

### SafetyLit February 11, 2017

#### **Advanced dementia in long-term care: avoiding the pitfalls of fall prevention**

Metzger ED, Racine AM, Inouye SK.

*Am. J. Geriatr. Psychiatry* 2017; ePub(ePub): ePub.

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**DOI** 10.1016/j.jagp.2017.12.007 **PMID** 29398352

**Abstract** [Abstract unavailable]

**PDF Y Endnote Y**

#### **Age-dependent changes in dynamic standing-balance ability evaluated quantitatively using a stabilometer**

Suzuki Y, Yatoh S, Suzuki H, Tanabe Y, Shimizu Y, Hada Y, Shimano H.

*J. Phys. Ther. Sci.* 2018; 30(1): 86-91.

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(Copyright © 2018, Society of Physical Therapy Science)

**DOI** 10.1589/jpts.30.86 **PMID** 29410573 **PMCID** PMC5788782

#### **Abstract**

**PURPOSE:** The efficacy of a stabilometer-based index of postural stability (IPS) as an indicator of dynamic balance ability was investigated.

**SUBJECTS AND METHODS:** Using a stabilometer, we calculated the IPS in 583 healthy subjects (178 males, 405 females) under two conditions (open eyes/hard surface, OE/HS; closed eyes/soft surface, CE/SS).

**RESULTS:** Results revealed a negative relation between IPS and age. IPS (OE/HS) began to decrease at middle-age (40-60 years old), and then decreased more rapidly during elderly ages (>60 years old). On the other hand, IPS (CE/SS) decreased linearly with increasing age. There was no gender difference between the two IPSs.

**CONCLUSION:** These results suggest that IPS can evaluate balance ability quantitatively and without a ceiling effect. It was concluded that IPS (OE/HS) indicates comprehensive balance ability, while IPS (CE/SS) reveals balance ability without compensation by visual acuity and plantar superficial sense.

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#### **Application of a geriatric injury protocol demonstrates high survival rates for geriatric trauma patients with high injury acuity**

Karamanukyan T, Pakula A, Martin M, Francis A, Skinner R.

*Am. Surg.* 2017; 83(10): 1122-1126.

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(Copyright © 2017, Southeastern Surgical Congress)

**DOI** unavailable **PMID** 29391108

#### **Abstract**

Geriatric trauma has historically been associated with poor outcomes, particularly in the setting of severe polytrauma. Although geriatric trauma protocols are common, there are limited data on their

impact in patients with high injury severity. In this study, we sought to investigate the impact of a geriatric injury protocol on outcomes in patients with severe trauma acuity. Ninety-eight geriatric patients (age  $\geq 65$ ) admitted to our trauma center with injury severity scores (ISS)  $\geq 15$  comprised the study cohort. The mean age was  $75 \pm 7.7$  yrs. The mean ISS was  $25 \pm 9.2$ , and the mean geriatric trauma outcome score was  $150 \pm 3$ . Mortality was 17 per cent and 70 per cent were due to central nervous system injury. When patients with nonsurvivable injuries or advanced directives resulting in early care withdrawal were excluded, the mortality was 6 per cent. Extremes of age did not impact mortality[ ( $>80$  years, 21%) vs (65-79, 16%,  $P = 0.5$ )]. Most patients (53%) were discharged home. The application of our geriatric trauma protocol led to favorable results despite high injury acuity. These data suggest that even at the extremes of age, a large percentage of patients can be expected to survive. A prospective validation of these findings is warranted.

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#### **Community service provider perceptions of implementing older adult fall prevention in Ontario, Canada: a qualitative study**

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*BMC Geriatr.* 2018; 18(1): e34.

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**DOI** 10.1186/s12877-018-0725-3 **PMID** 29390983

#### **Abstract**

**BACKGROUND:** Despite evidence for effective fall prevention interventions, measurable reductions in older adult ( $\geq 65$  years) fall rates remain unrealized. This study aimed to describe the perceived barriers to and effective strategies for the implementation of evidence-based fall prevention practices within and across diverse community organizations. This study is unique in that it included community service providers who are not generally thought to provide fall prevention services to older adults, such as retail business, community support, volunteer services, community foundations, recreation centres, and various emergency services.

**METHODS:** Interviews and focus groups were conducted with a purposive sampling of providers ( $n = 84$ ) in varied roles within diverse community-based organizations across disparate geographical settings.

**RESULTS:** Community service providers experience significant multi-level barriers to fall prevention within and across organizations and settings. The overall challenge of serving dispersed populations in adverse environmental conditions was heightened in northern rural areas. Barriers across the system, within organizations and among providers themselves emerged along themes of Limited Coordination of Communication, Restrictive Organizational Mandates and Policies, Insufficient Resources, and Beliefs about Aging and Falls. Participants perceived that Educating Providers, Working Together, and Changing Policies and Legislation were strategies that have worked or would work well in implementing fall prevention. An unintentional observation was made that several participants in this extremely varied sample identified expanded roles in fall prevention for themselves during the interview process.

