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Ankle proprioception associated gait patterns in older adults: results from the BLSA

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DOI 10.1249/MSS.0000000000001017 **PMID** 27327030

Abstract

INTRODUCTION: Ankle proprioception training has been found to improve balance-related gait disorders; yet, the relationship between ankle proprioception and specific gait patterns in older adults with and without impaired balance has not been systematically examined.

METHODS: This study characterizes gait patterns of 230 older adults aged 60 - 95 evaluated in the Baltimore Longitudinal Study of Aging (BLSA) gait laboratory with (n=82) and without impaired balance (inability to successfully complete a narrow walk) and examines ankle proprioception performance.

RESULTS: Participants with impaired balance had a higher angle threshold for perceiving ankle movement than those without impaired balance even after controlling for the substantial age difference between groups ($p = 0.017$). Gait speed, stride length, hip and ankle range of motion and mechanical work expenditure from the knee and ankle were associated with ankle proprioception performance ($p < 0.050$ for all) in the full sample, but in stratified analysis these associations were evident only in participants with impaired balance.

CONCLUSION: Ankle proprioception in older persons with balance impairment may play a role in balance related gait disorders and should be targeted for intervention.

PDF Y Endnote Y

Are older adults receiving evidence-based advice to prevent falls post-discharge from hospital?

Lee DCA, Brown T, Stolwyk R, O'Connor DW, Haines TP.

Health Educ. J. 2016; 75(4): 448-463.

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DOI 10.1177/0017896915599562 **PMID** unavailable

Abstract

BACKGROUND: Older adults experience a high rate of falls when they transition to community-living following discharge from hospital.

OBJECTIVES: To describe the proportion of older adults who could recall having discussed falls and falls prevention strategies with a health professional within 6 months following discharge from hospital. To describe the recalled content of these discussions and the strategies recommended and/or undertaken to prevent falls.

METHODS: Prospective cohort study of 155 older adults surveyed prior to discharge from hospital, of whom 123 were followed up at month 3 and/or month 6 in the community post-discharge.

Participants were recruited from three Australian hospitals. Questionnaires captured predictive factors that may predispose to a fall and data related to the objectives being examined.

RESULTS: Of the 123 participants who had at least one follow-up, 54 reported discussing falls with a health professional (49 discussed falls with their general practitioners). Of the 54 participants who recalled having a discussion, 33 commented that they were asked whether they had fallen over. Only six discussed interventions to prevent falls. However, 44 stated that they attempted a total of 53 strategies to prevent falls post-discharge. Of these strategies, 40 had an absence of evidence of effectiveness, 11 had evidence of effectiveness, while two had either evidence of no benefit/harm or evidence of harm for the prevention of falls. In all, 53 participants reported falling post-discharge, but 42% of them did not recall discussing falls with their health professional.

CONCLUSION: There is considerable scope for health professionals, especially general practitioners, to increase the frequency with which they discuss falls and evidence-based interventions to prevent falls in this population.

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Comparison of frailty phenotypes for prediction of mortality, incident falls, and hip fracture in older women

Zaslavsky O, Zelber-Sagi S, Gray SL, Lacroix AZ, Brunner RL, Wallace RB, O'Sullivan MJ, Cochrane B, Woods NF.

J. Am. Geriatr. Soc. 2016; ePub(ePub): ePub.

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Abstract

OBJECTIVES: To compare the ability of the commonly used Women's Health Initiative (WHI) and Cardiovascular Health Study (CHS) frailty phenotypes to predict falls, hip fracture, and death in WHI Clinical Trial participants aged 65 and older.

DESIGN: Longitudinal cohort study.

SETTING: WHI Clinical Trial.

PARTICIPANTS: Participants with data for WHI and CHS frailty phenotypes (N = 3,558).

MEASUREMENTS: Frailty was operationally defined in the CHS as the presence of three or more of weight loss, poor energy, weakness, slowness, and low physical activity. WHI operationalized frailty similarly but with the RAND-36 physical function scale substituted for slowness and weakness (RAND-36 physical function scale score <13 = 2 points, 13-78 = 1 point, >78 = 0 points). Frailty was defined as a summary score of 3 or greater, prefrailty as a score of 2 or 1, and nonfrailty as a score of 0. Outcomes were modeled using Cox regression. Harrell C-statistics were compared for models containing alternative instruments.

