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Constructing definitions of safety risks while nurses care for hospitalised older people: secondary analysis of qualitative data

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Abstract

AIM: The aim of this secondary qualitative descriptive analysis was to examine how nurses construct a definition of older peoples' safety risks and provide care while working within organisational contexts that are focused on diminishing patient risks.

BACKGROUND: Numbers of older patients are increasing in acute hospital contexts-contexts that place their focus on patient safety. Nurses need to manage tensions between older peoples' risks, evidence-informed practice decisions, limited resources and organisational emphases on patient falls. To date, their practice dilemmas have not been well examined.

DESIGN: A secondary qualitative descriptive analysis was conducted using data that were collected between June 2010 and May 2011 to examine nursing practice with hospitalised older people.

METHODS: All field notes and transcribed data were reviewed to generate themes representing 18 Registered Nurses' perceptions about safe care for hospitalised older people. The first author generated categories that described how nurses construct definitions of safety risks for older people. All authors engaged in an iterative analytic process that resulted in themes capturing nurses' efforts to provide care in limited resource environments while considering older peoples' safety risks.

RESULTS: Nurses constructed definitions of patient safety risks in the context of institutional directives. Nurses provided care using available resources as efficiently as possible and accessing co-worker support. They also minimised the importance of older people's functional abilities by setting priorities for medically delegated tasks and immobilising their patients to reduce their risks.

CONCLUSIONS: Nurses' definitions of patient risk, which were shaped by impoverished institutional resources and nurses' lack of valuing of functional abilities, contributed to suboptimal care for older adults. Nurses' definitions of risk as physical injury reduced their attention to patients' functional abilities, which nurses reported suffered declines as a result.

IMPLICATIONS FOR PRACTICE: Leaders need to examine how organisational emphases on particular areas of patient safety and resource constraints contribute to suboptimal care of older people.

Nurses understanding of patient risk must incorporate older patients' functional abilities.

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External validation of the Probability of Repeated Admission (PRA) risk prediction tool in older community-dwelling people attending general practice: a prospective cohort study

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BMJ Open 2016; 6(11): e012336.

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Abstract

OBJECTIVES: Emergency admission is associated with the potential for adverse events in older people and risk prediction models are available to identify those at highest risk of admission. The aim of this study was to externally validate and compare the performance of the Probability of repeated admission (Pra) risk model and a modified version (incorporating a multimorbidity measure) in predicting emergency admission in older community-dwelling people. **SETTING:** 15 general practices (GPs) in the Republic of Ireland.

PARTICIPANTS: n=862, ≥ 70 years, community-dwelling people prospectively followed up for 2 years (2010-2012).

EXPOSURE: Pra risk model (original and modified) calculated for baseline year where ≥ 0.5 denoted high risk (patient questionnaire, GP medical record review) of future emergency admission.

PRIMARY OUTCOME: Emergency admission over 1 year (GP medical record review).

STATISTICAL ANALYSIS: descriptive statistics, model discrimination (c-statistic) and calibration (Hosmer-Lemeshow statistic).

RESULTS: Of 862 patients, a total of 154 (18%) had ≥ 1 emergency admission(s) in the follow-up year. 63 patients (7%) were classified as high risk by the original Pra and of these 26 (41%) were admitted. The modified Pra classified 391 (45%) patients as high risk and 103 (26%) were subsequently admitted. Both models demonstrated only poor discrimination (original Pra: c-statistic 0.65 (95% CI 0.61 to 0.70); modified Pra: c-statistic 0.67 (95% CI 0.62 to 0.72)). When categorised according to risk-category model, specificity was highest for the original Pra at cut-point of ≥ 0.5 denoting high risk (95%), and for the modified Pra at cut-point of ≥ 0.7 (95%). Both models overestimated the number of admissions across all risk strata.

CONCLUSIONS: While the original Pra model demonstrated poor discrimination, model specificity was high and a small number of patients identified as high risk. Future validation studies should examine higher cut-points denoting high risk for the modified Pra, which has practical advantages in terms of application in GP. The original Pra tool may have a role in identifying higher-risk community-dwelling older people for inclusion in future trials aiming to reduce emergency admissions.

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Frailty and incident depression in community-dwelling older people: results from the ELSA study

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Abstract

OBJECTIVE: Frailty and pre-frailty are two common conditions in the older people, but whether these conditions could predict depression is still limited to a few longitudinal studies. In this paper, we aimed to investigate whether frailty and pre-frailty are associated with an increased risk of depression in a prospective cohort of community-dwelling older people.

