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"Staying safe" - a narrative review of falls prevention in people with Parkinson's - "PDSAFE"

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DOI 10.1080/09638288.2018.1471167 **PMID** 29774765

Abstract

BACKGROUND: Parkinson's disease demonstrates a spectrum of motor and non-motor symptoms. Falling is common and disabling. Current medical management shows minimal impact to reduce falls or fall-related risk factors, such as deficits in gait, strength, and postural instability. Despite evidence supporting rehabilitation in reducing fall risk factors, the most appropriate intervention to reduce overall fall rate remains inconclusive. This article aims to 1) synthesise current evidence and conceptual models of falls rehabilitation in Parkinson's in a narrative review; and based on this evidence, 2) introduce the treatment protocol used in the falls prevention and multi-centre clinical trial "PDSAFE".

METHOD: Search of four bibliographic databases using the terms "Parkinson*" and "Fall*" combined with each of the following; "Rehab*", "Balanc*", "Strength*", "Strateg*" and "Exercis*" and a framework for narrative review was followed. A total of 3557 papers were identified, 416 were selected for review. The majority report the impact of rehabilitation on isolated fall risk factors. Twelve directly measure the impact on overall fall rate.

DISCUSSION: Results were used to construct a narrative review with conceptual discussion based on the "International Classification of Functioning", leading to presentation of the "PDSAFE" intervention protocol.

CONCLUSIONS: Evidence suggests training single, fall risk factors may not affect overall fall rate. Combining with behavioural and strategy training in a functional, personalised multi-dimensional model, addressing all components of the "International Classification of Functioning" is likely to provide a greater influence on falls reduction. "PDSAFE" is a multi-dimensional, physiotherapist delivered, individually tailored, progressive, home-based programme. It is designed with a strong evidence-based approach and illustrates a model for the clinical delivery of the conceptual theory discussed. Implications for Rehabilitation Parkinson's disease demonstrates a spectrum of motor and non-motor symptoms, where falling is common and disabling. Current medical and surgical management have minimal impact on falls, rehabilitation of falls risk factors has strong evidence but the most appropriate intervention to reduce overall fall rate remains inconclusive. Addressing all components of the International Classification of Function in a multifactorial model when designing falls rehabilitation interventions may be more effective at reducing fall rates in people with Parkinson's than treating isolated risk factors. The clinical model for falls rehabilitation in people with Parkinson's should be multi-dimensional.

PDF Y Endnote Y

Association of fall history with the Timed Up and Go test score and the dual task cost: a cross-sectional study among independent community-dwelling older adults

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Abstract

AIM: To investigate the associations between fall history and the Timed Up and Go (TUG) test (single-TUG test), TUG test while counting aloud backwards from 100 (dual-TUG test) and the dual-task cost (DTC) among independent community-dwelling older adults.

METHODS: This cross-sectional study included 537 older adults who lived independently in the community. Data on fall history in the previous year were obtained by self-administrated questionnaire. The single- and dual-TUG tests were carried out, and the DTC value was computed from these results. Associations between fall history and these TUG-related values were analyzed using multivariate logistic regression models. The participants were divided into fall risk groups using the cut-off values of those significantly associated with falling, and the odds ratios (OR) were computed.

RESULTS: Slower single-TUG test scores and lower DTC values were significantly associated with fall history after adjusting for potential confounders (single-TUG test score: OR 1.133, 95% CI 1.029-1.249; DTC value: OR 0.984, 95% CI 0.968-0.998). Older adults with slower single-TUG test scores and lower DTC values reported a fall history more often than those in other categories (OR compared with the lower-risk single-TUG and lower-risk DTC groups: 3.474, 95% CI 1.881-6.570).

CONCLUSIONS: Slower single-TUG test scores and lower DTC values are associated with fall history among independent community-dwelling older adults. To some extent, dual task performance might provide added value for fall assessment, compared with administering the TUG test alone.

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PDF Y Endnote Y

Benefits of a multicomponent falls unit-based exercise program in older adults with falls in real life

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Abstract

BACKGROUND/OBJECTIVES: Multicomponent exercise programs are the cornerstone in preventing gait and balance impairments and falls in older adults. However, the effects of these programs in

usual clinical practice have been poorly analyzed.

DESIGN: 4-Month, twice-a-week multicomponent exercise program cohort study in real-life.

SETTING: Falls Unit, Complejo Hospitalario Universitario of Albacete, Spain. **PARTICIPANTS:** Sixty-seven participants who had experienced a fall in the previous year were included. **MEASUREMENTS:** Pre- and post-intervention measurements were collected for leg press, gait speed, the Short Physical Performance Battery (SPPB), the Falls Efficiency Scale International, fat mass percentage, body mass index, the Geriatric Depression Scale by Yesavage (GDS), the Mini Mental State Examination, and the number of falls.

