

## Safety Literature 1<sup>st</sup> March 2020

### 'I've always done what I was told by the medical people': a qualitative study of the reasons why older adults attend multifactorial falls risk assessments mapped to the Theoretical Domains Framework

Racine E, Soye A, Barry P, Cronin F, Hosford O, Moriarty E, O'Connor KA, Turvey S, Timmons S, Kearney PM, McHugh SM. *BMJ Open* 2020; 10(2): e033069.

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#### Abstract

**OBJECTIVES:** Multifactorial falls risk assessments reduce the rate of falls in older people and are recommended by international guidelines. Despite their effectiveness, their potential impact is often constrained by barriers to implementation. Attendance is an issue. The aim of this study was to explore why older people attend community-based multifactorial falls risk assessment clinics, and to map these reasons to a theoretical framework.

**DESIGN:** This is a qualitative study. Semi-structured interviews were conducted and analysed thematically. Each theme and subtheme were then mapped onto the Theoretical Domains Framework (TDF) to identify the determinants of behaviour. **PARTICIPANTS:** Older adults (aged 60 and over) who attended community-based multifactorial falls risk assessments.

**RESULTS:** Sixteen interviews were conducted. Three main themes explained participants' reasons for attending the multifactorial risk assessment; being that 'type of person', being 'linked in' with health and community services and having 'strong social support'. Six other themes were identified, but these themes were not as prominent during interviews. These were knowing what to expect, being physically able, having confidence in and being positive towards health services, imagining the benefits given previous positive experiences, determination to maintain or regain independence, and being 'crippled' by the fear of falling. These themes mapped on to nine TDF domains: 'knowledge', 'skills', 'social role and identity', 'optimism', 'beliefs about consequences', 'goals', 'environmental context and resources', 'social influences' and 'emotion'. There were five TDF domains that were not relevant to the reasons for attending.

**CONCLUSIONS:** These findings provide theoretically based factors that influence attendance which can be used to inform the development of interventions to improve attendance to falls prevention programmes.

Language: en

#### Keywords

attendance; falls; multifactorial falls risk assessments; older people; theoretical domains framework

## **A longitudinal study of the negative impact of falls on health, well-being, and survival in later life: the protective role of perceived control**

Jónsdóttir HL, Ruthig JC. *Aging Ment. Health* 2020; ePub(ePub): ePub.

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(Copyright © 2020, Informa - Taylor and Francis Group)

**DOI** 10.1080/13607863.2020.1725736 **PMID** 32081033

### **Abstract**

**Objectives:** Falls can have detrimental effects on older adults' psychological well-being, physical health, and survival rates. However, certain psychosocial mediators may lessen the negative impact of suffering a fall on health and well-being. Perceived control is a psychosocial factor that was examined as a mediator of the falls - health and well-being relationship in the current study. **Method:** Participants were 232 community-dwelling older adults, age 68 or older who took part in a longitudinal study in 2008 and 2010 and completed measures of perceived control, self-rated health, health-care utilization, number of falls, depressive symptomology, and perceived stress. Survival was also tracked for seven years from 2008 through 2015. **Results:** Older adults who suffered a fall had poorer health and well-being two years later compared to those who did not suffer a fall. Perceived control mediated the negative impact of falls on subsequent health and well-being outcomes two years later. Among older adults who experienced a fall, higher levels of perceived control predicted better subsequent health and well-being. Suffering one or more falls also predicted less likelihood of survival seven years later, beyond the effects of age, gender, marital status, and education. **Conclusion:** Findings highlight the importance of assessing risk of falling and levels of perceived control in later life.

Language: en

### **Keywords**

Falls; aging; older adults; perceived control; survival

## **A qualitative study exploring physical therapists' views on the Otago Exercise Programme for fall prevention: a stepping stone to "age in place" and to give faith in the future**

Cederbom S, Bjerck M, Bergland A. *Physiother. Theory Pract.* 2020; ePub(ePub): ePub.