METHODS: Four thousand seventy-seven community-dwelling men and women over 60 years without depression at baseline were included from the English Longitudinal Study of Ageing. Frailty status was defined according to modified Fried's criteria (weakness, weight loss, slow gait speed, low physical activity and exhaustion) and categorized as frailty (≥ 3 criteria), pre-frailty (1-2 criteria) or robustness (0 criterion). Depression was diagnosed as ≥ 4 out of 8 points of Center for Epidemiologic Studies Depression Scale, after 2 years of follow-up.

RESULTS: Over a 2-year follow-up, 360 individuals developed depression. In a logistic regression analysis, adjusted for 18 potential baseline confounders, pre-frailty (odds ratio (OR) = 0.89; 95% confidence interval (CI), 0.54-1.46; $p = 0.64$) and frailty (OR = 1.22; 95% CI, 0.90-1.64; $p = 0.21$) did not predict the onset of depression at follow-up. Among the criteria included in the frailty definition, only slow gait speed (OR = 1.82; 95% CI, 1.00-3.32; $p = 0.05$) appeared to predict a higher risk of depression.

CONCLUSIONS: Among older community dwellers, frailty and pre-frailty did not predict the onset of depression during 2 years of follow-up, when accounting for potential confounders, whilst slow gait speed considered alone may predict depression in the older people. Copyright © 2017 John Wiley & Sons, Ltd.

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Ginkgo biloba special extract LI 1370 improves dual-task walking in patients with MCI: a randomised, double-blind, placebo-controlled exploratory study

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Abstract

BACKGROUND: In patients with mild cognitive impairment (MCI), gait instability, particularly in dual-task situations, has been associated with impaired executive function and an increased fall risk. Ginkgo biloba extract (GBE) could be an effective mean to improve gait stability. **AIMS:** This study investigated the effect of GBE on spatio-temporal gait parameters of MCI patients while walking under single and dual-task conditions.

METHODS: Fifty patients aged 50-85 years with MCI and associated dual-task-related gait impairment participated in this randomised, double-blind, placebo-controlled, exploratory phase IV drug trial. Intervention group (IG) patients received GBE (Symfona[®]) forte 120 mg) twice-daily for 6 months while control group (CG) patients received placebo capsules. A 6-month open-label phase with identical GBE dosage followed. Gait was quantified at months 0, 3, 6 and 12.

RESULTS: After 6 months, dual-task-related cadence increased in the IG compared to the CG ($p = 0.019$, $d = 0.71$). No significant changes, but GBE-associated numerical non-significant trends were found after 6-month treatment for dual-task-related gait velocity and stride time variability.

DISCUSSION: Findings suggest that 120 mg of GBE twice-daily for at least 6 months may improve dual-task-related gait performance in patients with MCI.

CONCLUSIONS: The observed gait improvements add to the understanding of the self-reported unspecified improvements among MCI patients when treated with standardised GBE.

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Medication use and risk of falls among nursing home residents: a retrospective cohort study

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Abstract

BACKGROUND: Geriatric falls are leading causes of hospital trauma admissions and injury-related deaths. Medication use is a crucial element among extrinsic risk factors for falls. To reduce fall risk and the prevalence of adverse drug reactions, potentially inappropriate medication (PIM) lists are widely used.

OBJECTIVE: Our aim was to investigate the possible predictors of geriatric falls annualized over a 5-year-long period, as well as to evaluate the medication use of nursing home residents. Setting Nursing home residents were recruited from the same institution between 2010 and 2015 in Szeged, Hungary.

METHOD: A retrospective epidemiological study was performed. Patient data were analysed for the first 12 months of residency. Chi-squared test and Fisher's-test were applied to compare the categorical variables, Student's t test to compare the continuous variables between groups. Binary logistic regression analysis was carried out to determine the association of falls with other variables found significant in univariate analysis. Microsoft Excel, IBM SPSS Statistics (version 23) and R (3.2.2) programs were used for data analysis. Main outcome measure Falls affected by age, gender, number of chronic medications, polypharmacy, PIM meds.

RESULTS: A total of 197 nursing home residents were included, 150 (76.2%) women and 47 (23.8%) men, 55 fallers (annual fall prevalence rate was 27.9%) and 142 non-fallers. Gender was not a predisposing factor for falls (prevalence in males: 23.4 vs 29.3% in females, $p > 0.05$). Fallers were older (mean years \pm SD; 84.0 ± 7.0) than non-fallers (80.1 ± 9.3 , $p < 0.01$). The age ≥ 80 years was a significant risk factor for falls ($p < 0.001$). The number of chronic medications was higher in male fallers (12.4 ± 4.0) than in non-fallers (6.9 ± 4.2 , $p < 0.001$). Polypharmacy (taking four or more chronic medications) was a significant risk factor of falls ($p < 0.01$). Those PIMs carrying fall risk were taken by 70.9% of fallers and 75.3% of non-fallers ($p > 0.05$). Taking pantoprazole, vinpocetine or trimetazidine was a significant risk factor for falls.