RESULTS: Fifty participants completed the program (adherence rate 75%, attendance 80%). Their mean age was 77.2 (SD 5.8) years; 39 were women. The participants reduced the mean number of frailty criteria from 2.1 to 1.3 (95%CI 0.4-1.1) and increased mean gait speed from 0.65 m/s to 0.82 m/s (95%CI 0.11-0.22), increasing their median SPPB scores from 8.5 to 10.0 points ($p < 0.001$), leg press strength from 62.5 kg to 80.0 kg ($p < 0.001$), and leg press power at 60% load from 76 W to 119 W ($p < 0.001$). There was also an improvement in GDS scores from 5.3 to 4.4 (95%CI 0.1-1.7). Body mass index did not change, but fat-free mass increased from 43.7 kg to 44.2 kg (95%CI 0.1-1.0), and fat mass percentage declined from 36.7% to 36.0% (95% CI 0.1-1.4). Seventeen patients (34%) had a fall during the six-month follow-up, and there was a reduction in the median number of falls from 3.0/year to 0.0/six months.

CONCLUSIONS: A multicomponent Falls Unit-based exercise program as part of usual clinical practice in real life, improved physical function, reduced depressive symptoms, improved body composition and decreased the number of falls in older adults with previous falls.

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PDF Y Endnote Y

Clinicopathological characteristics of traumatic head injury in juvenile, middle-aged and elderly individuals

Wang J, Han F, Zhao Q, Xia B, Dai J, Wang Q, Huang S, Le C, Li Z, Liu J, Yang M, Wan C, Wang J. *Med. Sci. Monit.* 2018; 24: 3256-3264.

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Abstract

BACKGROUND Traumatic head injury is a leading cause of death and disability worldwide. How clinicopathological features differ by age remains unclear. This epidemiological study analyzed the clinicopathological features of patients with head injury belonging to 3 age groups. **MATERIAL AND METHODS** Data of patients with traumatic head injury were obtained from the Department of Cerebral Surgery of the Affiliated Hospital of Guizhou Medical University and the Guizhou Provincial People's Hospital in 2011-2015. Their clinicopathological parameters were assessed. The patients were divided into 3 age groups: elderly (≥ 65 years), middle-aged (18-64 years), and juvenile (≤ 17 years) individuals.

RESULTS Among 3356 hospitalizations for traumatic head injury (2573 males and 783 females, 654

died (19.49%), the highest and lowest mortality rates were in the elderly and juvenile groups, respectively. Fall was the most common cause in juvenile and elderly individuals (32.79% and 43.95%, respectively), while traffic injury was most common in the elderly group (35.08%). The manners of injury differed considerably among the 3 age groups. Scalp injury, skull fracture, intracranial hematoma, and cerebral injury were the most common mechanisms in juvenile (67.32%), middle-aged (63.50%), elderly (69.56%) and middle-aged (90.44%) individuals, respectively. Scalp injury and skull fracture types differed among the groups. Epidural, subdural, and intracerebral hematomas were most common in juvenile, middle-aged, and elderly individuals, respectively. Cerebral contusion showed the highest frequency in the 3 groups, and concussion the lowest.

CONCLUSIONS Patients with traumatic HI show remarkable differences in clinicopathological features among juvenile, middle-aged, and elderly individuals.

PDF Y Endnote Y

Correction: Fear of falling in community-dwelling older adults: a cause of falls, a consequence, or both?

Lavedán A, Viladrosa M, Jürschik P, Botigué T, Nuín C, Masot O, Lavedán R.

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Abstract [This corrects the article DOI: 10.1371/journal.pone.0194967].

PDF Y Endnote Y

Deep learning to predict falls in older adults based on daily-life trunk accelerometry

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Sensors (Basel) 2018; 18(5): s18051654.

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Abstract

Early detection of high fall risk is an essential component of fall prevention in older adults. Wearable sensors can provide valuable insight into daily-life activities; biomechanical features extracted from such inertial data have been shown to be of added value for the assessment of fall risk. Body-worn sensors such as accelerometers can provide valuable insight into fall risk. Currently, biomechanical features derived from accelerometer data are used for the assessment of fall risk. Here, we studied whether deep learning methods from machine learning are suited to automatically derive features from raw accelerometer data that assess fall risk. We used an existing dataset of 296 older adults. We compared the performance of three deep learning model architectures (convolutional neural network (CNN), long short-term memory (LSTM) and a combination of these two (ConvLSTM)) to each other and to a baseline model with biomechanical features on the same dataset. The results show that the deep learning models in a single-task learning mode are strong in recognition of

identity of the subject, but that these models only slightly outperform the baseline method on fall risk assessment. When using multi-task learning, with gender and age as auxiliary tasks, deep learning models perform better. We also found that preprocessing of the data resulted in the best performance (AUC = 0.75). We conclude that deep learning models, and in particular multi-task learning, effectively assess fall risk on the basis of wearable sensor data.

PDF Y Endnote Y

Dizziness and (fear of) falling in the elderly: a few facts

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J. Int. Adv. Otol. 2018; 14(1): 1-2.