RESULTS: Approximately 5% of participants were frail based on the CHS or WHI phenotype. The WHI frailty phenotype was associated with higher rates of falls (hazard ratio (HR) = 1.48, P = .003), hip fracture (HR = 1.87, P = .04), and death (HR = 2.32, P < .001). Comparable HRs in CHS-phenotype frail women were 1.32 (P = .04), 1.08 (P = .83), and 1.91 (P < .001), respectively. Harrell C-statistics revealed marked but insignificant differences in predicting abilities between CHS and WHI phenotype models (P > .50 for all).

CONCLUSION: The WHI phenotype, which does not require direct measurements of physical performance, might offer a practical advantage for epidemiological and clinical needs.

PDF Y Endnote Y

Cost-benefit analysis of fall injuries prevented by a programme of home modifications: a cluster randomised controlled trial

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Inj. Prev. 2016; ePub(ePub): ePub.

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DOI 10.1136/injuryprev-2015-041947 **PMID** 27312961

Abstract

BACKGROUND: Injuries due to falls in the home impose a huge social and economic cost on society. We have previously found important safety benefits of home modifications such as handrails for steps and stairs, grab rails for bathrooms, outside lighting, edging for outside steps and slip-resistant surfacing for outside areas such as decks. Here we assess the economic benefits of these

modifications.

METHODS: Using a single-blinded cluster randomised controlled trial, we analysed insurance payments for medically treated home fall injuries as recorded by the national injury insurer. The benefits in terms of the value of disability adjusted life years (DALYs) averted and social costs of injuries saved were extrapolated to a national level and compared with the costs of the intervention.

RESULTS: An intention-to-treat analysis was carried out. Injury costs per time exposed to the modified homes compared with the unmodified homes showed a reduction in the costs of home fall injuries of 33% (95% CI 5% to 49%). The social benefits of injuries prevented were estimated to be at least six times the costs of the intervention. The benefit-cost ratio can be at least doubled for older people and increased by 60% for those with a prior history of fall injuries.

CONCLUSIONS: This is the first randomised controlled trial to examine the benefits of home modification for reducing fall injury costs in the general population. The results show a convincing economic justification for undertaking relatively low-cost home repairs and installing safety features to prevent falls. TRIAL REGISTRATION NUMBER: ACTRN12609000779279.

PDF Y Endnote Y

Effectiveness of chiropractic care to improve sensorimotor function associated with falls risk in older people: a randomized controlled trial

Holt KR, Haavik H, Lee AC, Murphy B, Elley CR.

J. Manipulative Physiol. Ther. 2016; 39(4): 267-278.

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Abstract

OBJECTIVE: This study assessed whether 12 weeks of chiropractic care was effective in improving sensorimotor function associated with fall risk, compared with no intervention, in community-dwelling older adults living in Auckland, New Zealand.

METHODS: Sixty community-dwelling adults older than 65 years were enrolled in the study. Outcome measures were assessed at baseline, 4 weeks, and 12 weeks and included proprioception (ankle joint position sense), postural stability (static posturography), sensorimotor function (choice stepping reaction time), multisensory integration (sound-induced flash illusion), and health-related quality of life (SF-36).

RESULTS: Over 12 weeks, the chiropractic group improved compared with the control group in choice stepping reaction time (119 milliseconds; 95% confidence interval [CI], 26-212 milliseconds; $P = .01$) and sound-induced flash illusion (13.5%; 95% CI, 2.9%-24.0%; $P = .01$). Ankle joint position sense improved across the 4- and 12-week assessments (0.20°; 95% CI, 0.01°-0.39°; $P = .049$).

Improvements were also seen between weeks 4 and 12 in the SF-36 physical component of quality of life (2.4; 95% CI, 0.04-4.8; $P = .04$) compared with control.

CONCLUSION: Sensorimotor function and multisensory integration associated with fall risk and the physical component of quality of life improved in older adults receiving chiropractic care compared with control. Future research is needed to investigate the mechanisms of action that contributed to the observed changes in this study and whether chiropractic care has an impact on actual falls risk in older adults.