CONCLUSION: Older age, polypharmacy and the independent use of pantoprazole, vinpocetine, and trimetazidine were found to be major risk factors for falls. Further real-life epidemiological studies are necessary to confirm the role of particular active agents, and to help professionals prescribe, evaluate and review geriatric medication use.

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Neighborhood environment and falls among community-dwelling older adults

Nicklett EJ, Lohman MC, Smith ML.

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Abstract

BACKGROUND: Falls present a major challenge to active aging, but the relationship between neighborhood factors and falls is poorly understood. This study examined the relationship between fall events and neighborhood factors, including neighborhood social cohesion (sense of belonging, trust, friendliness, and helpfulness) and physical environment (vandalism/graffiti, rubbish, vacant/deserted houses, and perceived safety walking home at night).

METHODS: Data were analyzed from 9259 participants over four biennial waves (2006-2012) of the Health and Retirement Study (HRS), a nationally representative sample of adults aged 65 and older in the United States.

RESULTS: In models adjusting for demographic and health-related covariates, a one-unit increase in neighborhood social cohesion was associated with 4% lower odds of experiencing a single fall (odds ratio (OR): 0.96, 95% confidence interval (CI): 0.93-0.99) and 6% lower odds of experiencing multiple falls (OR: 0.94, 95% CI: 0.90-0.98). A one-unit increase in the physical environment scale was associated with 4% lower odds of experiencing a single fall (OR: 0.96, 95% CI: 0.93-0.99) and with 5% lower odds of experiencing multiple falls (OR: 0.95, 95% CI: 0.91-1.00) in adjusted models.

CONCLUSIONS: The physical and social neighborhood environment may affect fall risk among community-dwelling older adults.

FINDINGS support the ongoing need for evidence-based fall prevention programming in community and clinical settings.

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Observing prioritization effects on cognition and gait: The effect of increased cognitive load on cognitively healthy older adults' dual-task performance

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Gait Posture 2017; 53: 139-144.

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Abstract

Previous studies exploring the effects of attention-prioritization on cognitively healthy older adults' gait and cognitive dual task (DT) performance have shown DT cost in gait outcomes but inconsistent effects on cognitive performance, which may reflect task difficulty (the cognitive load). This study aimed to identify whether changing the cognitive load during a walking and counting DT improved the challenge/sensitivity of the cognitive task to observe prioritization effects on concurrent gait and cognitive performance outcomes. Seventy-two cognitively healthy older adults (Mean=73years) walked 15m, counted backwards in 3s and 7s as single tasks (ST), and concurrently walked and counted backwards as DTs. Attention-prioritization was examined in Prioritizing Walking (PW) and Prioritizing Counting (PC) DT conditions. Dual-task performance costs (DTC) were calculated for number of correct cognitive responses (CCR) in the counting tasks, and step-time variability and velocity in the gait task. All DT conditions showed a benefit (DTB) for cognitive outcomes with trade-off cost to gait. In the Serial 3s task, the cognitive DTBs increased in PC over the PW condition ($p<0.05$), with a greater cost to walking velocity ($p<0.05$). DT effects were more pronounced in the Serial 7s with a lower cognitive DTB when PC than when PW, ($p<0.05$) with no trade-off increase in cost to gait outcomes ($p<0.05$). The findings suggest that increased cognitive load during a gait and

cognitive DT produces more pronounced gait measures of attention-prioritization in cognitively healthy older adults. A cognitive load effect was also observed in the cognitive outcomes, with unexpected results.

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Older adults' perceptions of and preferences for a fall risk assessment system: exploring stages of acceptance model

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Comput. Inform. Nurs. 2017; ePub(ePub): ePub.

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Abstract

Aging in place is a preferred and cost-effective living option for older adults. Research indicates that technology can assist with this goal. Information on consumer preferences will help in technology development to assist older adults to age in place. The study aim was to explore the perceptions and preferences of older adults and their family members about a fall risk assessment system. Using a qualitative approach, this study examined the perceptions, attitudes, and preferences of 13 older adults and five family members about their experience living with the fall risk assessment system during five points in time. Themes emerged in relation to preferences and expectations about the technology and how it fits into daily routines. We were able to capture changes that occurred over time for older adult participants.

RESULTS indicated that there was acceptance of the technology as participants adapted to it. Two themes were present across the five points in time-safety and usefulness. Five stages of acceptance emerged from the data from preinstallation to 2 years postinstallation. Identified themes, stages of acceptance, and design and development considerations are discussed.

PDF Endnote Y

Physical activity and exercise as countermeasures to physical frailty and sarcopenia

Marzetti E, Calvani R, Tosato M, Cesari M, Di Bari M, Cherubini A, Broccatelli M, Saveria G, D'Elia M, Pahor M, Bernabei R, Landi F.