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Abstract [Abstract unavailable]

PDF Y Endnote Y

Effect of a balance-training programme on postural balance, aerobic capacity and frequency of falls in women with osteoporosis: a randomized controlled trial

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DOI 10.2340/16501977-2349 **PMID** 29767227

Abstract

OBJECTIVE: To investigate the effect of a 12-month complex balance-training programme on static and dynamic postural balance, aerobic capacity and frequency of falls in women with established osteoporosis.

DESIGN: Randomized controlled trial in which the intervention group was assigned a 12-month exercise programme (3 times a week for 30 min) and the control group had no intervention.

SUBJECTS: A total of 100 osteoporotic women with at least one previous fracture.

METHODS: Performance-based Timed Up and Go (TUG), Berg Balance Scale (BBS) and stabilometric platform tests were used to evaluate balance. Aerobic capacity was measured by bicycle ergometry. Frequency of falls was assessed using a falls diary.

RESULTS: After 1 year, there was a statistically significant difference between the improvement achieved in the intervention and control groups on the performance-based TUG, BBS and stabilometric platform tests ($p < 0.05$). Mean metabolic equivalent (MET) value decreased in the intervention group, from 4.91 to 3.82 (a significant difference from the change achieved in the control group; $p = 0.05$). Relative risk of falls was 0.534 at 1 year ($p = 0.17$).

CONCLUSION: The 12-month balance-training programme significantly improved postural balance and increased aerobic capacity in women with established osteoporosis.

PDF Y Endnote Y**Effect of balance training on the falling in osteoporosis patients: a systematic review and meta-analysis**

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J. Rehabil. Med. 2018; ePub(ePub): ePub.

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(Copyright © 2018, Foundation for Rehabilitation Information)

DOI 10.2340/16501977-2334 **PMID** 29767225

Abstract

BACKGROUND: Balance training may be beneficial for patients with osteoporosis, although current results are inconclusive. The aim of this systematic review and meta-analysis was to explore the effect of balance training on falls in patients with osteoporosis.

METHODS: PubMed, Embase, Web of Science, EBSCO, and Cochrane Library databases were systematically searched. Randomized controlled trials (RCTs) assessing the effect of balance training vs usual activities on falls in patients with osteoporosis were included. Two investigators independently searched articles, extracted data, and assessed the quality of included studies. The primary outcome was fall frequency. This meta-analysis was performed using the fixed- or random-effect model when appropriate.

RESULTS: Six RCTs were included in the systematic review and 3 in the meta-analyses. Compared with control groups, a balance training intervention was found to significantly reduce the frequency of falls (risk ratio = 0.63; 95% confidence interval (95% CI) 0.42-0.95; $p = 0.03$) in patients with osteoporosis, but demonstrated no remarkable influence on the results of the Berg Balance Scale (mean difference -3.66; 95% CI -12.04-4.72; $p = 0.39$) and Timed Up and Go test (mean difference -1.79; 95% CI -6.05-2.47; $p = 0.41$).

CONCLUSION: Balance training may significantly reduce the frequency of falls in patients with osteoporosis.

PDF Y Endnote Y**Effects of gait training with auditory feedback on walking and balancing ability in adults after hemiplegic stroke: a preliminary, randomized, controlled study**

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Int. J. Rehabil. Res. 2018; ePub(ePub): ePub.

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Abstract

The aim of this study was to identify a gait training type that better improves the walking and balancing abilities of adult patients with chronic hemiplegic stroke. Single-blinded, randomized, controlled, comparative preliminary study was carried out. Patients were recruited from the

inpatient unit of a Rehabilitation Hospital. Thirty-one patients who had experienced hemiplegic stroke were randomly assigned to three groups: the heel group (gait training by active weight bearing on the paretic heel with auditory feedback), the forefoot group (gait training with auditory feedback from paretic metatarsals), and the control group (general gait intervention). All patients performed 30 min of comprehensive rehabilitation therapy followed by an additional 20 min of gait intervention with or without auditory feedback three times a week for 6 weeks. Significant improvements in walking and balancing variables were observed after gait training in all three groups ($P < 0.05$). However, significantly larger gains were identified in the heel group than in the control group (center of loading path length, -29.4 vs. -11.4%, $d = -1.0$; center of loading path velocity, -35.8 vs. -19.6%, $d = -1.4$). In addition, significantly larger gains were observed in the forefoot group than in the control group (functional gait assessment, +42.6 vs. +20.1%, $d = 1.3$; center of loading path length, -37.2 vs. -11.4%, $d = -1.8$; center of loading path velocity, -36.0 vs. -19.6%, $d = -1.3$). Auditory feedback during active weight bearing on paretic feet appears to more effectively improve the walking and balancing abilities of hemiplegic stroke patients than general gait training.

PDF N Endnote Y

Falls and recurrent falls among adults in a multi-ethnic Asian population: the Singapore Epidemiology of Eye Diseases Study

Dai W, Tham YC, Chee ML, Tan NYQ, Wong KH, Majithia S, Sabanayagam C, Lamoureux E, Wong TY, Cheng CY.