PDF Y Endnote Y

Fall-related psychological concerns and anxiety among community-dwelling older adults: systematic review and meta-analysis

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Abstract

Fear of falling and other fall-related psychological concerns (FRPCs), such as falls-efficacy and balance confidence, are highly prevalent among community-dwelling older adults. Anxiety and FRPCs have frequently, but inconsistently, been found to be associated in the literature. The purpose of this study is to clarify those inconsistencies with a systematic review and meta-analysis and to evaluate if the strength of this relationship varies based on the different FRPC constructs used (e.g., fear of falling, falls-efficacy or balance confidence). A systematic review was conducted through multiple databases (e.g., MEDLINE, PsycINFO) to include all articles published before June 10th 2015 that measured anxiety and FRPCs in community-dwelling older adults. Active researchers in the field were also contacted in an effort to include unpublished studies. The systematic review led to the inclusion of twenty relevant articles ($n = 4738$). A random-effect meta-analysis revealed that the mean effect size for fear of falling and anxiety is $r = 0.32$ (95% CI: 0.22-0.40), $Z = 6.49$, $p < 0.001$ and the mean effect size for falls-efficacy or balance confidence and anxiety is $r = 0.31$ (95% CI: 0.23-0.40), $Z = 6.72$, $p < 0.001$. A Q-test for heterogeneity revealed that the two effect sizes are not significantly different ($Q(19) = 0.13$, $p = n.s.$). This study is the first meta-analysis on the relationship between anxiety and FRPCs among community-dwelling older adults. It demonstrates the importance of considering anxiety when treating older adults with FRPCs.

PDF Y Endnote Y

Fear of falling as a risk factor of mobility disability in older people at five diverse sites of the IMIAS study

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Abstract

BACKGROUND: Fear of falling (FoF) is a common health problem among older adults. Although the relationship between FoF and limitation in daily activities has been reported, FoF's relationship to mobility disability, a transitional phase to end-stage disability, is not yet understood. We examined the relationship between FoF and mobility disability among community-dwelling older adults and explored the differences in this relationship among socio-culturally diverse sites.

DESIGN: Cross-sectional study.

SETTING: Community.

PARTICIPANTS: 1875 participants (65-74 years) were recruited from five sites and included in the analysis (Kingston, Canada: 394; St-Hyacinthe, Canada: 397; Tirana, Albania: 359; Manizales, Colombia: 341; and Natal, Brazil: 384).

MEASUREMENT: FoF was quantified using the Falls Efficacy Scale-International (FES-I, range: 16-64). Mobility disability was defined as difficulty climbing a flight of stairs or walking 400m without assistance.

RESULTS: Overall, 21.5% of participants reported high FoF (FES-I>27). The average FoF scores were significantly different between the sites ($p < 0.001$) and higher in women ($p < 0.001$). In general, 36.2% of participants reported mobility disability. The distribution of mobility disability was significantly different at the five study sites (ranged from 19.8% at Kingston, Canada to 50.7% at Tirana, Albania, $p < 0.001$). After adjusting for covariates, those with high and moderate FoF had about 3 times (95% CI: 2.59-3.83) and 2.5 times (95% CI: 1.99-2.91) higher risk of mobility disability, respectively, compared to those with no/low FoF.

CONCLUSIONS: FoF was significantly associated with risk of mobility disability across the sites. The strength of this relationship appears to be different between the five sites.

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Interventions incorporating physical and cognitive elements to reduce falls risk in cognitively impaired older adults

Booth V, Hood V, Kearney F.

JBI Database Syst. Rev Implement. Rep. 2016; 14(5): 110-135.

(Copyright © 2016, Joanna Briggs Institute)

DOI 10.11124/JBISRI-2016-002499 PMID unavailable

Abstract

BACKGROUND: Cognitive impairment is a risk factor for falls. Older adults with cognitive impairment (such as dementia) have an increased risk of falling compared with age-matched individuals without a cognitive impairment. To reduce falls in this population, interventions could theoretically target and train both physical and cognitive abilities. Combining and addressing cognitive components in falls rehabilitation is a novel and emerging area of healthcare.

OBJECTIVES: The objective of this review was to identify the effectiveness of combined cognitive and physical interventions on the risk of falls in cognitively impaired older adults.

INCLUSION CRITERIA TYPES OF PARTICIPANTS: Older persons who were 65 years or older and identified as having a cognitive impairment either through diagnosis or assessment of global cognition.

TYPES OF INTERVENTION(S): Multifactorial or multiple interventions where physical and cognitive elements were combined was compared against standard care or a single element intervention.

TYPES OF STUDIES: Randomized controlled trials (RCTs), controlled clinical trials and experimental studies in which randomization was used.

OUTCOMES: Outcomes related to falls, including falls rate, specific falls risk measures (i.e. Physiological Profile Assessment) or related clinical outcome measures (i.e. Timed Up and Go test, Tinetti and gait speed).