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### **Abstract**

**Background:** One of the most effective interventions to prevent falls is exercise. A commonly used program that prevents falls is the Otago Exercise Programme (OEP). Despite this, user-based knowledge of its applicability in real-world settings for older adults who are dependent on formal care in their homes is lacking. **Purposes:** To explore how physical therapists (PTs) experience the applicability of the OEP in clinical practice for home-dwelling older adults who are dependent on formal home care and to determine their beliefs regarding the benefits of the OEP for living longer at home. **Methods:** Semi-structured interviews were conducted with 17 physical therapists. Data were analyzed using qualitative thematic analysis. **Results:** The OEP was described by PTs to be applicable in clinical practice. Their experience was that the OEP seemed to be meaningful and to have a strong relationship with everyday activities. The OEP improved physical function, mood, self-efficacy, and participation in social activities in older adults, as well as provided faith in the future. **Conclusion:** The OEP is suitable for use in a primary care setting, and according to the perceptions of physical therapists, the OEP contributes to older adults' capability to live longer at home.

Language: en

### **Keywords**

Fall; home-based intervention; independence; older; self-efficacy

## Age-related differences to neck muscle activation latency as a potential risk factor to fall-related traumatic brain injuries

Wood TA, Hernandez ME, Sosnoff JJ. *J. Electromyogr. Kinesiol.* 2020; 51: e102405.

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### Abstract

This investigation examined age-related differences in neck muscle activation latency in response to anterior and posterior postural perturbations to understand the potential implications in fall-related traumatic brain injuries. 57 adults were recruited and categorized into 3 groups based on age: Young (18-30 years old), Young-Old (60-74 years) and Old-Old (75-89 years) group. Study participants underwent six anterior and posterior postural perturbations while bilateral sternocleidomastoid, upper trapezius, and splenius capitis electromyography was collected. Muscle activation latency time was calculated with established procedures. During anterior translations, a significant group effect for muscle activation latency of the right SCM ( $F(2,43) = 8.786, p < 0.001$ ), right ( $F(2,34) = 4.838, p = 0.014$ ) and left ( $F(2,34) = 5.015, p = 0.012$ ) upper trapezius, and right ( $F(2,45) = 3.195, p = 0.050$ ) and left ( $F(2,45) = 3.819, p = 0.029$ ) splenius capitis was observed. During posterior translations, a significant group effect for muscle activation latency was observed in the right ( $F(2,34) = 6.419, p = 0.004$ ) and left ( $F(2,41) = 5.275, p = 0.009$ ) SCM, and the right ( $F(2,34) = 4.925, p = 0.013$ ) and left ( $F(2,32) = 4.055, p = 0.027$ ) upper trapezius. Both older groups displayed longer muscle activation latencies than the young group. The age-related differences in neck muscle activation latency may be placing older adults at a greater risk of fall-related traumatic brain injuries.

Language: en

### Keywords

Accidental falls; Aging; Neck muscles; Traumatic brain injuries

## Assessing the relationship between the Enhanced Gait Variability Index and falls in individuals with Parkinson's disease

Schmitt AC, Baudendistel ST, Fallon MS, Roper JA, Hass CJ. *Parkinsons Dis.* 2020; 2020: e5813049.

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### Abstract

Gait impairment and increased gait variability are common among individuals with Parkinson's disease (PD) and have been associated with increased risk for falls. The development of composite scores has gained interest to aggregate multiple aspects of gait into a single metric. The Enhanced Gait Variability Index (EGVI) was developed to compare an individual's gait variability to the amount of variability in a healthy population, yet the EGVI's individual parts may also provide important information that may be lost in this conversion. We sought to contrast individual gait measures as predictors of fall frequency and the EGVI as a single predictor of fall frequency in individuals with PD. 273 patients (189M, 84F;  $68 \pm 10$  yrs) with idiopathic PD walked over an instrumented walkway and reported fall frequency over three months (never, rarely, monthly, weekly, or daily). The predictive ability of gait velocity, step length, step time, stance time, and single support time and the EGVI was assessed using regression techniques to predict fall frequency. The EGVI explained 15.1% of the variance in fall frequency ( $p < 0.001$ ,  $r = 0.389$ ). Although the regression using the combined spatiotemporal measures to predict fall frequency was significant ( $p=0.002$ ,  $r = 0.264$ ), none of the components reached significance (gait velocity:  $p=0.640$ , step length:  $p=0.900$ , step time:  $p=0.525$ , stance time:  $p=0.532$ , single support time:  $p=0.480$ ). The EGVI is a better predictor of fall frequency in persons with PD than its individual spatiotemporal components. Patients who fall more frequently have more variable gait, based on the interpretation of the EGVI. While the EGVI provides an objective measure of gait variability with some ability to predict fall frequency, full clinical interpretations and applications are currently unknown.