Sci. Rep. 2018; 8(1): e7575.

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(Copyright © 2018, Nature Publishing Group)

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Abstract

We evaluated the rate and risk factors associated with falls and recurrent falls in a multi-ethnic Asian population. 10,009 participants aged ≥ 40 years (mean[SD] age = 58.9[10.4] years) underwent clinical examinations and completed interviewer-administered questionnaires. Participants who self-reported at least one fall or ≥ 2 falls in past 12 months were defined as fallers and recurrent fallers, respectively. Age-standardized rates for falls and recurrent falls were 13.8% (95%CI, 13.1-14.6%) and 4.6% (95%CI, 4.2-5.1%), respectively. Multivariable analyses showed older age (OR = 1.20; 95%CI, 1.11-1.30), female gender (OR = 1.79; 95%CI, 1.54-2.07), diabetes (OR = 1.22; 95%CI, 1.07-1.40), cardiovascular disease (CVD, OR = 1.37; 95%CI, 1.14-1.65), ≥ 3 systemic comorbidities (OR = 1.35; 95%CI, 1.09-1.67), lower European Quality of Life-5 Dimensions (EQ-5D) score (OR = 1.36; 95%CI, 1.29-1.44), alcohol consumption (OR = 1.41, 95%CI, 1.11-1.78) and presenting visual impairment (VI, OR = 1.23; 95%CI, 1.02-1.47) were associated with falls. For recurrent falls, female gender (OR = 2.27; 95%CI, 1.75-2.94), diabetes (OR = 1.28; 95%CI, 1.03-1.61), CVD (OR = 2.00; 95%CI, 1.53-2.62), ≥ 3 systemic comorbidities (OR = 1.69; 95%CI, 1.19-2.39), lower EQ-5D score (OR = 1.47; 95%CI, 1.35-1.59), living in 1-2 room public flat (OR = 1.57; 95%CI, 1.05-2.33), monthly income < 2000 Singapore Dollar (OR = 1.62; 95%CI, 1.13-2.31), alcohol consumption (OR = 1.81, 95%CI, 1.23-2.66) and

presenting VI (OR = 1.34; 95%CI, 1.01-1.79) were significant risk factors. These findings will be useful for the formulation of fall prevention programs.

PDF Y Endnote Y

Health professional student education related to the prevention of falls in older people: a survey of universities in Australia and New Zealand

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

Affiliation: University of New South Wales, Sydney, New South Wales, Australia.
(Copyright © 2018, Australian Council on the Ageing, Publisher John Wiley and Sons)

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Abstract

OBJECTIVE: To determine the amount and nature of health professional education related to fall prevention for older adults in Australian and New Zealand universities.

METHODS: Universities offering medicine, nursing and allied health courses were invited to complete an online survey enquiring about fall prevention course-related information: topics; delivery mode; and time dedicated.

RESULTS: One hundred and five respondents, 11 disciplines and 43 universities completed the survey. Courses were primarily undergraduate level (90%) and delivered face-to-face (93%). Time dedicated to fall prevention was usually one to three hours of lectures (>65% of courses) and 1-3+ hours of tutorials/practical sessions (>80% of courses).

CONCLUSIONS: Survey results indicate that education of health professionals across a range of disciplines in Australia and New Zealand does include older adult fall prevention. Education of all health and exercise professionals about falls is vital given their critical role in the prevention and management of falls in our rapidly ageing population.

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PDF Y Endnote Y

Impact of a safe resident handling program in nursing homes on return-to-work and re-injury outcomes following work injury

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J. Occup. Rehabil. 2018; ePub(ePub): ePub.

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(Copyright © 2018, Holtzbrinck Springer Nature Publishing Group)

DOI 10.1007/s10926-018-9785-7 **PMID** 29785467

Abstract

PURPOSE This study examined the impact of a Safe Resident Handling Program (SRHP) on length of disability and re-injury, following work-related injuries of nursing home workers. Resident handling-related injuries and back injuries were of particular interest.

METHODS A large national nursing home corporation introduced a SRHP followed by three years of training for 136 centers. Lost-time workers' compensation claims (3 years pre-SRHP and 6 years

post-SRHP) were evaluated. For each claim, length of first episode of disability and recurrence of disabling injury were evaluated over time. Differences were assessed using Chi square analyses and a generalized linear model, and "avoided" costs were projected.

RESULTS The SRHP had no impact on length of disability, but did appear to significantly reduce the rate of recurrence among resident handling-related injuries. As indemnity and medical costs were three times higher for claimants with recurrent disabling injuries, the SRHP resulted in significant "avoided" costs due to "avoided" recurrence.

CONCLUSIONS In addition to reducing overall injury rates, SRHPs appear to improve long-term return-to-work success by reducing the rate of recurrent disabling injuries resulting in work disability. In this study, the impact was sustained over years, even after a formal training and implementation program ended. Since back pain is inherently a recurrent condition, results suggest that SRHPs help workers remain at work and return-to-work.