SEARCH STRATEGY: A three-step search strategy was utilized in this review, including search of electronic databases: CENTRAL, JBISRI, MEDLINE, EMBASE, AMED, CINAHL and PsychINFO. Initial keywords used were dementia, cognitive impairment, memory loss, exercise, rehabilitation and accidental falls. Grey literature (Google Scholar) and trials registers (Current Controlled Trials) searches were also completed.

METHODOLOGICAL QUALITY: The methodological quality of included studies was assessed using Joanna Briggs Institute Meta-Analysis of Statistics Assessment and Review Instrument (JBI-MAStARI) software.

DATA EXTRACTION: Data was extracted from articles included in the review using the standardized data extraction tool from JBI-MAStARI.

DATA SYNTHESIS: A quantitative meta-analysis was performed where possible. Otherwise, data synthesis was in the form of narrative review. Sub-group analysis according to level of cognitive impairment was completed where possible.

RESULTS: Eight RCTs were included in this review; they evaluated the effectiveness of multicomponent exercise programs, including physical and cognitive activities, music-based group exercise and mind-body tai chi on falls related outcomes. Most of the studies were of good quality with an average quality score of 7.5. Four studies reported effectiveness based on the number of falls, half of which reported a significant difference between the groups, but pooling of results into meta-analysis was not possible because of differences in reporting of the outcome. Falls related outcomes that were combined in meta-analysis included balance (Berg balance scale), functional mobility (Timed Up and Go) and gait speed (m/s). There was a statistically significant improvement in balance and gait speed following the intervention; however, the studies were too heterogeneous to be included in the analysis from the functional mobility results.

CONCLUSION: Overall, multicomponent interventions incorporating both physical and cognitive components demonstrated positive effects on balance, functional mobility and gait speed when compared with a control and had significantly better effect on balance and gait speed within mild cognitive impairment populations.

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Motor skills enhance procedural memory formation and protect against age-related decline

Müller NC, Genzel L, Konrad BN, Pawlowski M, Neville D, Fernández G, Steiger A, Dresler M.

PLoS One 2016; 11(6): e0157770.

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Abstract

The ability to consolidate procedural memories declines with increasing age. Prior knowledge enhances learning and memory consolidation of novel but related information in various domains. Here, we present evidence that prior motor experience—in our case piano skills—increases procedural learning and has a protective effect against age-related decline for the consolidation of novel but related manual movements. In our main experiment, we tested 128 participants with a sequential finger-tapping motor task during two sessions 24 hours apart. We observed enhanced online learning speed and offline memory consolidation for piano players. Enhanced memory consolidation was driven by a strong effect in older participants, whereas younger participants did not benefit significantly from prior piano experience. In a follow up independent control experiment, this compensatory effect of piano experience was not visible after a brief offline period of 30 minutes, hence requiring an extended consolidation window potentially involving sleep. Through a further control experiment, we rejected the possibility that the decreased effect in younger participants was caused by training saturation. We discuss our results in the context of the neurobiological schema approach and suggest that prior experience has the potential to rescue memory consolidation from age-related cognitive decline.

PDF Y Endnote Y

Prevalence and incidence of frailty in community-dwelling older people: Beijing Longitudinal Study of Aging II

Zheng Z, Guan S, Ding H, Wang Z, Zhang J, Zhao J, Ma J, Chan P.

J. Am. Geriatr. Soc. 2016; 64(6): 1281-1286.

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(Copyright © 2016, John Wiley and Sons)

DOI 10.1111/jgs.14135 **PMID** 27321607

Abstract

OBJECTIVES: To estimate the prevalence and incidence of frailty and evaluate the effect of frailty on adverse outcomes in Chinese elderly adults.

DESIGN: Secondary analysis of prospective cohort study.

SETTING: Community in Beijing, China.

PARTICIPANTS: Individuals aged 55 and older (N = 10,039).

MEASUREMENTS: A Frailty Index (FI) was derived from 34 items using Rockwood's cumulative deficits method. A FI of 0.25 or greater indicated frailty. The clinical outcome was evaluated using a composite variable of any of the following adverse events: falls, hospitalization, activity of daily living disability, and death.

RESULTS: The overall crude prevalence of frailty was 12.3% (95% confidence interval (CI) = 11.7-13.0%), and the standardized prevalence was 9.1% (95% CI = 8.6-9.7%). The crude incidence was 13.0% (95% CI = 12.2-13.9%), and the standardized incidence 10.8% (95% CI = 10.0-11.6%).