**CONCLUSIONS:** Community service providers experience disabling contexts for implementing fall prevention on many levels: their specific geography, their service systems, their organizations and themselves. A systemic lack of fit between the older adult and fall prevention services limits access, making fall prevention inaccessible, unaccommodating, unavailable, unaffordable, and

unacceptable. Educating Providers, Working Together, and Changing Policies and Legislation offers promise to create more enabling contexts for community stakeholders, including those who do not initially see their work as preventing falls.

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#### **Detecting frail, older adults and identifying their strengths: results of a mixed-methods study**

Dury S, Dierckx E, van der Vorst A, Van der Elst M, Fret B, Duppen D, Hoeyberghs L, De Roeck E, Lambotte D, Smetcoren AS, Schols J, Kempen G, Zijlstra GAR, De Lepeleire J, Schoenmakers B, Verté D, De Witte N, Kardol T, De Deyn PP, Engelborghs S, De Donder L.

*BMC Public Health* 2018; 18(1): e191.

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**DOI** 10.1186/s12889-018-5088-3 **PMID** 29378540

#### **Abstract**

**BACKGROUND:** The debate on frailty in later life focuses primarily on deficits and their associations with adverse (health) outcomes. In addition to deficits, it may also be important to consider the abilities and resources of older adults. This study was designed to gain insights into the lived experiences of frailty among older adults to determine which strengths can balance the deficits that affect frailty.

**METHODS:** Data from 121 potentially frail community-dwelling older adults in Flemish-speaking Region of Belgium and Brussels were collected using a mixed-methods approach. Quantitative data were collected using the Comprehensive Frailty Assessment Instrument (CFAI), Montreal Cognitive Assessment (MoCA), and numeric rating scales (NRS) for quality of life (QoL), care and support, meaning in life, and mastery. Bivariate analyses, paired samples t-tests and means were performed. Qualitative data on experiences of frailty, frailty balance, QoL, care and support, meaning in life, and mastery were collected using semi-structured interviews. Interviews were subjected to thematic content analysis.

**RESULTS:** The "no to mild frailty" group had higher QoL, care and support, meaning in life, and mastery scores than the "severe frailty" group. Nevertheless, qualitative results indicate that, despite being classified as frail, many older adults experienced high levels of QoL, care and support, meaning in life, and mastery. Respondents mentioned multiple balancing factors for frailty, comprising individual-level circumstances (e.g., personality traits, coping strategies, resilience), environmental influences (e.g., caregivers, neighborhood, social participation), and macro-level features (e.g., health literacy, adequate financial compensation). Respondents also highlighted that life changes affected their frailty balance, including changes in health, finances, personal relationships, and living situation.

**CONCLUSION:** The findings indicate that frailty among older individuals can be considered as a dynamic state and, regardless of frailty, balancing factors are important in maintaining a good QoL. The study investigated not only the deficits, but also the abilities, and resources of frail, older adults. Public policymakers and healthcare organizations are encouraged to include these abilities, supplementary or even complementary to the usual focus on deficits.

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### **Detection of near falls using wearable devices: a systematic review**

Pang I, Okubo Y, Sturnieks D, Lord SR, Brodie MA.

*J. Geriatr. Phys. Ther.* 2018; ePub(ePub): ePub.

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(Copyright © 2018, American Physical Therapy Association)

**DOI** 10.1519/JPT.000000000000181 **PMID** 29384813

#### **Abstract**

**BACKGROUND AND PURPOSE:** Falls among older people are a serious health issue. Remote detection of near falls may provide a new way to identify older people at high risk of falling. This could enable exercise and fall prevention programs to target the types of near falls experienced and the situations that cause near falls before fall-related injuries occur. The purpose of this systematic review was to summarize and critically examine the evidence regarding the detection of near falls (slips, trips, stumbles, missteps, incorrect weight transfer, or temporary loss of balance) using wearable devices. **METHODS:** CINAHL, EMBASE, MEDLINE, Compendex, and Inspec were searched to obtain studies that used a wearable device to detect near falls in young and older people with or without a chronic disease and were published in English.

**RESULTS:** Nine studies met the final inclusion criteria. Wearable sensors used included accelerometers, gyroscopes, and insole force inducers. The waist was the most common location to place a single device. Both high sensitivity ( $\geq 85.7\%$ ) and specificity ( $\geq 90.0\%$ ) were reported for near-fall detection during various clinical simulations and improved when multiple devices were worn. Several methodological issues that increased the risk of bias were revealed. Most studies analyzed a single or few near-fall types by younger adults in controlled laboratory environments and did not attempt to distinguish naturally occurring near falls from actual falls or other activities of daily living in older people.

**CONCLUSIONS:** The use of a single lightweight sensor to distinguish between different types of near falls, actual falls, and activities of daily living is a promising low-cost technology and clinical tool for long-term continuous monitoring of older people and clinical populations at risk of falls. However, currently the evidence is limited because studies have largely involved simulated laboratory events in young adults. Future studies should focus on validating near-fall detection in larger cohorts and include data from (i) people at high risk of falling, (ii) activities of daily living, (iii) both near falls and actual falls, and (iv) naturally occurring near falls.

#### **PDF Endnote Y**

### **Development and validation of Visual Impairment as a Risk for Falls Questionnaire**

Labreche T, Nandakumar K, Althomali M, Leat SJ.