PDF Y Endnote Y

Improving life expectancy: a 'broken neck' doesn't have to be a terminal diagnosis for the elderly

Godat LN, Kobayashi LM, Chang DC, Coimbra R.

Trauma Surg. Acute Care Open 2018; 3(1): e000174.

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DOI 10.1136/tsaco-2018-000174 **PMID** 29766142 **PMCID** PMC5887759

Abstract

BACKGROUND: Elderly patients with cervical spine fractures require optimal care. Treatment with a cervical collar or halo instead of surgical fixation may increase mortality. This investigation intends to describe the life expectancy after injury and evaluate the impact of surgical intervention on mortality.

METHODS: Patients ≥ 65 years, with traumatic cervical spine fractures without cord injury were identified in the 1995-2009 California Office of Statewide Health and Planning database. Those with halo placement or surgical spine fixation were identified. Primary outcome was death, studied at the initial admission, 30 days, 1 year, and the entire study period. Univariate and multivariate regressions were performed to identify predictors of death. Kaplan-Meier survival curves were used to describe life expectancy after injury.

RESULTS: 10 938 patients were identified. Mortality rate was 10% during the initial admission, 28% at 1 year and 50% during the entire study period. A halo was placed in 14% of patients and 12% underwent surgical fixation. Mortality rates during the initial admission were 11% for patients without an intervention, 7% with halo placement and 6% with surgical fixation; at 1 year, these increased to 30%, 26% and 19%, respectively. At 1 year, more than one in four patients above 75 years of age will die. At 1 year spine fixation, female gender and admission to a trauma center predicted a lower risk of death at 1 year (OR 0.59, 0.68; $p < 0.001$ and OR 0.89; $p = 0.02$, respectively). Having a complication, fall mechanism, and traumatic brain injury (OR 1.84, 1.33, 1.37; $p < 0.001$, respectively) were predictors of a higher risk of death. Halo use had no impact on

death at 1 year (OR 0.98; p=0.77).

DISCUSSION: Mortality rates after cervical spine fracture in the elderly is high. Surgical fixation is associated with improved survival; remaining true after adjusting for age and comorbidities; suggesting that surgical fixation may improve outcomes in the elderly. LEVEL OF EVIDENCE: Level IV.

PDF Y Endnote Y

Increased trauma activation is not equally beneficial for all elderly trauma patients

Carr BW, Hammer PM, Timsina L, Rozycki G, Feliciano DV, Coleman JJ.

J. Trauma Acute Care Surg. 2018; ePub(ePub): ePub.

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(Copyright © 2018, Lippincott Williams and Wilkins)

DOI 10.1097/TA.0000000000001986 **PMID** 29787528

Abstract

BACKGROUND: Physiologic changes in the elderly lead to higher morbidity and mortality after injury. Increasing level of trauma activation has been proposed to improve geriatric outcomes; but, the increased cost to the patient and stress to the hospital system are significant downsides. The purpose of this study was to identify the age at which an increase in activation status is beneficial.

METHODS: A retrospective review of trauma patients ≥ 70 years old from October 1, 2011, to October 1, 2016 was performed. On October 1, 2013, a policy change increased the activation criteria to the highest level for patients ≥ 70 years of age with a significant mechanism of injury. Patients who presented prior to (PRE) were compared to those after the change (POST). Data collected included age, injury severity score (ISS), length of stay (LOS), complications and mortality. Primary outcome was mortality and secondary outcome was LOS. Multivariable regressions controlled for age, ISS, injury mechanism, and number of complications.

RESULTS: 4341 patients met inclusion criteria, 1919 in PRE and 2422 in POST. Mean age was 80.4 and 81 years in PRE and POST groups respectively (p=0.0155). Mean ISS values were 11.6 and 12.4 (p<0.0001) for the PRE and POST groups. POST had more level 1 activations (696 vs. 220, p<0.0001). After controlling for age, ISS, mechanism of injury, and number of complications, mortality was significantly reduced in the POST group \geq age 77 years (OR 0.53, 95% CI: 0.3 - 0.87), (Figure 1). Hospital LOS was significantly reduced in the POST group \geq age 78 (regression coefficient -0.55, 95% CI: -1.09, -0.01) (Figure 2).

CONCLUSIONS: This study suggests geriatric trauma patients ≥ 77 years benefit from the highest level of trauma activation with shorter LOS and lower mortality. A focused approach to increasing activation level for elderly patients may decrease patient cost. LEVEL OF EVIDENCE: Level III TYPE OF STUDY: Economic/Decision.

PDF N Endnote Y

Inter-gender differences of balance indicators in persons 60-90 years of age

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Clin. Interv. Aging 2018; 13: 903-912.

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Abstract

INTRODUCTION: Precision of movements responsible for maintaining balance deteriorates with age due to natural involutionary processes, thus prompting a research question whether the values of gender-related stability indicators might differ significantly among the study subjects over 60 years of age.