Language: en

## Autonomic function, postprandial hypotension and falls in older adults at one year after critical illness

Ali Abdelhamid Y, Weinel LM, Hatzinikolas S, Summers M, Nguyen TAN, Kar P, Phillips LK, Horowitz M, Deane AM, Jones KL. Crit. Care Resusc. 2020; 22(1): 53-62.

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### Abstract

**OBJECTIVE:** Postprandial hypotension occurs frequently in older survivors of critical illness at 3 months after discharge. We aimed to determine whether postprandial hypotension and its predictors - gastric dysmotility and cardiovascular autonomic dysfunction - persist or resolve as older survivors of critical illness recover, and whether postprandial hypotension after intensive care unit (ICU) discharge is associated with adverse outcomes at 12 months.

**DESIGN:** Prospective observational study. **SETTING:** Tertiary medical-surgical ICU.

**PARTICIPANTS:** Older adults (aged  $\geq 65$  years) who had been studied 3 months after ICU discharge and who returned for a follow-up study at 12 months after discharge.

**MAIN OUTCOME MEASURES:** On both occasions after fasting overnight, participants consumed a 300 mL drink containing 75 g glucose, radiolabelled with 20 MBq  $^{99m}\text{Tc}$ phytate. Blood pressure, heart rate, blood glucose concentration and gastric emptying rate were measured concurrently before and after ingestion of the drink. Falls, quality of life, hospitalisation and mortality rates were also quantified.

**RESULTS:** Out of 35 older adults studied at 3 months, 22 returned for the follow-up study at 12 months. Postprandial hypotension was evident in 29% of participants (95% CI, 14-44%) at 3 months and 10% of participants (95% CI, 1-30%) at 12 months. Postprandial hypotension at 3 months was associated with a more than threefold increase in the risk of falls in the year after ICU discharge (relative risk, 3.7 [95% CI, 1.6-8.8];  $P = 0.003$ ). At 12 months, gastric emptying was normal (mean time taken for 50% of gastric contents to empty, 101.6 [SD, 33.3] min) and cardiovascular autonomic dysfunction prevalence was low (9% [95% CI, 1-29%]).

**CONCLUSIONS:** In older adults who were evaluated 3 and 12 months after ICU discharge, postprandial hypotension at 3 months was associated with an increased risk of subsequent falls, but the prevalence of postprandial hypotension decreased with time.

Language: en

## **Bedrails and falls in nursing homes: a systematic review**

Huynh D, Lee ON, An PM, Ens TA, Mannion CA. Clin. Nurs. Res. 2020; ePub(ePub): ePub.

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**DOI** 10.1177/1054773820907805 **PMID** 32088988

### **Abstract**

Bedrail use for fall prevention in elderly clients (>65 years) is controversial. Some healthcare providers believe bedrails prevent falls, while others think they are ineffective and dangerous. A systematic review was conducted to address: "For older adults living in nursing homes, does more or less bedrail use reduce the incidence of falls?" We searched HealthStar, MEDLINE, CINAHL, Academic Search complete ProQuest and Canadian Health Research Collection using "elder\*," "bedrail\*," "fall\*," and "assisted-living\*." After filtering for primary data, English records, older adult population, relationship between bedrails and falls, fourteen studies remained.