*Age Ageing* 2018; ePub(ePub): ePub.

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(Copyright © 2018, Oxford University Press)

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#### **Abstract**

**PURPOSE:** visual impairment is associated with an increased risk of falls, yet eye care professionals are infrequently members of falls prevention clinics. The aim of this preliminary study was to validate a newly created Visual Impairment as a Risk for Falls Questionnaire intended to be used by those professionals not involved in eye care.

**METHODS:** about 53 participants with various visual impairments known to be associated with falls and 33 participants with normal sight were contacted within 4 months of a full oculo-visual assessment and were asked the questions from the current questionnaire pertaining to their visual function. A retrospective file review was undertaken and the sensitivity and specificity of participants' responses were calculated compared to the actual vision impairment based on the findings from their visual assessment.

**RESULTS:** the question regarding ability to read was included to identify people with central vision loss, a risk factor for falling. It was found to have sensitivity of 74% and specificity of 87%. Both sensitivity and specificity improved when participants with cognitive impairment were excluded. The question on recognising facial features gave sensitivity of 73% and specificity of 97% for this subgroup. However, questions related to impairments in stereopsis and peripheral fields were not useful.

**CONCLUSION:** the study demonstrates that several questions of the new questionnaire are useful; however, further testing with a larger population is needed to fully validate the questionnaire for use by health care professionals.

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**Differential diagnosis of unexplained falls in dementia: results of "syncope & dementia" registry**

Mossello E, Ceccofiglio A, Rafanelli M, Riccardi A, Mussi C, Bellelli G, Nicosia F, Bo M, Riccio D, Martone AM, Langellotto A, Tonon E, Noro G, Abete P, Ungar A.

*Eur. J. Intern. Med.* 2018; ePub(ePub): ePub.

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**Abstract** [Abstract unavailable]

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**Does poor oral health status increase the risk of falls? The JAGES Project Longitudinal Study**

Mochida Y, Yamamoto T, Fuchida S, Aida J, Kondo K.

*PLoS One* 2018; 13(2): e0192251.

**Affiliation:** Center for Well-being and Society, Nihon Fukushi University, Nagoya, Japan.

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**Abstract**

We sought to examine if self-reported oral health conditions regarding difficulty eating tough foods, dry mouth, choking, number of teeth and denture use are associated with incident falls. Our study was based on panel data from the Japan Gerontological Evaluation Study conducted in 2010 and 2013 using self-administered questionnaires. Data from 19,995 male and 20,858 female community-dwelling older people aged  $\geq 65$  years without a history of falls within the previous year in 2010 were analyzed. Multilevel logistic regression models were used to determine the association between poor oral health in 2010 and multiple incident falls in 2013 after adjusting for possible confounders and considering differences in municipalities. The percentage of males and females who reported falls in 2013 were 2.4% and 2.1%, respectively. After adjusting for age, educational

attainment, equivalized income, depression, self-rated health, instrumental activities of daily living, body mass index, present illness related to falls, social participation, walking in min/day, alcohol drinking status, and municipality population density, dry mouth in males (odds ratio [OR] = 1.41; 95% confidence interval [CI]: 1.12-1.77) and choking in females (OR = 1.64; 95% CI: 1.27-2.11) were significantly associated with incident falls. Difficulty eating tough foods in both sexes and choking in males were marginally associated with incident falls ( $p < 0.1$ ). Females having 10-19 teeth without dentures (OR = 1.63; 95% CI: 1.14-2.31),  $\leq 9$  teeth with dentures (OR = 1.36; 95% CI: 1.03-1.80), and  $\leq 9$  without dentures (OR = 1.46; 95% CI: 1.02-2.08) were significantly associated with incident falls compared with those having  $\geq 20$  teeth, respectively. These findings suggest that poor oral function, having fewer teeth, and not using dentures are predictors of incident falls. Further studies are needed to determine whether improving oral health can reduce the risk of falls.

#### PDF Y Endnote Y

#### Effects of dance on cognitive function among older adults: a protocol for systematic review and meta-analysis

Borhan A, Hewston P, Merom D, Kennedy C, Ioannidis G, Santesso N, Santaguida P, Thabane L, Papaioannou A.

*Syst. Rev.* 2018; 7(1): e24.

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#### Abstract

**BACKGROUND:** Cognitive impairment is characterized by problems in thinking, memory, language, and judgment that are greater than cognitive changes in normal aging. Considering the unprecedented growth of the older adult population and the projected increase in the prevalence of cognitive impairment, it is imperative to find effective strategies to improve or maintain cognitive function in older adults. The objective of this review is to summarize the effects of dance versus any other control group on cognitive function, physical function, adverse events, and quality of life in older adults.