METHODS: The study group comprised 136 seniors (89 women, 47 men; aged 60-90 years). The CQ-Stab 2P 2-platform posturograph was used as the main research device, whereas the Mann-Whitney *U*-test was used to evaluate the gender-related differences in the average level of variables.

RESULTS: In the open-eye test, significant gender-related differences were observed with regard to the statokinesiogram's path length in the mediolateral (ML) direction in the subjects aged 60-69 years ($p=0.004$), mean frequency of center of pressure (COP) displacement and number of COP displacements in the ML direction in the subjects aged 70-79 years ($p=0.028$, $p=0.019$), and mean COP displacement in the anteroposterior (AP) direction in the subjects aged 80-90 years ($p=0.026$). When the subjects were deprived of visual control, gender-related differences were observed with regard to the mean frequency of COP displacement, number of COP displacements in the ML direction in the subjects aged 60-69 years ($p=0.045$, $p=0.049$), and the statokinesiogram's path length in the AP direction in the subjects aged 70-79 years ($p=0.015$). In the oldest age group, the differences were noted in the statokinesiogram's path length in the AP direction ($p=0.001$), a sway area delimited by the COP point ($p=0.003$), range of AP stability ($p<0.001$), and range of ML stability ($p=0.048$).

CONCLUSION: Gender-related differences affecting postural stability were found in the elderly. Men were characterized by a lower level of postural stability when compared with women. This highlights the need to have the gender-related differences taken into account, when developing various preventive and therapeutic programs specifically aimed at compensating certain involution-dependent deficits.

PDF Y Endnote Y

Is fear of falling the missing link to explain racial disparities in fall risk? Data from the National Health and Aging Trends Study

Singh T, Belanger E, Thomas K.

Clin. Gerontol. 2018; ePub(ePub): ePub.

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Abstract

OBJECTIVES: Emerging research suggests Black older adults experience a 30% decreased risk for falls compared with their White U.S. counterparts, and this is mediated neither by physical performance nor activity. Fear of falling (FOF) is a significant risk factor for falls, yet we know little about how FOF varies by race/ethnicity. The purpose of this original research brief was to investigate the

relationship between race/ethnicity and FOF among older adults.

METHODS: 4,981 community-dwelling Medicare beneficiaries from the National Health and Aging Trends Study (NHATS) who had not self-reported a fall in the past 12 months were analyzed. Logistic regression analyses were conducted to examine the association between race/ethnicity and fear of falling, controlling for sex, age, total annual income, and mobility assistance.

RESULTS: FOF differed significantly across racial groups. Black, non-Hispanic older adults were less likely to have FOF (OR = .87, 95% CI = .71,1.07) compared with their White, non-Hispanic counterparts. In the fully adjusted model, this difference persisted and became stronger (adjusted OR = .75, 95%CI = .61,.93).

CONCLUSION: The decreased risk for falls in Black older adults could be explained by lower FOF in this group. **CLINICAL IMPLICATIONS:** These findings should inform public health fall prevention initiatives among community-dwelling older adults.

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Major causal factors influencing footwear construction parameters for elderly people

Deselnicu DC, Pantazi EM, Purcarea AA, Militaru G.

Procedia Eng. 2017; 181: 90-95.

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Abstract

Elderly people require customized products due to their unique characteristics. They have special needs in terms of footwear; very often they cannot use the mass products available on the market. The article presents the methodology and results of a fieldwork study conducted in order to identify and analyze major causal factors that influence the construction parameters of footwear designed for the elderly female population. The research problem consisted in investigating and measuring the influence of causal determinants that can significantly affect the foot parameters. The study had an exploratory and descriptive nature and employed quantitative methodology. The sample consisted of 100 persons from Bucharest, Romania, ranging from 55 to over 75 years of age. The collected data was analyzed on multiple dimensions using a statistic analysis software program. The results generated a framework encompassing the major causal biomechanical and demographic factors that need to be addressed in order to customize the constructive characteristics of footwear items for elderly people in Romania.

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Muscle mass and muscle strength are associated with pre- and post-hospitalization falls in older male inpatients: a longitudinal cohort study

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BMC Geriatr. 2018; 18(1): e116.

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Abstract

BACKGROUND: Low muscle mass and strength are highly prevalent in inpatients. It is acknowledged that low muscle mass and strength are associated with falls in community-dwelling older adults, but it is unknown if these muscle measures are also associated with falls in a population of older inpatients. This study aimed to investigate the association between muscle measures and pre- and post-hospitalization falls in older inpatients.

METHODS: An inception cohort of patients aged 70 years and older, admitted to an academic teaching hospital, was included in this study. Muscle mass and hand grip strength were measured at admission using bioelectrical impedance analysis and handheld dynamometry. Pre-hospitalization falls were dichotomized as having had at least one fall in the six months prior to admission. Post-hospitalization falls were dichotomized as having had at least one fall during the three months after discharge. Associations were analysed with logistic regression analysis.