Aging Clin. Exp. Res. 2017; ePub(ePub): ePub.

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Abstract

The identification of cost-effective interventions that improve the health status and prevent disability in old age is one of the most important public health challenges. Regular physical activity is the only intervention that has consistently been shown to improve functional health and energy balance and to reduce the risk of cardiovascular disease, stroke, diabetes, several cancers, depression and falls. In advanced age, physical activity is also effective at mitigating sarcopenia, restoring robustness, and preventing/delaying the development of disability. On the other hand,

physical inactivity is recognized as one of the leading causes of several chronic degenerative diseases and is also a major contributing factor to sarcopenia and functional disability. This compelling evidence has prompted the World Health Organization to recommend engaging in regular physical activity throughout one's life course. The present review summarizes the available evidence in support of physical activity as a remedy against physical frailty and sarcopenia. The relevant pathways through which the benefits of physical activity are conveyed are also discussed.

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PreventTing Falls in a high-risk, vision-impaired population through specialist ORientation and Mobility services: protocol for the PlaTFORM randomised trial

Keay L, Dillon L, Clemson L, Tiedemann A, Sherrington C, McCluskey P, Ramulu P, Jan S, Rogers K, Martin J, Tinsley F, Jakobsen KB, Ivers RQ.

Inj. Prev. 2017; ePub(ePub): ePub.

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Abstract

BACKGROUND: Older people with vision impairment have significant ongoing morbidity, including risk of falls, but are neglected in fall prevention programmes. PlaTFORM is a pragmatic evaluation of the Lifestyle-integrated Functional Exercise fall prevention programme for older people with vision impairment or blindness (v-LiFE). Implementation and scalability issues will also be investigated.

METHODS: PlaTFORM is a single-blinded, randomised trial designed to evaluate the v-LiFE programme compared with usual care. Primary outcomes are fall rate over 12 months, measured using prospective monthly fall calendars, and function and participation assessed by the Late-Life Function and Disability Instrument (Late-Life FDI) Function component. The secondary outcome is rate of falls requiring medical care. Activity-normalised fall rate will be estimated using accelerometer-measured physical activity data. EuroQol 5-dimension 5-level questionnaire will measure quality of life and impact of falls. Health record linkage will estimate resource use associated with falls. v-LiFE cost-effectiveness will be determined compared with usual care. 500 participants (250 per group) can provide 90% power to detect a significant between-group difference in fall rates; 588 will be recruited to allow for drop-out. Falls per person-year and Late-Life FDI will be compared between groups.

DISCUSSION: PlaTFORM will determine if falls can be prevented among older people with vision loss through a home-based exercise programme. v-LiFE embeds balance and strength training within everyday activities with the aim of preventing falls. The study will also determine whether the programme can be effectively delivered by personnel who provide Orientation and Mobility training for people with vision impairment.

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Reducing falls after hospital discharge: a protocol for a randomised controlled trial evaluating an individualised multimodal falls education programme for older adults

Hill AM, Etherton-Bear C, McPhail SM, Morris ME, Flicker L, Shorr R, Bulsara M, Lee DC, Francis-Coad J, Waldron N, Boudville A, Haines T.

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Abstract

INTRODUCTION: Older adults frequently fall after discharge from hospital. Older people may have low self-perceived risk of falls and poor knowledge about falls prevention. The primary aim of the study is to evaluate the effect of providing tailored falls prevention education in addition to usual care on falls rates in older people after discharge from hospital compared to providing a social intervention in addition to usual care.

METHODS AND ANALYSES: The 'Back to My Best' study is a multisite, single blind, parallel-group randomised controlled trial with blinded outcome assessment and intention-to-treat analysis, adhering to CONSORT guidelines. Patients (n=390) (aged 60 years or older; score more than 7/10 on the Abbreviated Mental Test Score; discharged to community settings) from aged care rehabilitation wards in three hospitals will be recruited and randomly assigned to one of two groups. Participants allocated to the control group shall receive usual care plus a social visit. Participants allocated to the experimental group shall receive usual care and a falls prevention programme incorporating a video, workbook and individualised follow-up from an expert health professional to foster capability and motivation to engage in falls prevention strategies. The primary outcome is falls rates in the first 6 months after discharge, analysed using negative binomial regression with adjustment for participant's length of observation in the study. Secondary outcomes are injurious falls rates, the proportion of people who become fallers, functional status and health-related quality of life. Healthcare resource use will be captured from four sources for 6 months after discharge. The study is powered to detect a 30% relative reduction in the rate of falls (negative binomial incidence ratio 0.70) for a control rate of 0.80 falls per person over 6 months.

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.

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Serious fall injuries before and after initiation of hemodialysis among older ESRD patients in the United States: a retrospective cohort study

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Am. J. Kidney Dis. 2017; ePub(ePub): ePub.