Prevalence and incidence were significantly greater with age (P for trend $<.001$) and greater in women ($P < .001$) and urban residents ($P < .001$). Participants with lower education and having three or more diseases and taking four or more medications daily were more likely to develop frailty over follow-up (all $P < .05$). After adjusting for age, number of diseases, and smoking at baseline, the risk of any adverse event in 1 year in the frail group was 58% higher than in the nonfrail group (adjusted odds ratio = 1.58, 95% CI = 1.30-1.93, $P < .001$).

CONCLUSION: A feasible FI that can be used in routine medical evaluation in a primary care setting was developed, and a 12.3% prevalence and a 13% incidence of frailty was demonstrated in community-dwelling Chinese older adults. Frailty is more common for urban and female residents in the oldest old group. Being frail significantly predicts geriatric adverse outcomes, indicating the importance of early screening and intervention in frail individuals in primary care.

PDF Y Endnote Y

Quality of Austrian and Dutch falls-prevention information: a comparative descriptive study

Schoberer D, Mijnaerends DM, Fliedner M, Halfens RJG, Lohrmann C.

Health Educ. J. 2016; 75(2): 220-234.

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DOI 10.1177/0017896915573045 **PMID** unavailable

Abstract

OBJECTIVES: The aim of this study was to evaluate and compare the quality of written patient information material available in Austrian and Dutch hospitals and nursing homes pertaining to falls prevention.

DESIGN: Comparative descriptive study design

SETTING: Hospitals and nursing homes in Austria and the Netherlands.

METHOD: Written patient information material ($n = 77$) was independently evaluated by two assessors using the 36-item Ensuring Quality Information for Patients (EQIP) scale with regard to content, structure and identification data. EQIP global scores were calculated and country- and institution-specific (hospitals and nursing homes) differences were analysed.

RESULTS: The written patient information material available in Dutch hospitals had a significantly higher EQIP mean score than that in Austrian hospitals ($p <.0001$). The difference in EQIP global score between the countries was not significant for the written patient information material in nursing homes ($p = .479$). Sub-scale analyses indicated that Dutch institutions reached significantly higher mean values in the global scores for content and structure than Austrian ones ($p <.05$).

CONCLUSION: Although Dutch written patient information material pertaining to falls prevention was of higher quality than that in Austria, both countries suffered from shortcomings, especially with regard to content and identification data. Authors of written patient information material face a great challenge in taking consumer involvement and evidence-based criteria into account.

PDF Y Endnote Y

Recognition of falls using dense sensing in an ambient assisted living environment

Wickramasinghe A, Torres RLS, Ranasinghe DC.

Pervasive Mob. Comput. 2016; ePub(ePub): ePub.

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Abstract

Long-lie situations following a fall is detrimental, particularly for older people as they are not only affected physically but also psychologically. In this paper, we describe a dense sensing approach for falls detection in an ambient assisted living environment such as a room, hall or a walkway. We utilize a smart carpet consisting of an array of Radio Frequency Identification (RFID) tags arranged in a 2-dimensional grid to create an unobtrusive monitoring area and to detect falls among other

activities. In particular, we propose an algorithm based on heuristic and machine learning to detect 'long-lie' situations. The proposed algorithm minimizes the effects of noise present in the RFID information by relying on 8 features extracted using only binary tag observation information from a possible location of a fall on the smart carpet. By evaluating the proposed approach with broadly scripted activities, which included a complex set of walking patterns, we show that the proposed algorithm depicted a good overall performance of 93% F-score.

PDF Y Endnote Y

Relationship between difficulties in daily activities and falling: loco-check as a self-assessment of fall risk

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Interact. J. Med. Res. 2016; 5(2): e20.

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(Copyright © 2016, JMIR Publications)

DOI 10.2196/ijmr.5590 **PMID** 27323871

Abstract

BACKGROUND: People aged 65 years or older accounted for 25.1% of the Japanese population in 2013, and this characterizes the country as a "super-aging society." With increased aging, fall-related injuries are becoming important in Japan, because such injuries underlie the necessity for nursing care services. If people could evaluate their risk of falling using a simple self-check test, they would be able to take preventive measures such as exercise, muscle training, walking with a cane, or renovation of their surroundings to remove impediments. Loco-check is a checklist measure of early locomotive syndrome (circumstances in which elderly people need nursing care service or are at high risk of requiring the service within a short time), prepared by the Japanese Orthopaedic Association (JOA) in 2007, but it is unclear if there is any association between this measure and falls. **OBJECTIVE:** To investigate the association between falls during the previous year and the 7 "loco-check" daily activity items and the total number of items endorsed, and sleep duration.