RESULTS: The study cohort comprised 378 inpatients (mean age, SD: 79.7, 6.4 years). Fifty per cent of female and 41% of male patients reported at least one fall prior to hospitalization. Post-hospitalization, 18% of female and 23% of male patients reported at least one fall. Lower muscle mass was associated with post-hospitalization falls, and lower hand grip strength was associated with both pre- and post-hospitalization falls in male, but not in female, patients.

CONCLUSIONS: These findings confirm the likely involvement of muscle mass and strength in the occurrence of pre- and post-hospitalization falls in a population of older inpatients, but only in males.

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Reducing waste in evaluation studies on fall risk assessment tools for older people

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

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(Copyright © 2018, Elsevier Publishing)

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Abstract

OBJECTIVE: To critically appraise the recognition of methodological challenges in evaluation studies on assessment tools and nurses' clinical judgement on fall risk in older people and suggest how to reduce respective research waste. **STUDY DESIGN:** Opinion paper and narrative review covering systematic reviews on studies assessing diagnostic accuracy and impact of assessment tools and/or nurses' clinical judgement.

RESULTS: Eighteen reviews published in the last 15 years were analysed. Only one reflects potentially important factors threatening the accuracy of assessments using delayed verification with fall events as reference after a certain period of time, i.e. natural course, preventive measures and treatment paradox where accurate assessment leads to prevention of falls, i.e. influencing the reference standard and falsely indicating low diagnostic accuracy. Also, only one review mentions randomised controlled trials as appropriate study design for the investigation of the impact of fall

risk assessment tools on patient-important outcomes. Until now, only one randomised controlled trial dealing with this question has been performed showing no effect on falls and injuries. Instead of investigating the diagnostic accuracy of fall assessment tools, the focus of future research should be on the effectiveness of the implementation of fall assessment tools at reducing falls and injuries. Copyright © 2018. Published by Elsevier Inc.

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Repercussions of hospitalization due to fall of the elderly: health care and prevention

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DOI 10.1590/0034-7167-2017-0069 **PMID** 29791646

Abstract

OBJECTIVE: To know the repercussions of the fall reported by the elderly and their caregiver during hospitalization in a public hospital in Florianópolis city from October to December 2014.

METHOD: Exploratory research with a qualitative approach, conducted by depth interviews with 16 participants, the eight elderly were hospitalized for falls and eight elderly caregivers. Data analysis were performed through the Thematic Content Analysis.

RESULTS: It was evidenced the thematic axis: Faller Elderly supported by four thematic categories: Changes caused by Falls, I am a faller, I take care of me and Prevention of the Fall. The repercussions of the fall were evidenced in the impairment of the health condition, self-care and functional capacity. We observed the naturalization of the phenomenon and the passivity with the harmful consequences of the event. **Final Considerations:** The fall is valued the more negative its repercussion, such as the need for hospitalization and surgery. Managing the vulnerability of the elderly, especially in primary care, evaluating their comorbidities and their internal and external environment, will minimize unfavorable consequences and the social and financial cost of hospitalizations.

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Risk factors for incident falls in older men and women: the English Longitudinal Study of ageing

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BMC Geriatr. 2018; 18(1): e117.

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DOI 10.1186/s12877-018-0806-3 **PMID** 29769023

Abstract

BACKGROUND: Falls are a major cause of disability and death in older people, particularly women. Cross-sectional surveys suggest that some risk factors associated with a history of falls may be sex-specific, but whether risk factors for incident falls differ between the sexes is unclear. We investigated whether risk factors for incident falls differ between men and women.

METHODS: Participants were 3298 people aged ≥ 60 who took part in the Waves 4-6 surveys of the English Longitudinal Study of Ageing. At Wave 4, they provided information about sociodemographic, lifestyle, behavioural and medical factors and had their physical and cognitive function assessed. Data on incident falls during the four-year follow-up period was collected from them at Waves 5 and 6. Poisson regression with robust variance estimation was used to derive relative risks (RR) for the association between baseline characteristics and incident falls.

RESULTS: In multivariable-adjusted models that also controlled for history of falls, older age was the only factor associated with increased risk of incident falls in both sexes. Some factors were only predictive of falls in one sex, namely more depressive symptoms (RR (95% CI) 1.03 (1.01,1.06)), incontinence (1.12 (1.00,1.24)) and never having married in women (1.26 (1.03,1.53)), and greater comorbidity (1.04 (1.00,1.08)), higher levels of pain (1.10 (1.04,1.17) and poorer balance, as indicated by inability to attempt a full-tandem stand, (1.23 (1.04,1.47)) in men. Of these, only the relationships between pain, balance and comorbidity and falls risk differed significantly by sex.

CONCLUSIONS: There were some differences between the sexes in risk factors for incident falls. Our observation that associations between pain, balance and comorbidity and incident falls risk varied by sex needs further investigation in other cohorts.

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The relationship between serum IGF-1, handgrip strength, physical performance and falls in elderly men and women

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Eur. J. Endocrinol. 2018; ePub(ePub): ePub.

