METHODS: Using data from the Singapore National Trauma Registry, 2011-2013, we analyzed adults aged 18 and over, admitted after blunt injury, with an injury severity score (ISS) of 12 or more, who survived the index hospitalization, linked to death registry data. The study population was randomly divided 60/40 into separate construction and validation datasets, with the model built in the construction dataset, then tested in the validation dataset. Multivariable logistic regression was used to analyze 1-year and 3-year mortality.

RESULTS: Of the 3414 blunt trauma survivors, 247 (7.2%) died within 1 year, and 551 (16.1%) died within 3 years of injury. Age (OR 1.06, 95% CI 1.05-1.07, $p < 0.001$), male gender (OR 1.53, 95% CI 1.12-2.10, $p < 0.01$), low fall from 0.5 m or less (OR 3.48, 95% CI 2.06-5.87, $p < 0.001$), Charlson comorbidity index of 2 or more (OR 2.26, 95% CI 1.38-3.70, $p < 0.01$), diabetes (OR 1.31, 95% CI 1.68-2.52, $p = 0.04$), cancer (OR 1.76, 95% CI 0.94-3.32, $p = 0.08$), head and neck AIS 3 or more (OR 1.79, 95% CI 1.13-2.84, $p = 0.01$), length of hospitalization of 30 days or more (OR 1.99, 95% CI 1.02-3.86, $p = 0.04$) were predictors of 1-year mortality. This model had a c-statistic of 0.85. Similar factors were found significant for the model predictor of 3-year mortality, which had a c-statistic of 0.83. Both models were validated on the second dataset, with an overall accuracy of 0.94 and 0.84 for 1-year and 3-year mortality respectively.

CONCLUSIONS: Adult survivors of major blunt trauma can be risk-stratified at discharge for long-term support.

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Reducing complications and overall healthcare costs of hip fracture management: a retrospective study on the application of a Diagnostic Therapeutic Pathway in the Cosenza General Hospital

Loizzo M, Gallo F, Caruso D.

Ann. Ig. 2018; 30(3): 191-199.

Affiliation: Operative Orthopaedics Unit, Cosenza General Hospital, Cosenza, Italy.

(Copyright © 2018, Societa Editrice Universo)

DOI unavailable **PMID** 29670988

Abstract

BACKGROUND: Diagnostic Therapeutic Pathways (DTPs) are multidisciplinary plans designed by each healthcare organization for a specific category of patients to reduce the variability of professional behaviors and to ensure greater safety and better overall healthcare outcomes. Hip fractures are a frequent traumatic injury, particularly in the elderly, and DTPs recommend early surgical intervention, often not done due to organizational challenges and bureaucracy. Medical conditions suggesting a delay are not frequent, however long waiting times not only increase the risk of

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complications and mortality, but also increase the number of diagnostic test and physician consultations. This study tried to understand the benefits of performing surgical intervention within 48 hours in terms of cost savings, reduction of complications and better overall outcomes. We performed statistical analyses on data gathered from 130 patients submitted to DTPs, and we evaluated the benefits obtained by operating within 48 hours in terms of resource saving (number of physician consultations, hospitalization days, etc.), reduction in complications reported in the literature.

METHODS: About 40% of clinical records of femoral fractures from 2015 at the Cosenza General Hospital were used in our statistical analysis taking into account independent variables such as age, sex, surgery waiting times and ASA (e.g. American Society of Anesthesiologists) score. Additionally, dependent variables such as: the type of complications during the hospital stay (e.g. infections, delirium, etc), days of hospitalization, and number of physician consultations were considered.

RESULTS: The average waiting time for surgical intervention was 5.48 days (132 hr). Patients with ASA score of 4 had a greater chance of complications (p-value 0.03), whereas patients operated within 48 hours avoided complications, and spent fewer days in the hospital. The ASA score value correlated positively with the number of physician consultation, as the ASA score increased in number, so did the number of physician consultations. Moreover, each additional day of waiting increased the possibility of physician consultation by approximately 13.

CONCLUSION: The lack of available hospital beds and staff shortages are the main reasons for the delay in performing surgery, this situation does not allow an efficient treatment and timely release of patients from the healthcare system. Therefore, there is an important need to implement standardized orthopedic and geriatric pathways (DTPs), inspired by the collaboration between healthcare system management, orthopedic and geriatric specialists, and physical therapists, to drive shorter days of hospitalization and better overall patient health outcome by performing surgery as soon as possible.

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