RESULTS suggest using alternative fall prevention measures, and bedrails are either beneficial, harmful, or do not influence falls. Bedrail reduction with fall prevention interventions led to no changes in fall frequency. Ambiguity persists regarding fall frequencies and bedrail use without using other fall prevention strategies. Educating health care providers on fall prevention is key to patient safety.

Language: en

### **Keywords**

bedrails; elderly; falls; injuries; long-term care; older adults



## **Does dual-tasking provide additional value in timed "up and go" test for predicting the occurrence of falls? A longitudinal observation study by age group (young-older or old-older adults)**

Asai T, Oshima K, Fukumoto Y, Yonezawa Y, Matsuo A, Misu S. *Aging Clin. Exp. Res.* 2020; ePub(ePub): ePub.

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**DOI** 10.1007/s40520-020-01510-6 **PMID** 32086716

### **Abstract**

**BACKGROUND:** Previous studies using relatively large samples and longitudinal observational designs reported dual-tasking had additional value in timed "up and go" test (TUG) for falls assessment among well-functioning older adults.

**AIM:** To elucidate the additional value of dual-tasking in TUG for predicting the occurrence of falls among community-dwelling older adults by age group using a predictive model.

**METHODS:** This longitudinal observation study included 987 community-dwelling older adults at baseline. A TUG without performing another task (single-TUG) and a TUG while counting aloud backward from 100 were conducted at baseline. We computed the dual-task cost (DTC) value, which is used to quantify trends in subjects' execution of motor tests under dual-task conditions. Data on fall history were obtained using a self-administered questionnaire at the 1-year follow-up. The final analysis included 649 individuals divided into a young-older adult group (aged 60-74 years) and an old-older adult group (aged  $\geq 75$  years). Associations between the occurrence of falls and TUG-related values were analyzed by age group using multivariate logistic regression models.

**RESULTS:** For old-older adults, there were significant associations between the occurrence of falls and single-TUG time (odds ratio [OR] 1.143, 95% confidence interval [CI] 1.018-1.285) and DTC value (OR 0.981, 95% CI 0.963-0.999). No significant associations were observed for young-older adults.

**CONCLUSIONS:** Slower single-TUG time and lower DTC value are associated with the occurrence of falls among old-older adults but not among young-older adults. Dual tasking may provide an additional value in TUG for predicting falls among old-older adults.

Language: en

### **Keywords**

Community-dwelling older adults; Dual tasking; Fall; Timed "up and go" test



## **Experiences of the built environment, falls and fear of falling outdoors among older adults: an exploratory study and future directions**

Curl A, Fitt H, Tomintz M. *Int. J. Environ. Res. Public Health* 2020; 17(4): e1224.

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### **Abstract**

Falls can have serious impacts on the health, wellbeing and daily mobilities of older adults. Falls are a leading cause of injury and death amongst older adults and outdoor falls comprise a substantial proportion of pedestrian injuries. As well as physical injuries, the psychological impacts of experiencing a fall can result in older adults getting out of the house less often, resulting in lower levels of physical activity and social connection. Despite the known consequences of falls, relatively little research considers the impact of the urban built environment on falls among older adults. This research aimed to explore the experiences of older adults in the urban environment, falling and the fear of falling outdoors. We conducted an online survey with adults aged 50+ using a participatory mapping survey tool and a convenience sample. The study area was Greater Christchurch, New Zealand.

**RESULTS** suggest that both perceived accessibility and neighbourhood conditions are independently associated with fear of falling, after controlling for frequency of falling, gender and activities of daily living. Our findings demonstrate the need for much better understandings of the relationships between the urban environment, outdoor mobility, fear of falling and falling among older adults and we propose suggestions for future research.

Language: en

### **Keywords**

ageing; built environment; falls; fear of falling; mobility; wellbeing

## **Interventions aimed at loneliness and fall prevention reduce frailty in elderly urban population**

Ožić S, Vasiljev V, Ivković V, Bilajac L, Rukavina T. *Medicine (Baltimore)* 2020; 99(8): e19145.