**METHOD:** We will search the following databases MEDLINE, EMBASE, and Cochrane Central Register of Controlled Trials (CENTRAL) to identify the randomized controlled trials (RCTs) evaluating the effects of dance on cognitive function among older adults. Also, we will search <http://apps.who.int/trialsearch>, [clinicaltrials.gov](http://clinicaltrials.gov) and conference abstracts to identify ongoing and unpublished studies. There will be no restrictions on language, date, or journal of publication. Reviewers will independently and in duplicate screen for eligible studies using pre-defined criteria. Data extraction from eligible studies will be performed independently and in duplicate. The Cochrane risk of bias tool will be used to assess the risk of bias of studies. Our primary outcome of interest is cognitive function, more specifically the executive function domain. We will include other domains as well such as processing speed and reaction time. Secondary outcomes of interest are physical function. The secondary outcomes also include adverse events including falls and quality of life. We will use Review Manager (RevMan 5.3) to pool the effect of dance for each outcome where possible.

**RESULTS** will be presented as relative risks along with 95% confidence intervals for dichotomous outcomes and as mean differences, or standardized mean differences along with 95% confidence



intervals, for continuous outcomes. We will assess the certainty of the evidence using the GRADE approach and present findings in a Summary of Findings table.

DISCUSSION: This systematic review, to our best knowledge the first-ever, will synthesize the available evidence on the effects of dance on cognitive function among older people. SYSTEMATIC REVIEW REGISTRATION: PROSPERO CRD42017057138.

**PDF Y Endnote Y**

### **Effects of orthopedic insoles on static balance of older adults wearing thick socks**

Ma CZ, Wong DW, Wan AH, Lee WC.

*Prosthet. Orthot. Int.* 2018; ePub(ePub): ePub.

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**DOI** 10.1177/0309364617752982 **PMID** 29376482

#### **Abstract**

**BACKGROUND:** The wearing of socks and insoles may affect the ability of the foot to detect tactile input influencing postural balance.

**OBJECTIVES:** The aim of this study was to investigate whether (1) thick socks adversely affected the elderly postural balance and (2) orthopedic insoles could improve the elderly postural balance while wearing thick socks. **STUDY DESIGN:** Repeated-measures study design.

**METHODS:** In total, 14 healthy older adults were recruited. A monofilament test was conducted to evaluate foot plantar sensation with and without thick socks. Subjects then performed the Romberg tests under three conditions: (1) barefoot, (2) with socks only, and (3) with both socks and insoles. Postural balance was assessed by measuring the center of pressure movement during standing in each experimental condition.

**RESULTS:** Thick socks significantly decreased the monofilament score ( $p < 0.001$ ), suggesting reduction in ability to detect external forces. All center of pressure parameters increased significantly while wearing thick socks ( $p < 0.017$ ), implying reduction of postural stability. They then decreased significantly with the additional use of insoles ( $p < 0.017$ ).

**CONCLUSION:** Previous studies have documented the changes in plantar pressure distribution with the use of orthopedic insoles. This study further suggests that such changes in contact mechanics could produce some balance-improving effects, which appears not to have been reported earlier. Clinical relevance Wearing thick socks reduces plantar pressure sensitivity and increases postural sway which may increase risk of falls. Orthopedic insoles and footwear with similar design could potentially be a cost-effective method in maintaining postural balance when wearing thick socks.

**PDF Y Endnote Y**

### **Fall concern about older persons shifts to carers as changing health policy focuses on family, home-based care**

Ang SGM, O'Brien AP, Wilson A.

*Singapore Med. J.* 2018; 59(1): 9-11.

**Affiliation:** School of Nursing and Midwifery, Faculty of Health and Medicine, University of Newcastle, Australia.

(Copyright © 2018, Singapore Medical Association)

**DOI** 10.11622/smedj.2018005 **PMID** 29376188

## Abstract

With the Singaporean population ageing at an exponential rate, home carers are increasingly becoming essential partners in fall prevention and care delivery for older persons living at home and in the community. Singapore, like other Asian countries, regards the family as the main support structure for the older person, and national policies have been implemented to support this cultural expectation. Family carers experience similar concerns as older persons with regard to fall risk, and identifying and addressing these concerns can potentially lower fall risk and improve fall prevention for older persons. It is timely to remind ourselves - as concern about falls in older persons begins to shift to carers - to incorporate the influence of Asian cultural values and unique family dynamics of outsourcing family caregiving, in the management of older persons' fall risk in the community.

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### Home-related falls: an underestimated mechanism of injury

Abdelrahman H, Almadani A, El-Menyar A, Shunni A, Consunji R, Al-Thani H.

*J. Family Community Med.* (2010) 2018; 25(1): 48-51.

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(Copyright © 2018, Saudi Society of Family and Community Medicine, Publisher Medknow Publications)

**DOI** 10.4103/jfcm.JFCM\_148\_16 **PMID** 29386962 **PMCID** PMC5774043

## Abstract

**BACKGROUND:** The home is a leading location for falls, but the epidemiology and outcome of falls at home (FH) have not been adequately described. Our aim was to evaluate FH, particularly in the bathroom.

**MATERIALS AND METHODS:** We conducted a retrospective analysis of patients with a history of FH admitted to the Level I trauma center in Qatar. Patients were divided into Group 1: <60 years and Group 2: 60 year or older, and their data were analyzed and compared.