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Abstract

BACKGROUND: Because initiation of dialysis therapy often occurs in the setting of acute illness and may signal worsening health and functional decline, we examined whether rates of serious fall injuries among older hemodialysis patients differ before and after dialysis therapy initiation. **STUDY DESIGN:** Retrospective cohort study of claims data from the 2 years spanning dialysis therapy initiation among patients initiating dialysis therapy in 2010 to 2012.

SETTING & PARTICIPANTS: Claims from 81,653 Medicare end-stage renal disease beneficiaries aged 67 to 100 years.

PREDICTOR: Post- versus pre-dialysis therapy initiation periods, defined as on or after versus before dialysis therapy initiation.

OUTCOMES: Serious fall injuries were defined using diagnostic codes for falls in combination with fractures, brain injuries, or joint dislocation. Incidence rate ratios (overall and stratified) for post- versus pre-dialysis therapy initiation periods were estimated using generalized estimating equation models with a negative binomial link.

RESULTS: Overall, 12,757 serious fall injuries occurred in the pre- and post-dialysis therapy initiation periods. Annual rates of serious fall injuries were 64.4 (95% CI, 62.7-66.2) and 107.8 (95% CI, 105.4-110.3) per 1,000 patient-years, respectively, in the pre- and post-dialysis therapy initiation periods (incidence rate ratio, 1.62; 95% CI, 1.56-1.67). Relative rates of serious fall injuries in the post- vs pre-dialysis initiation periods were of greater magnitude among patients who were younger (<75 years), had pre-end-stage renal disease nephrology care, had albumin levels > 3g/dL, were able to walk and transfer, did not need assistance with activities of daily living, and were not institutionalized compared with relative rates among their counterparts. **LIMITATIONS:** Potential misclassification due to the use of claims data and survival bias among those initiating hemodialysis therapy.

CONCLUSIONS: Among older Medicare beneficiaries receiving hemodialysis, serious fall injuries are common, the post-dialysis initiation period is a high-risk time for falls, and dialysis therapy initiation may be an important time to screen for fall risk factors and implement multifactorial fall prevention strategies.

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PDF Y Endnote Y

Serious psychological distress, sex, and falls among the elderly

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J. Women Aging. 2017; ePub(ePub): ePub.

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Abstract

Serious psychological distress and falls are two major public health problems among the elderly. This study aims to test the hypothesis that although serious psychological distress can increase the risks of falls among the elderly, it tends to affect elderly women more than elderly men. Data of this study are from the 2011 California Health Survey Interviews (CHIS). We extracted a sample of 13,153 respondents aged 65 and older for this study, including 8,087 females and 5,066 males. We tested

both unadjusted and adjusted interaction effects using bivariate and multivariate logistic regression analysis. Elderly women with serious psychological distress had the greatest likelihood of falls as compared to men with serious psychological distress and men and women without serious psychological distress. With respect to the covariates, limitations of physical activity and poor self-rated health status, Asian race, and older age were more likely to be associated with falls. This study provides further information on sex disparities of falls among the elderly such that serious psychological distress has a greater impact on falls for elderly women than elderly men. Thus, the findings of our studies suggest that mental health services and intervention can be useful to prevent falls for elderly women.

PDF Y Endnote Y

Study of individualization and bias in nursing home fall prevention practices

Colón-Emeric CS, Corazzini K, McConnell E, Pan W, Toles M, Hall R, Batchelor-Murphy M, Yap TL, Anderson AL, Burd A, Anderson RA.

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Abstract

OBJECTIVES: Little is known about how nursing home staff use resident characteristics to individualize care delivery or whether care is affected by implicit bias.

DESIGN: Randomized factorial clinical vignette survey.

SETTING: Sixteen nursing homes in North Carolina.

PARTICIPANTS: Nursing, rehabilitation, and social services staff (n = 433).

MEASUREMENTS: Vignettes describing hypothetical residents were generated from a matrix of clinical and demographic characteristics. Resident age, race and gender were suggested by a photo. Participants completed up to four randomly assigned vignettes (n = 1615), rating the likelihood that 12 fall prevention activities would be used for the resident. Fixed and random effects mixed model analysis examined the impact of vignette resident characteristics and staff characteristics on four intervention categories.

RESULTS: Staff reported a higher likelihood of fall prevention activities in all four categories for residents with a prior fall (0.2-0.5 points higher, 10 point scale, $P < 0.05$), but other risk factors did not affect scores. There was little evidence of individualization; only dementia increased the reported likelihood of environmental modification (0.3, $P < 0.001$, 95% CI 0.2-0.5). Individualization did not vary with staff licensure category or clinical experience. Registered nurses consistently reported higher likelihoods of all fall prevention activities than did licensed practical nurses, unlicensed staff and other professional staff (1.0-2.7 points, $P < 0.001$ to 0.005). There was a small degree of implicit racial bias; staff indicated that environmental modification would be less likely to occur in otherwise identical vignettes including a photo of a black rather than a white resident (-0.2 points, 95% CI -0.3 to -0.1).