METHODS: We conducted an Internet panel survey. Subjects were 624 persons aged between 30 and 90 years. The general health condition of the participants, including their experience of falling, daily activities, and sleep duration, was investigated. A multivariate analysis was carried out using logistic regression to investigate the relationship between falls in the previous year and difficulties with specific daily activities and total number of difficulties (loco-check) endorsed, and sleep duration, adjusting for sex and age.

RESULTS: One-fourth of participants (157 persons) experienced at least one fall during the previous year. Fall rate of females (94/312: 30.1%) was significantly higher than that of males (63/312: 20.2%). Fall rate of persons aged more than 65 years (80/242: 33.1%) was significantly higher than that of younger persons (77/382: 20.2%). Logistic regression analysis revealed that daily activities such as "impossibility of getting across the road at a crossing before the traffic light changes" are significantly related to falling. Logistic regression analysis also demonstrated a relationship between the number of items endorsed on loco-check and incidence of falling, wherein persons who endorsed 4 or more items appear to be at higher risk for falls. However, logistic regression found no significant relationship between sleep duration and falling.

CONCLUSIONS: Our study demonstrated a relationship between the number of loco-check items endorsed and the incidence of falling in the previous year. Endorsement of 4 or more items appeared to signal a high risk for falls. The short self-administered checklist can be a valuable tool for assessing the risk of falling and for initiating preventive measures.

PDF Y Endnote Y

Relationship between perceived risk of falling and adoption of precautions to reduce fall risk

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J. Am. Geriatr. Soc. 2016; 64(6): 1313-1317.

Affiliation Injury Prevention Research Center, University of Iowa, Iowa City, Iowa.

(Copyright © 2016, John Wiley and Sons)

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Abstract

OBJECTIVES: To better understand the relationship between perceived risk of falling and awareness and adoption of four specific precautions that older adults have taken to reduce this risk.

DESIGN: Cross-sectional.

SETTING: Data were collected in in-person interviews conducted in the homes of study participants. Interviews conducted between March 2011 and September 2013 and lasted an average of 60-90 minutes.

PARTICIPANTS: A stratified sampling strategy designed to enroll an equal number of homebound and nonhomebound participants was used. All participants (N = 164) were recruited from central North Carolina.

MEASUREMENTS: Participants were asked about 1-year fall history, perceived risk of falling, restriction of activities because of fear of falling, awareness of four recommended fall prevention behaviors (exercise, annual medication review, bathroom grab bars, safe footwear), and current practice of these behaviors.

RESULTS: In bivariate analyses, individuals who were aware of two behaviors recommended to reduce the risk of falling (exercise, use of safe footwear) and had adopted these behaviors perceived their risk of falling as lower than individuals who were aware of the recommended behaviors but had not adopted them. Moreover, in multivariate analyses, individuals who did not know that exercise is recommended to reduce the risk of falling perceived their risk of falling as lower than those who were aware of this recommendation and had adopted it. Individuals were least likely to be aware that medication reviews and exercise are recommended to reduce fall risk.

CONCLUSION: Awareness of behaviors recommended to reduce fall risk appears necessary for adoption of these behaviors to reduce perceived risk. Fall-prevention campaigns should emphasize behaviors where awareness is low.

PDF Y Endnote Y

The application of IMPACT prognostic models to elderly adults with traumatic brain injury: a population-based observational cohort study

Staples JA, Wang J, Zaros MC, Jurkovich GJ, Rivara FP.

Brain Inj. 2016; 30(7): 899-907.

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Abstract

OBJECTIVE: To examine the performance of the International Mission for Prognosis and Clinical Trial Design in Traumatic Brain Injury (IMPACT) prognostic models in older patients.

METHODS: Using data from the National Study on Costs and Outcomes of Trauma (NSCOT), this study identified adult patients presenting to US hospitals in 2001 and 2002 with non-penetrating moderate or severe traumatic brain injury (GCS \leq 12). IMPACT model calibration and discrimination in the older stratum (65-84 years) was compared to that in the younger stratum (18-64 years).