**RESULTS:** A total of 98 patients with FH in the bathroom with a mean age of  $51 \pm 18$  years, mostly males (73.5%) were identified over 3 years. One out of every 50 trauma patients admitted was a victim of a fall in the bathroom. Group 2 had significantly more females and sustained a single-site injury. Group 1 had more involvement of alcohol ( $P = 0.02$ ) and sustained more multiple injuries (44% vs. 23%;  $P = 0.02$ ). The mean Injury Severity Score and length of hospital stay was comparable among the two groups. Head, abdomen, and facial injuries were significantly higher in Group 1 whereas lower extremity injuries and mortality were significantly higher in Group 2.

**CONCLUSION:** FH, particularly in the bathroom, is an underrecognized mechanism of injury with a unique dichotomous epidemiology based on age. This needs increased public awareness and primary prevention programs for high-risk populations.

## PDF Y Endnote Y

### Falls among elderly and its relation with their health problems and surrounding environmental factors in Riyadh

Alshammari SA, Alhassan AM, Aldawsari MA, Bazuhair FO, Alotaibi FK, Aldakhil AA, Abdulfattah FW.

*J. Family Community Med.* (2010) 2018; 25(1): 29-34.



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**DOI** 10.4103/jfcm.JFCM\_48\_17 **PMID** 29386959 **PMCID** PMC5774040

### **Abstract**

**BACKGROUND:** Falls among the elderly are one of the major causes of morbidity and mortality worldwide. They constitute the second leading cause of unintentional deaths after road-traffic accidents. The aim of the study was to estimate the prevalence of falls among the elderly and to investigate the factors that contribute to this phenomenon.

**MATERIALS AND METHODS:** A cross-sectional analytical study was conducted in the elderly, over the age of 60, in Riyadh. The sample under scrutiny was estimated to be 357 in total. A pilot study was conducted among 15 subjects. Two questionnaires were used for the interviews which were translated into Arabic using the "Morse Fall Scale." The questionnaires assessed: the participants' previous history of falls, whether a secondary diagnosis had been obtained, whether any ambulatory aids had been used or whether an IV connection had been fitted during convalescence. They also inquired if any gait/transferring device had been used to assist the patient at any time.

**RESULTS:** Out of 357 participants, 206 (57.7%) had a history of falls. Study found an association between the number of falls recorded, the age of the participants, and whether the participant was female. Furthermore, there were statistically significant associations between the history of falls and a condition of impaired health. The results also showed that environmental hazards play a significant role in the occurrence of falls with  $P \leq 0.001$ , in which 103 (81.7%) of the individuals who were exposed to environmental hazards revealed a history of falls.

**CONCLUSION:** Falls among the elderly are common. Significantly, if the health of the individuals is impaired, and there are contiguous environmental risk factors, these elements combine to play a part in the occurrence of such falls. There is, therefore, a need to design and develop a health awareness program to prevent such problems in the elderly.

### **PDF Y Endnote Y**

#### **Measurement of attentional reserve and mental effort for cognitive workload assessment under various task demands during dual-task walking**

Shaw EP, Rietschel JC, Hendershot BD, Pruziner AL, Miller MW, Hatfield BD, Gentili RJ.

*Biol. Psychol.* 2018; ePub(ePub): ePub.

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### **Abstract**

Previous work focused on assessing cognitive workload has suggested EEG spectral content and component amplitudes of the event-related potential (ERP) waveform may index mental effort and attentional reserve, respectively. Although few studies have assessed attentional reserve and mental effort during upper-extremity performance, none employed a combined approach to measure cognitive workload during locomotion. Therefore, by systematically considering ERPs, spectral

content, and importantly, their combinations this study aimed to examine whether concurrent changes in spectral content and ERPs could collectively index cognitive workload during locomotion. Specifically, ERP and EEG markers were assessed as participants performed a cognitive task under two levels of difficulty (easy or hard) and two conditions (seated or walking). Changes in attentional reserve and mental effort appeared to collectively index cognitive workload under varying demands due to changes in task difficulty or performance conditions. This work can inform cognitive workload assessment in patient populations with gait deficiencies for future applications.

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#### PDF Y Endnote Y

#### **Older adults' utilization of community resources targeting fall prevention and physical activity**

McMahon SK, Park YS, Lewis B, Guan W, Oakes JM, Wyman JF, Rothman AJ.

*Gerontologist* 2018; ePub(ePub): ePub.

**Affiliation:** Department of Psychology, University of Minnesota, Minneapolis.

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**DOI** 10.1093/geront/gnx210 **PMID** 29401219

#### **Abstract**

**BACKGROUND AND OBJECTIVES:** Despite the availability of community resources, fall and inactivity rates remain high among older adults. Thus, in this article, we describe older adults' self-reported awareness and use of community resources targeting fall prevention and physical activity.

**RESEARCH DESIGN AND METHODS:** In-depth, semistructured interviews were conducted in Phase 1 with community center leaders (n = 5) and adults (n = 16) ≥70 years old whose experience with community programs varied. In Phase 2, surveys were administered to intervention study participants (n = 102) who were ≥70 years old, did not have a diagnosis of dementia, and reported low levels of physical activity.