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Abstract

OBJECTIVE: Human aging is accompanied by a decrease in growth hormone secretion and serum IGF-1 levels. Also, loss of muscle mass, strength and impairment of physical performance, ending in a state of frailty, are seen in elderly. We aimed to investigate whether handgrip strength, physical performance and recurrent falls are related to serum IGF-1 levels in community dwelling elderly.

DESIGN: Observational cohort study (cross-sectional and prospective).

METHODS: We studied the association between IGF-1 and handgrip strength, physical performance and falls in participants of the Longitudinal Aging Study Amsterdam. 1292 participants were included (633 men, 659 women). Serum IGF-1 levels were divided into quartiles (IGF-1-Q1 to IGF-1-Q4). Data on falls were collected prospectively for a period of three years. All analyses were stratified for age and physical activity and adjusted for relevant confounders.

RESULTS: Men with a low physical activity score in IGF-1-Q1 and IGF-1-Q2 of the younger age group had a lower handgrip strength compared to IGF-1-Q4. In younger more active males in IGF-1-Q2 physical performance was worse. Recurrent fallers were less prevalent in older, low active males with low IGF-1 levels. In females, recurrent fallers were more prevalent in older, more active females in IGF-1-Q2. IGF-1 quartile may predict changes in handgrip strength and physical performance in

men and women.

CONCLUSIONS: Our results indicate that lower IGF-1 levels are associated with lower handgrip strength and worse physical performance, but less recurrent fallers especially in men. Associations were often more robust in IGF-1-Q2. Future studies on this topic are desirable.

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Therapists' perspectives on adapting the Stepping On falls prevention programme for community-dwelling stroke survivors in Singapore

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Abstract

PURPOSE: This study investigates the perspectives of rehabilitation therapists on the implementation of fall prevention programmes with community-dwelling stroke survivors in the Singapore context, and elicits recommendations to adapt the Stepping On programme with stroke survivors.

METHOD: Qualitative data were elicited during 4 focus groups with 23 rehabilitation therapists (15 occupational therapists [OTs]; 8 physiotherapists [PTs]) who had received training to deliver the original Stepping On programme, and had experienced delivery of fall-prevention intervention programmes locally. Collected data were analysed using thematic analysis method.

RESULTS: Three themes emerged from the focus groups describing: (a) limitations of existing falls prevention intervention for stroke clients; (b) the need to adapt the Stepping On programme to use with stroke clients; and (c) challenges in implementing fall prevention programmes in the stroke context. A series of new components were suggested to be included as part of the Stepping On after stroke (SOAS) programme, including involvement of family members and caregivers, and tailored community reintegration sessions (such as taking public transport and shopping).

CONCLUSIONS: Rehabilitation therapists describe challenges in addressing fall prevention within a stroke context, and findings highlight the need for a structured, stroke-specific fall prevention programme rather than a more general approach to education and training. Contextual components identified provide valuable inputs towards the development of a culturally relevant fall prevention programme for stroke survivors in Singapore. Implications for Rehabilitation Stroke survivors living in the community are at a high risk of falls. A structured and culturally relevant fall prevention programme for community-living stroke survivors is needed. Falls prevention for community-living stroke survivors should be multi-dimensional and targeting the modifiable risk factors for falls in this group. Both stroke survivors and caregivers should be involved in any fall prevention after stroke programmes.

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Wide step width reduces knee abduction moment of obese adults during stair negotiation

Yocum D, Weinhandl JT, Fairbrother JT, Zhang S.

J. Biomech. 2018; ePub(ePub): ePub.

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Abstract

PURPOSE: An increased likelihood of developing obesity-related knee osteoarthritis may be associated with increased peak internal knee abduction moments (KAbM). Increases in step width (SW) may act to reduce this moment. The purpose of this study was to determine the effects of increased SW on knee biomechanics during stair negotiation of healthy-weight and obese participants.

METHODS: Participants (24: 10 obese and 14 healthy-weight) used stairs and walked over level ground while walking at their preferred speed in two different SW conditions - preferred and wide (200% preferred). A 2 × 2 (group × condition) mixed model analysis of variance was performed to analyze differences between groups and conditions ($p < 0.05$).

RESULTS: Increased SW increased the loading-response peak knee extension moment during descent and level gait, decreased loading-response KAbMs, knee extension and abduction range of motion (ROM) during ascent, and knee adduction ROM during descent. Increased SW increased loading-response peak mediolateral ground reaction force (GRF), increased peak knee abduction angle during ascent, and decreased peak knee adduction angle during descent and level gait. Obese participants experienced disproportionate changes in loading-response mediolateral GRF, KAbM and peak adduction angle during level walking, and peak knee abduction angle and ROM during ascent.

CONCLUSION: Increased SW successfully decreased loading-response peak KAbM. Implications of this finding are that increased SW may decrease medial compartment knee joint loading, decreasing pain and reducing joint deterioration. Increased SW influenced obese and healthy-weight participants differently and should be investigated further.

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