CONCLUSION: Nursing home staff report a standardized approach to fall prevention without individualization. We found a small impact from implicit racial bias that should be further explored.

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Treatment charges for traumatic brain injury among older adults at a trauma center

Albrecht JS, Slejko JF, Stein DM, Smith GS.

J. Head Trauma Rehabil. 2017; ePub(ePub): ePub.

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Abstract

OBJECTIVE: To provide charge estimates of treatment for traumatic brain injury (TBI), including both hospital and physician charges, among adults 65 years and older treated at a trauma center.

METHODS: We identified older adults treated for TBI during 2008-2012 (n = 1843) at Maryland's Primary Adult Resource Center and obtained hospital and physician charges separately. Analyses were stratified by sex and all charges were inflated to 2012 dollars. Total TBI charges were modeled as a function of covariates using a generalized linear model.

RESULTS: Women comprised 48% of the sample. The mean unadjusted total TBI hospitalization charge for adults 65 years and older was \$36 075 (standard deviation, \$63 073). Physician charges comprised 15% of total charges. Adjusted mean charges were lower in women than in men (adjusted difference, -\$894; 95% confidence interval, -\$277 to -\$1512). Length of hospital and intensive care unit stay were associated with the highest charges.

CONCLUSIONS: This study provides the first estimates of hospital and physician charges associated with hospitalization for TBI among older adults at a trauma center that will aid in resource allocation, triage decisions, and healthcare policy.

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Validity, test-retest reliability, sensitivity to change and feasibility of motor-cognitive dual task assessments in patients with dementia

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Abstract

OBJECTIVE: To investigate validity, test-retest reliability, sensitivity to change, and feasibility of dual task (DT) assessments in patients with dementia.

DESIGN: Validation study.

SETTING: Post ward-rehabilitation.

PARTICIPANTS: Geriatric patients (n=105) with dementia (age 82.7±5.9, MMSE score 21.9). **MAIN**

OUTCOME MEASURES: Psychometric quality of DT performance of different DT-tests. Analyses were performed for motor and cognitive performance, and relative DT costs (DTCs).

RESULTS: Spearman's rank correlations (r_s) between examined DT-tests were moderate-high for motor tasks ($r_s=0.29-0.90$), small-high for cognitive tasks ($r_s=0.12-0.55$) and small-high for relative DTCs (motor DTCs $r_s=0.02-0.61$, cognitive DTCs $r_s=-0.19$ to 0.06 , combined DTCs $r_s=-0.11$ to 0.31). Correlations with external assessment were moderate-high for motor tasks ($r_s=0.25-0.84$), small-moderate for cognitive tasks ($r_s=-0.10$ to 0.46) and small-moderate for relative DTCs (motor DTCs $r_s=-0.09$ to 0.17 , cognitive DTCs $r_s=-0.03$ to 0.21 , combined DTCs $r_s=-0.07$ to 0.26). Test-retest reliability was excellent for motor tasks ($ICC=0.75-0.96$), fair-excellent for cognitive tasks ($ICC=0.51-0.88$) and poor-good for relative DTCs (motor DTCs $ICC=0.10-0.74$, cognitive DTCs $ICC=0.05-0.65$, combined DTCs $ICC=0.15-0.71$). Sensitivity to change was acceptable-excellent for trained DT-tests ($p \leq 0.01$). Effect sizes were small-large for gait parameters ($SRM=0.30-1.12$), large for cognitive tasks ($SRM=0.82-0.95$) and small-large for relative DTCs (motor DTCs $SRM=0.15-0.77$, cognitive DTCs $SRM=0.56-0.98$, combined DTCs $SRM=0.40-1.10$). Completion time ranged from 13.1 to 16.9min.

CONCLUSIONS: All DT-tests showed acceptable-excellent psychometric properties in patients with dementia with highest quality for the gait-based tests 'Walking & Counting' and 'Walking & reciting ABC'.