**RESULTS:** Four themes emerged from Phase 1 data: (a) identifying a broad range of local community resources; (b) learning from trusted sources; (c) the dynamic gap between awareness and use of community resources; and (d) using internal resources to avoid falls. Phase 2 data confirmed these themes; enabled the categorization of similar participant-identified resources (10); and showed that participants who received encouragement to increase community resource use, compared to those who did not, had significantly greater odds of using ≥1 resource immediately postintervention, but not 6 months' postintervention.

**DISCUSSION AND IMPLICATIONS:** Although participants in this study were aware of a broad range of local community resources for physical activity, they used resources that support walking most frequently. Additionally, receiving encouragement to use community resources had short-term effects only.

**FINDINGS** improve our understanding of resources that need bolstering or better dissemination and suggest researchers identify best promotion, dissemination, implementation strategies.

#### PDF Y Endnote Y

#### **Programme frequency, type, time and duration do not explain the effects of balance exercise in older adults: a systematic review with a meta-regression analysis**

Farlie MK, Robins L, Haas R, Keating JL, Molloy E, Haines TP.

*Br. J. Sports Med.* 2018; ePub(ePub): ePub.

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(Copyright © 2018, BMJ Publishing Group)

DOI 10.1136/bjsports-2016-096874 PMID 29371222

### Abstract

**OBJECTIVE:** The objective of this systematic review was to examine the effects of different balance exercise interventions compared with non-balance exercise controls on balance task performance in older adults.

**DESIGN:** Systematic review.

**DATA SOURCES:** Medline, Cumulative Index to Nursing and Allied Health Literature, EMBASE, Scopus and Cochrane Database of Systematic Reviews were searched until July 2017.

**ELIGIBILITY CRITERIA FOR SELECTING STUDIES:** Systematic reviews and meta-analyses of randomised trials of balance exercise interventions for older adults were identified for extraction of eligible randomised trials. Eligibility criteria for inclusion of randomised trials in meta-analyses were comparison of a balance exercise intervention with a control group that did not perform balance exercises, report of at least one end-intervention balance outcome measurement that was consistent with the five subgroups of balance exercise identified, and full-text article available in English.

**RESULTS:** Ninety-five trials were included in meta-analyses and 80 in meta-regressions. For four balance exercise types (control centre of mass, multidimensional, mobility and reaching), significant effects for balance exercise interventions were found in meta-analyses (standardised mean difference (SMD) 0.31-0.50), however with considerable heterogeneity in observed effects ( $I^2$ : 50.4%-80.6%). Risk of bias assessments (Physiotherapy Evidence Database score and funnel plots) did not explain heterogeneity. One significant relationship identified in the meta-regressions of SMD and balance exercise frequency, time and duration explained 2.1% of variance for the control centre of mass subgroup.

**CONCLUSION:** Limitations to this study included the variability in design of balance interventions, incomplete reporting of data and statistical heterogeneity. The design of balance exercise programmes provides inadequate explanation of the observed benefits of these interventions.

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#### **The applicability of rhythm-motor tasks to a new dual task paradigm for older adults**

Kim SJ, Cho SR, Yoo GE.

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### Abstract

Given the interplay between cognitive and motor functions during walking, cognitive demands required during gait have been investigated with regard to dual task performance. Along with the needs to understand how the type of concurrent task while walking affects gait performance, there are calls for diversified dual tasks that can be applied to older adults with varying levels of cognitive decline. Therefore, this study aimed to examine how rhythm-motor tasks affect dual task performance and gait control, compared to a traditional cognitive-motor task. Also, it examined

whether rhythm-motor tasks are correlated with traditional cognitive-motor task performance and cognitive measures. Eighteen older adults without cognitive impairment participated in this study. Each participant was instructed to walk at self-paced tempo without performing a concurrent task (single walking task) and walk while separately performing two types of concurrent tasks: rhythm-motor and cognitive-motor tasks. Rhythm-motor tasks included instrument playing (WalkIP), matching to rhythmic cueing (WalkRC), and instrument playing while matching to rhythmic cueing (WalkIP+RC). The cognitive-motor task involved counting forward by 3s (WalkCount.f3). In each condition, dual task costs (DTC), a measure for how dual tasks affect gait parameters, were measured in terms of walking speed and stride length. The ratio of stride length to walking speed, a measure for dynamic control of gait, was also examined. The results of this study demonstrated that the task type was found to significantly influence these measures. Rhythm-motor tasks were found to interfere with gait parameters to a lesser extent than the cognitive-motor task (WalkCount.f3). In terms of ratio measures, stride length remained at a similar level, walking speed greatly decreased in the WalkCount.f3 condition. Significant correlations between dual task-related measures during rhythm-motor and cognitive-motor tasks support the potential of applying rhythm-motor tasks to dual task methodology. This study presents how rhythm-motor tasks demand cognitive control at different levels than those engaged by cognitive-motor tasks. It also indicates how these new dual tasks can effectively mediate dual task performance indicative of fall risks, while requiring increased cognitive resources but facilitating gait control as a compensatory strategy to maintain gait stability.