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**DOI** 10.1097/MD.00000000000019145 **PMID** 32080091

### **Abstract**

Frailty is a pronounced symptom of aging associated with multiple comorbid states and adverse outcomes. The aim of this study was to evaluate the impact of 2 interventions, one based on prevention of falls and the other on prevention of loneliness, on total frailty and dimensions of frailty in urban community-dwelling elderly as well as associations with independent living. This prospective interventional study followed up 410 persons aged 75 to 95. The participants of the control and intervention groups were monitored through a public health intervention programme. The level of frailty was measured by the Tilburg Frailty Indicator (TFI) questionnaire and the factors of independent living were analyzed using validated questionnaires. After 1 year, physical frailty measured in the control group showed a statistically significant increase ( $r=-0.11$ ), while in the intervention groups physical frailty did not increase (both  $P>.05$ ). Psychological frailty measured after 1 year in the control group was significantly higher ( $r=-0.19$ ), as well as in the group where the public health interventions to reduce loneliness were carried out ( $r=-0.19$ ). Psychological frailty did not increase in the group in which public health interventions to prevent falls were carried out, and social frailty did not increase at all in the study period. The total level of frailty in the control group after 1 year was significantly increased ( $r=-0.19$ ), while no increase was seen in the overall frailty in the intervention group. Multivariate analysis has shown that both interventions were independently associated with lower end frailty. Additionally, higher baseline frailty and visit to a physician in the last year were positively associated with higher end-study frailty level, while higher number of subjects in the household and higher total psychological quality of life (SF-12) were independently associated with lower end-study frailty. Only in the prevention of falls group there was no increase in restriction in the activities of daily living throughout study follow-up. Public health interventions to prevent falls and to prevent loneliness have a positive effect on the frailty and independent living of the elderly living in their own homes in an urban community.

Language: en

## **Obstacle-crossing task-related usual gait patterns of older adults differentiating falls and gait ability**

Ko SU, Jerome GJ, Simonsick EM, Ferrucci L. J. Aging Phys. Act. 2020; ePub(ePub): ePub.

(Copyright © 2020, Human Kinetics Publishers)

**DOI** 10.1123/japa.2019-0227 **PMID** 32084628

### **Abstract**

Obstacle crossing, such as stepping over a curb, exerts additional demands on balance control, and therefore the study of usual-pace gait patterns associated with obstacle-crossing performance may provide additional insight into understanding falls and deterioration of gait in older adults. Participants included 432 adults aged 60-96 years (218 women). Participants who failed the obstacle-crossing task ( $n = 181$ ) walked slower with smaller knee range of motion than participants who successfully completed the obstacle-crossing task (all  $ps < .001$ ). Participants who failed the obstacle crossing reported a greater likelihood of falling in the previous year, more balance problems, lower walking ability, and needed longer time to complete 5 chair stands than those who passed the task (all  $ps < .05$ ). Obstacle-crossing task may identify gait patterns in older adults who appear functionally intact, but who are nonetheless at risk of fall and balance problems.

Language: en

### **Keywords**

Baltimore Longitudinal Study of Aging (BLSA); balance control; knee range of motion; physical function

## Patient fall risk caused by unintended diphenhydramine use

McKeirnan KC, Frazier KR, Yabusaki AA. *Sr. Care Pharm.* 2020; 35(3): 113-119.

(Copyright © 2020, American Society of Consultant Pharmacists)