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Falling while walking: a hidden contributor to pedestrian injury

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Abstract

Walking is a sustainable mode of transportation which is beneficial to both individuals and to the broader community, however, there are risks and it is essential that road design and operation provides safe conditions for walking. In Victoria, pedestrians represent one of the most vulnerable road user groups, accounting for approximately 12% of all road fatalities and serious injuries. These figures largely represent injuries where the pedestrian has been struck by a vehicle with the extent of pedestrian-only injuries largely un-reported. Falling while walking may be a significant contributor to pedestrian only injuries. Indeed, the World Health Organisation has identified falls generally as the second leading cause of unintentional injury death in older populations. Despite the prevalence of fall-related injuries, there has been relatively little research undertaken to address the issues surrounding falls that occur while walking for transport and in public spaces. This study, therefore, aimed to address this gap in our knowledge. Analyses of various data sources were undertaken to enhance our understanding of fall-related injuries while walking in Victoria. Two sources of data were accessed: Only 85 fall-related incidents were reported in the crash-based data, however, pedestrian falls while walking in the road environment accounted for an average of 1680 hospital admissions and 3545 emergency department presentations each year, and this number is rising. The findings in this study show clearly that Police data is of little use when attempting to understand issues of safe travel for pedestrians other than vehicle-pedestrian incidents. However, analysis of hospital data provides a more realistic indication of the extent of pedestrian fall-related injuries and highlights the significant number of pedestrian fall-related injuries that occur each year. Moreover, the findings identified that older pedestrians are significantly over-represented amongst fall-related

injuries that require hospital admission, while also having the highest rate of emergency department presentations when adjusting for age and exposure based on estimates of aggregate walking distances. The study also highlighted that the most common injury sustained from a fall were fractures. The implications of these findings and identification of 'best-practice' within a Safe System context are discussed in terms of enhancements to the physical environment (particularly footpath, kerb and ramp construction and maintenance), implementation of fall hazard assessment and management strategies, and educational programs to highlight the risks for falls and recommend preventative strategies, and overall enhancements of general fall interventions to include falls while walking outside (including exercise interventions). In addition, a number of research and data needs, particularly collection of in-depth data to identify contributory factors and injury outcomes related to falls while walking incidents.

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Observing prioritization effects on cognition and gait: The effect of increased cognitive load on cognitively healthy older adults' dual-task performance

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Abstract

Previous studies exploring the effects of attention-prioritization on cognitively healthy older adults' gait and cognitive dual task (DT) performance have shown DT cost in gait outcomes but inconsistent effects on cognitive performance, which may reflect task difficulty (the cognitive load). This study aimed to identify whether changing the cognitive load during a walking and counting DT improved the challenge/sensitivity of the cognitive task to observe prioritization effects on concurrent gait and cognitive performance outcomes. Seventy-two cognitively healthy older adults (Mean=73years) walked 15m, counted backwards in 3s and 7s as single tasks (ST), and concurrently walked and counted backwards as DTs. Attention-prioritization was examined in Prioritizing Walking (PW) and Prioritizing Counting (PC) DT conditions. Dual-task performance costs (DTC) were calculated for number of correct cognitive responses (CCR) in the counting tasks, and step-time variability and velocity in the gait task. All DT conditions showed a benefit (DTB) for cognitive outcomes with trade-off cost to gait. In the Serial 3s task, the cognitive DTBs increased in PC over the PW condition ($p<0.05$), with a greater cost to walking velocity ($p<0.05$). DT effects were more pronounced in the Serial 7s with a lower cognitive DTB when PC than when PW, ($p<0.05$) with no trade-off increase in cost to gait outcomes ($p<0.05$). The findings suggest that increased cognitive load during a gait and cognitive DT produces more pronounced gait measures of attention-prioritization in cognitively healthy older adults. A cognitive load effect was also observed in the cognitive outcomes, with unexpected results.

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Older adults exhibit altered motor coordination during an upper limb object transport task requiring a lateral change in support

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Abstract

Investigating an ecologically relevant upper limb task, such as manually transporting an object with a concurrent lateral change in support (sidestepping alongside a kitchen counter), may provide greater insight into potential deficits in postural stability, variability and motor coordination in older adults. Nine healthy young and eleven older, community dwelling adults executed an upper limb object transport task requiring a lateral change in support in two directions at two self-selected speeds, self-paced and fast-paced. Dynamic postural stability and movement variability was quantified via whole-body center of mass motion. The onset of lead lower limb movement in relation to object movement onset was quantified as a measure of motor coordination. Older adults demonstrated similar levels of stability and variability as their younger counterparts, but at slower peak movement velocity and increased task duration. Furthermore, older adults demonstrated asymmetrical motor coordination between left and right task directions, while younger adults remained consistent regardless of task direction. Thus, older adults significantly modulated movement speed and motor coordination to maintain similar levels of stability and variability compared to their younger counterparts.

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Predictive factors of dependency in activities of daily living following limb trauma in the elderly

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Abstract

BACKGROUND: Traumatic injuries in the elderly often lead to permanent disabilities and long-term treatments that can adversely influence their activities of daily living (ADL). The effect on ADL is an important outcome in elderly trauma.

OBJECTIVES: The present study was designed to evaluate the predictive factors of dependency in ADL following limb trauma in elderly referred to Shahid Beheshti Hospital, Kashan, Iran, in 2013.