RESULTS: IMPACT model discrimination did not differ significantly between the older (n = 202; weighted n = 268) and younger strata (n = 613; weighted n = 1632) and was generally adequate (c-statistic for the core-death model = 0.81 [0.77-0.84] vs 0.75 [0.66-0.84], respectively; p = 0.26).

IMPACT model calibration was poor for both older and younger strata (Hosmer-Lemeshow p-value for the core-death model = 0.01 vs < 0.0001, respectively). Pre-specified qualitative graphical

evaluation suggested substantial under-prediction of mortality in the oldest decades of life, but not among younger patients.

CONCLUSIONS: The examined IMPACT prognostic models demonstrated adequate discrimination and poor calibration in both older and younger patients, yet particular caution may be required when applying these models to the elderly.

PDF Y Endnote Y

A randomized, embedded trial of pre-notification of trial participation did not increase recruitment rates to a falls prevention trial

Arundel C, Jefferson L, Bailey M, Cockayne S, Hicks K, Loughrey L, Rodgers S, Torgerson DJ.
J. Eval. Clin. Pract. 2016; ePub(ePub): ePub.

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Abstract

OBJECTIVES: To design and evaluate the effectiveness of a pre-notification leaflet about research to increase recruitment to a randomized controlled trial (RCT).

METHODS: A methodological, two-arm, RCT was conducted, embedded within an existing cohort RCT (REFORM). Participants were randomized for the embedded trial, using a 1:2 ratio (intervention : control) before being randomized for REFORM. Controls received a trial recruitment pack. The intervention group received an additional pre-notification leaflet 2-3 weeks before the recruitment pack. Primary and secondary analyses were conducted using relative risk, the Cox proportional hazards model and incremental cost-effectiveness ratios.

RESULTS: Of the 1436 intervention group participants, 73 (5.1%) were randomized into the REFORM trial compared with 126 (4.4%) of the 2878 control group participants. The associated relative risk (1.16) was not statistically significant [95% confidence interval (CI) 0.88-1.56]. Return rate was not significantly increased (relative risk 1.10, 95% CI 0.92-1.28) nor time to return decreased (hazard ratio: 1.11, 95% CI 0.93-1.33). Incremental cost-effectiveness ratios indicated the intervention may be cost-effective if the true estimate of effect was close to the upper bound of the associated 95% CI.

CONCLUSION: Pre-notification for potential trial participants demonstrated a small difference to randomization (0.7% difference) and return rates (1.1% difference) in favour of the intervention. Results should, however, be interpreted with caution as CIs for these estimates cross the point of no effect. Nevertheless, this research enhances existing evidence for pre-notification to increase recruitment rates, with further development and assessment of this potentially cost-effective intervention being recommended.

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An interdisciplinary approach to fall prevention in a high-risk inpatient pediatric population: a quality improvement project

Stubbs KE, Sikes L.

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Abstract

BACKGROUND: Within a tertiary-care pediatric medical center, the largest number of inpatient falls (8.84 falls per 1000 patient days) occurred within a 14-bed rehabilitation/ transitional care unit between February and September 2009. An interdisciplinary fall prevention program, Red Light, Green Light, was developed to better educate all staff and family members to ensure safety of transfers and ambulation of neurologically impaired children.

PURPOSE: The purpose was to develop and implement an interdisciplinary pediatric fall prevention

program to reduce total falls and falls with family members of this population.

DATA SOURCES: Pre-intervention 2009 data and longitudinal data from 2010-2014 were obtained from retrospective review of event/incident reports.

Event Identification This quality improvement project was based on inpatient pediatric admissions to a rehabilitation care unit accommodating neurologically impaired children.

DATA EXTRACTION: Data extraction included: total falls, falls with caregiver (alone vs. staff vs. family), type of falls, and falls by diagnosis.

DATA SYNTHESIS: Descriptive statistics were obtained on outcome measures; chi-squares were calculated on pre- and post-intervention comparisons. Total falls decreased steadily from 8.84 falls per 1000 patient days in 2009 to 1.79 falls per 1000 patient days in 2014 ($\chi^2(1) = 3.901, p=0.048$). Falls with family members decreased 50% post intervention ($\chi^2(1) = 6.26, p=0.012$)

LIMITATIONS: Limitations include: unit size nearly doubled post-intervention, event reporting changed to both uncontrolled and controlled therapy falls (safely lowering patient to bed, chair, or floor), and enhanced reporting increased numbers of post-intervention falls.