#### PDF Y Endnote Y

#### The effect of prolonged level and uphill walking on the postural control of older adults

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

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#### Abstract

Prolonged walking could alter postural control leading to an increased risk of falls in older adults. The aim of this study was to determine the effect of level and uphill prolonged walking on the postural control of older adults. Sixteen participants ( $64 \pm 5$  years) attended 3 visits. Postural control was assessed during quiet standing and the limits of stability immediately pre, post and post 15 min rest a period of 30 min walking on level and uphill (5.25%) gradients on separate visits. Each 30 min walk was divided into 3 10 min blocks, the limits of stability were measured between each block. Postural sway elliptical area (PRE:  $1.38 \pm 0.22$  cm<sup>2</sup>, POST:  $2.35 \pm 0.50$  cm<sup>2</sup>,  $p = .01$ ), medio-lateral (PRE:  $1.33 \pm 0.03$ , POST:  $1.40 \pm 0.03$ ,  $p = .01$ ) and antero-posterior detrended fluctuation analysis alpha exponent (PRE:  $1.43 \pm 0.02$ , POST:  $1.46 \pm 0.02$ ,  $p = .04$ ) increased following walking. Medio-lateral alpha exponent decreased between post and post 15 min' rest (POST:  $1.40 \pm 0.03$ , POST15:  $1.36 \pm 0.03$ ,  $p = .03$ ). Forward limits of stability decreased between the second walking interval and post 15 min' rest (Interval 2:  $28.1 \pm 1.6\%$ , POST15:  $25.6 \pm 1.6\%$ ,  $p = .01$ ) and left limits of stability increased from pre-post 15 min' rest (PRE:  $27.7 \pm 1.2\%$ , POST15:  $29.4 \pm 1.1\%$ ,  $p = .01$ ). The neuromuscular alterations caused by prolonged walking decreased the anti-persistence of postural sway and altered the limits of stability in older adults. However, 15 min' rest was insufficient to return postural control to pre-exercise levels.

## PDF Y Endnote Y

### **The effects of a multicomponent intervention program on clinical outcomes associated with falls in healthy older adults**

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

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#### **Abstract**

**BACKGROUND:** Multicomponent intervention programs have been shown to be effective in reducing risk factors associated with falls, but the primary target population of these interventions is often low-functioning older adults. **AIMS:** The purpose of this study was to investigate the effectiveness of a multicomponent intervention program focusing on balance and muscle strength for independently functioning community-dwelling older adults.

**METHODS:** Fifty-three independently functioning older adults, aged  $80.09 \pm 6.62$  years, participated in a group exercise class (conducted 2 times/week for 8 weeks) emphasizing balance. Outcome measures were balance performance using the Fullerton Advanced Balance (FAB) scale and muscle strength using the Senior Fitness Test (SFT).

**RESULTS:** The intervention improved balance ( $P < 0.001$ ), and older adults who were classified as having high fall risks based on the FAB scores at pre-testing improved more than older adults who were classified as having low fall risks ( $P = 0.017$ ). As a result, 22 participants transitioned from a high fall risk group at pre-testing to a low fall risk group at post-testing ( $P < 0.001$ ). The intervention also enhanced both upper and lower muscle extremity strength based on SFT results ( $P < 0.001$ ) regardless of participants' classification of fall risk status.

**CONCLUSIONS AND DISCUSSION:** The multicomponent intervention conducted two times per week for 8 weeks was effective in improving balance and enhancing muscle strength of independently functioning older adults. The results underscore the importance of providing fall prevention interventions to healthy older adults, a population often not a target of balance interventions.

## PDF Y Endnote Y

### **The modified Otago Exercises prevent grip strength deterioration among older fallers in the Malaysian Falls Assessment and Intervention Trial (MyFAIT)**

Liew LK, Tan MP, Tan PJ, Mat S, Majid LA, Hill KD, Mazlan M.

*J. Geriatr. Phys. Ther.* 2018; ePub(ePub): ePub.

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(Copyright © 2018, American Physical Therapy Association)

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#### **Abstract**

**BACKGROUND AND PURPOSE:** Exercise-based interventions, such as the Otago Exercise Program (OEP), are effective in preventing falls in the older adult. Previous studies evaluating the OEP have determined falls, lower limb strength, or balance outcomes but with lack of assessment of hand grip strength. The objective of this study is to evaluate the effect of OEP on hand grip strength alongside

mobility and balance outcomes.

**METHODS:** This was a single-center, prospective, and single-blind randomized controlled trial conducted at the University Malaya Medical Centre. Patients older than 65 years presenting to the hospital emergency department or geriatric clinic with 1 injurious fall or 2 falls in the past year and with impaired functional mobility were included in the study. The intervention group received a modified OEP intervention (n = 34) for 3 months, while the control group received conventional care (n = 33). All participants were assessed at baseline and 6 months.

**RESULTS:** Twenty-four participants in both OEP and control groups completed the 6-month follow-up assessments. Within-group analyses revealed no difference in grip strength in the OEP group (P = 1.00, right hand; P = .55, left hand), with significant deterioration in grip strength in the control group (P = .01, right hand; P = .005, left hand). Change in grip strength over 6 months significantly favored the OEP group (P = .047, right hand; P = .004, left hand). Significant improvements were also observed in mobility and balance in the OEP group.

**CONCLUSIONS:** In addition to benefits in mobility and balance, the OEP also prevents deterioration in upper limb strength. Additional benefits of exercise interventions for secondary prevention of falls in term of sarcopenia and frailty should also be evaluated in the future.