PATIENTS AND METHODS: This descriptive study was conducted on 200 traumatic patients admitted to the trauma emergency ward of Shahid Beheshti hospital in 2013. The questionnaire used in this study had three parts: demographic data, information related to trauma, and an independence scale of ADL (ISADL). The ISADL was completed in the emergency ward to declare pre-traumatic status; it was also completed one and three months after trauma. Statistical analysis was conducted by the t-test and analysis of variance (ANOVA). The repeated measure was used to study the trend of the ISADL and other demographic variables. The multiple regression analysis was also used to declare

the predictive variables related to the ISADL.

RESULTS: The study population consisted of 81 males (40.5%) and 119 females (59.5%). The participants' average age was 70.57 ± 9.05 years. In total, 80.5% of the elderly were completely independent in ADL before trauma; this decreased to 13.5% one month after trauma. The repeated measure analysis showed a significant improvement in the ISADL three months after trauma. Gender, age, and education had significant interaction with the ISADL. The multiple regression analysis showed that type of trauma and location of injured organ had predictive values related to the ISADL, one and three months after trauma. The place and cause of trauma, and having surgery showed a significant relationship with the ISADL three months after trauma.

CONCLUSIONS: Many factors, such as gender, age, education, type of trauma, and location of injured organ, may predict ADL following limb trauma.

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Profile differences of purchasers, non-purchasers, and users and non-users of personal emergency response systems: results of a prospective cohort study

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Abstract

BACKGROUND: 'Personal Emergency Response Systems' (PERS) can provide a solution for raising the alert after a fall but no criteria are available to enable us to estimate whether a population which is set to benefit from a PERS will be able to use the device.

OBJECTIVE: To describe the profile differences of purchasers and non-purchasers of a PERS and to explore the population of users and non-users of these devices.

METHODS: The study was part of an observational cohort survey of elderly fallers which took place in the emergency department of our University urban hospital.

RESULTS: 413 patients were included. 115 of them were purchasers of a PERS, presented a lower index of independence in daily activities, greater fall history and a tendency to live alone. Only 18 purchasers used their PERS to alert and they were significantly more likely to live alone, showed a trend to be younger and less demented. This subgroup spent less time on the ground and with a lower 6-months mortality.

CONCLUSIONS: The subjects who had and had not purchased a PERS presented no significant differences in terms of time on the ground or consequences. However it was more relevant to focus on the users and non-users of those PERS to isolate a frailer population. Indeed the consequences of falls were more devastating in the group of purchasers who had not used their device to alert. This group may benefit the most from new generations of PERS which do not require control by the subject.

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Reliability of inertial sensors in the assessment of patients with vestibular disorders: a feasibility study

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Abstract

BACKGROUND: Vestibular disorders affect an individual's stability, balance, and gait and predispose them to falls. Traditional laboratory-based semi-objective vestibular assessments are intrusive and cumbersome provide little information about their functional ability. Commercially available wearable inertial sensors allow us to make this real life assessments objective, with a detailed view of their functional abilities. Timed Up and Go (TUG) and Postural Sway tests are commonly used tests for gait and balance assessments. Our aim was to assess the feasibility, test-retest reliability and ability to classify fall status in individuals with vestibular disorders using parameters derived from the commercially available wearable system (inertial sensors and the Mobility Lab Software, APDM, Inc.).

METHODS: We recruited 27 individuals diagnosed either with unilateral or bilateral vestibular loss on vestibular function testing. Instrumented Timed Up and Go (iTUG) and Postural Sway (iSway) were administered three times during the first session and then repeated at a similar time the following week. To evaluate within and between sessions reliability of the parameters the Intra-Class Correlation coefficient (ICC) was used. Subsequently, the ability of reliable parameters ($ICC \geq 0.8$) to classify fallers from non-fallers was estimated.

RESULTS: The iTUG test parameters showed good within and between sessions' reliability with mean ICC (between-sessions) values of 0.81 ± 0.17 and 0.69 ± 0.15 , respectively. For the iSway test, the relative figures were; 0.76 ± 0.13 and 0.71 ± 0.14 , respectively. A retrospective falls classification analysis with past 12 months falls history data yielded an accuracy of 66.70% with an area under the curve of 0.79. Mean Distance from centre of COP (mm) of accelerometer's trajectory (m/s^2) from the iSway test was the only significant parameter to classify fallers from non-fallers.

CONCLUSIONS: Using a commercially available wearable system a subset of reliable iTUG and iSway parameters were identified and their ability to classify fallers were estimated. These parameters have potential to augment assessments of vestibular patients to enable clinicians and therapists to provide objective, tailored, personalised interventions for their gait and postural control and also to objectively evaluate and monitor the efficiency of their interventions.

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