CONCLUSIONS: Red Light, Green Light has resulted in reductions in overall fall rates, falls with family members, increased staff collaboration, heightened staff and family safety awareness, and a safer environment for high-risk patients.

PDF Y Endnote Y

Audiology patient fall statistics and risk factors compared to non-audiology patients

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Int. J. Audiol. 2016; ePub(ePub): ePub.

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Abstract

OBJECTIVE: To compare fall statistics (e.g. incidence, prevalence), fall risks, and characteristics of patients who seek hearing healthcare from an audiologist to individuals who have not sought such services.

DESIGN: Case-control study.

STUDY SAMPLE: Two groups of community-dwelling older adult patients: 25 audiology patients aged 60 years or older (M age: 69.2 years, SD: 4.5, range: 61-77) and a control group (gender- and age-matched ± 2 years) of 25 non-audiology patients (M age: 69.6, SD: 4.7, range: 60-77).

RESULTS: Annual incidence of falls (most recent 12 months) was higher in audiology patients (68.0%) than non-audiology patients (28.0%; $p = .005$). Audiology patients reported a higher incidence of multiple recent falls ($p = .025$) and more chronic health conditions ($p = .028$) than non-audiology patients.

CONCLUSIONS: Significantly more audiology patients fall on an annual basis than non-audiology patients, suggesting that falls are a pervasive issue in general hearing clinics. Further action on the part of healthcare professionals providing audiologic services may be necessary to identify individuals at risk for falling.

PDF Y Endnote Y

Evaluation of a fall risk prediction tool using large-scale data

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Abstract

To support nursing care for the prevention of falls among inpatients at our institution, we developed and implemented a fall risk prediction tool. To evaluate its effectiveness, we compared the number of falls among inpatients before and after its implementation. The odds ratio for the probability of falling was 0.79 (95% confidence interval: 0.69-0.91) ($p < 0.001$), which was adjusted based on institutional data comprising 573,216 records from 25,039 patients in 24 general wards. Although whether nurses used the tool completely or whether the dissemination of fall prevention measures led to behavioral changes among the nurses in relation to their care remained unclear, the fall risk of inpatients appeared to be reduced after implementation of the prediction tool.

PDF Y Endnote Y

Exploration of risk factors for falls using electronic nursing records

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Stud. Health Technol. Inform. 2016; 225: 637-638.

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Abstract

INTRODUCTION: The purpose was to identify fall risk factors between admission day and fall occurred day using electronic nursing records and the Morse Fall Scale (MFS).

METHODS: The MFS and fall related data were obtained through retrospective chart review from June 1, 2014 to May 31, 2015. Descriptive statistics and McNemar test were used for statistical tests.

RESULTS: Fall was evaluated in 447 events, 16 patients experienced recurrent fall. Pain, emotional distress, urinary problems and fever were significant differences between admission day and fall occurred day. There were explored significant MFS risk factors in risk group, history of falling, second diagnosis, IV catheter status, medication concerning fall risk, mental status, general weakness and gait in MFS subscales.

DISCUSSION: Routine fall screening is important for early detection of fall. Identification of high-risk group and using fall prevention guidelines could improve prevention of fall.

PDF Y Endnote Y

Stepping strategy used to recover balance during an induced fall is associated with impaired function and strength in people with knee osteoarthritis

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Abstract

AIM: We investigated differences in function, strength and pain in those with knee osteoarthritis (OA) who responded with a single step compared to multiple steps during balance recovery during an induced forward fall.

METHOD: The stepping response of 24 participants with knee OA (50% female, age 68.6 ± 6.2 years) as they recovered balance from an induced forward fall was recorded. Participants were grouped based on their stepping response as single-stepper and multi-stepper. Comparison was made between the groups for functional and strength tests and self-reported pain, function, quality of life, fear of falls and physical activity.

RESULTS: Fourteen of the participants (58%) responded with a multiple step response. Multiple steppers demonstrated greater time for the up and go ($P = 0.01$), the stair climb tests ($P = 0.05$), as well as reduced distance during the 2 min walk test ($P = 0.001$) and reduced isokinetic knee

extension strength ($P = 0.02$).

CONCLUSION: Those who demonstrated multiple step response had impaired function, reduced strength and were less physically active. Given the high prevalence of falls in people with knee OA, further studies are required to better understand the ability of people with knee OA to respond and avoid falls.

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