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### **Validation of an ambient system for the measurement of gait parameters**

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

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#### **Abstract**

Fall risk in elderly people is usually assessed using clinical tests. These tests consist in a subjective evaluation of gait performed by healthcare professionals, most of the time shortly after the first fall occurrence. We propose to complement this one-time, subjective evaluation, by a more quantitative analysis of the gait pattern using a Microsoft Kinect. To evaluate the potential of the Kinect sensor for such a quantitative gait analysis, we benchmarked its performance against that of a gold-standard motion capture system, namely the OptiTrack. The "Kinect" analysis relied on a home-made algorithm specifically developed for this sensor, whereas the OptiTrack analysis relied on the "built-in" OptiTrack algorithm. We measured different gait parameters as step length, step duration, cadence, and gait speed in twenty-five subjects, and compared the results respectively provided by the Kinect and OptiTrack systems. These comparisons were performed using Bland-Altman plot (95% bias and limits of agreement), percentage error, Spearman's correlation coefficient, concordance correlation coefficient and intra-class correlation. The agreement between the measurements made with the two motion capture systems was very high, demonstrating that associated with the right algorithm, the Kinect is a very reliable and valuable tool to analyze gait. Importantly, the measured spatio-temporal parameters varied significantly between age groups, step length and gait speed proving the most effective discriminating parameters. Kinect-monitoring and quantitative gait pattern analysis could therefore be routinely used to complete subjective clinical evaluation in order to improve fall risk assessment during rehabilitation.

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## PDF Y Endnote Y

### Validity of Brief Cognitive Assessment Tool modifications for older adults with visual and motor limitations

Mace RA, Mansbach WE.

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#### Abstract

**INTRODUCTION:** The prevalence of cognitive, sensory, and physical impairments is expected to grow alongside increasing life expectancy. These chronic conditions pose challenges for geriatric assessment. We examined whether Brief Cognitive Assessment Tool (BCAT) modifications to accommodate visual and motor limitations would retain strong validity for identifying mild cognitive impairment (MCI) and dementia.

**METHOD:** Psychometric analyses were performed on archival data (N = 458) from community-dwelling older adults and residents of assisted living facilities and nursing homes in Maryland, USA (age ≥ 50 years). Participants completed a brief testing battery, including the BCAT, and were assigned a cognitive diagnosis (normal cognition, MCI, mild dementia, moderate dementia, severe dementia) by licensed clinical psychologists.

**RESULTS:** Receiver operator characteristic curve analyses evidenced excellent diagnostic validity of BCAT modification cutoffs for identifying the cognitive categories. Contextual memory and executive control factors, which explained over 80% of variance in cognitive diagnoses, may account for the preservation of validity despite BCAT modifications.

**CONCLUSIONS:** The results indicate strong psychometric evidence for the BCAT modifications and provide cutoffs for identifying MCI and staging dementia. For clinicians, the score guidelines are preferable to the guesswork involved with adjusting cutoffs to accommodate visual and motor limitations.

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### An intervention to improve balance in persons with multiple sclerosis

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**Abstract** [Abstract unavailable]

## PDF Endnote Y

### Neurological disorders of gait, balance and posture: a sign-based approach

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*Nat. Rev. Neurol.* 2018; ePub(ePub): ePub.

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#### **Abstract**

Neurological disorders of gait, balance and posture are both debilitating and common. Adequate recognition of these so-called disorders of axial mobility is important as they can offer useful clues to the underlying pathology in patients with an uncertain clinical diagnosis, such as those early in the course of neurological disorders. Medical teaching programmes typically take classic clinical presentations as the starting point and present students with a representative constellation of features that jointly characterize a particular axial motor syndrome. However, patients rarely present in this way to a physician in clinical practice. Particularly in the early stages of a disease, patients might display just one (or at best only a few) abnormal signs of gait, balance or posture. Importantly, these individual signs are never pathognomonic for any specific disorder but rather come with an associated differential diagnosis. In this Perspective, we offer a new diagnostic approach in which the presenting signs are taken as the starting point for a focused differential diagnosis and a tailored search into the underlying neurological syndrome.

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#### **Use of the Nursing Outcomes Classification for falls and fall prevention by nurses in South Korea**

Lee E. *Int. J. Nurs. Knowl.* 2018; ePub(ePub): ePub.

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#### **Abstract**

**PURPOSE:** To estimate the use of the Nursing Outcomes Classification (NOC) for falls and fall prevention.

**METHODS:** This cross-sectional, descriptive study enrolled 196 registered nurses in South Korea.

**FINDINGS:** Outcome assessments for falls and fall prevention were performed for 30-50% of hospitalized patients. The NOC outcomes related to falls and fall prevention were used more in surgical units than medical units.

**CONCLUSIONS:** The performance rates of the outcomes related to falls and fall prevention were not high in hospitalized patients. **IMPLICATIONS FOR NURSING PRACTICE:** Strategies should be developed to increase the use of the NOC by nurses for fall prevention. In this way, nurses' contributions to patient outcomes would be recognized and the safety of patients would be enhanced.

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