DOI 10.4140/TCP.n.2020.113 PMID 32070459

### Abstract

A 62-year-old patient living in a rural community was referred to participate in a pharmacist-led home visit program because of concerns with the patient's increasing falls and medication complexity. The patient reported experiencing an increasing number of falls over the past few months, resulting in a recent hospitalization and mild head trauma. The patient's past medical history included diabetes mellitus type 2, hypertension, hyperlipidemia, gastroesophageal reflux disease, paroxysmal atrial fibrillation, unspecified back pain, and benign prostatic hyperplasia. During the comprehensive medication review, pharmacists determined the patient had inadvertently purchased an acetaminophen/ diphenhydramine combination medication, rather than his usual acetaminophen. According to the 2019 Beers criteria, use of acetaminophen/diphenhydramine for back pain without insomnia is not the best option and may contribute to falls. With an estimated four to eight tablets per day, the patient was taking 200-400 mg of diphenhydramine daily. Pharmacist recommendations included contacting the prescribing physician to obtain a prescription for acetaminophen. By asking the local pharmacy to dispense acetaminophen as a prescription, the risk of the patient inadvertently purchasing an inappropriate product is reduced. After removing the diphenhydramine from the patient's regimen, the falls ceased. This case demonstrates the effects of inappropriate diphenhydramine use in an especially vulnerable population. It also highlights the critical role that rural community pharmacists can play in improving their patients' health care.

Language: en

## **Risk for physical dependence in community-dwelling older adults: the role of fear of falling, falls and fall-related injuries**

Pereira C, Bravo J, Raimundo A, Tomas-Carus P, Mendes F, Baptista F. *Int. J. Older People Nurs.* 2020; ePub(ePub): ePub.

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### **Abstract**

**BACKGROUND:** Falls and fall-related injuries along with fear of falling (FoF) seem to restrict activities of daily living (ADL), resulting in physical dependence. However, it is still unclear how falls and related injuries or FoF by themselves explain general and specific ADL dependence.

**OBJECTIVES:** To investigate the relationships between falls and related injuries, FoF and physical dependence on ADL in community-dwelling older adults, controlling for age, gender, physical activity and physical fitness as confounders.

**METHODS:** This cross-sectional descriptive study assessed 588 community-dwelling older adults. Falls and fall-related injuries, ADL dependence on basic, instrumental and advanced activities, FoF, demographic characteristics and health conditions were assessed through a questionnaire. Physical activity was measured through the International Physical Activity Questionnaire. Physical fitness was assessed by the Senior Fitness Test and the Fullerton Advanced Balance Scale. Body composition was measured through bioimpedance.

**RESULTS:** Severe injuries occurrence increased the likelihood of moderate and high physical dependence by 3 and 6 times, while FoF increased this likelihood by 3 and 7 times, respectively. Also, the occurrence of previous falls, resulting in severe injuries, increased the likelihood of dependence in two instrumental ADL (3 and 4 times), while FoF increased this likelihood in numerous basic, instrumental and advanced ADL (2-3 times). The FoF was shown to explain overall physical functioning dependence, by itself, representing a constraint on the performance of most basic, instrumental and advanced ADL.

**CONCLUSION:** The FoF showed to be a greater threat to ADL dependence than falls and related injuries. Assessment guidelines for older adults living in the community should include the FoF in clinical evaluation. **IMPLICATIONS FOR PRACTICE:** Understand the isolated interplay of FoF and previous falls and injuries on ADL dependence among older adults allows healthcare professionals to perform more accurate clinical evaluations and develop more successful interventions to prevent further dependence.

Language: en

### **Keywords**

accidental falls; activities of daily living; ageing; fear; independent living; physical fitness; practice guidelines

## Trajectory of recurrent falls in post-menopausal breast cancer survivors and in matched cancer-free controls

Pan K, Ray RM, Cauley JA, Shadyab AH, Hurria A, Chlebowski RT. *Breast Cancer Res. Treat.* 2020; ePub(ePub): ePub.

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DOI 10.1007/s10549-020-05576-8 PMID 32076891

### Abstract

**PURPOSE:** Cross-sectional studies suggest that falls are prevalent among older breast cancer survivors. However, fall risk in this population has not been comprehensively examined. Therefore, we compared fall risk in older women post-breast cancer diagnosis to fall risk before cancer diagnosis and to risk in cancer-free matched controls.

**METHODS:** Among 2019 women in the Women's Health Initiative with localized breast cancer diagnosed at age  $\geq 60$  years with fall assessment data for 3 years pre-diagnosis and 3 years post-diagnosis, recurrent fall risk post-diagnosis was compared to risk in 2019 cancer-free controls matched by age, year of WHI entry, and baseline fall frequency. Generalized estimating equations under a logistic regression model were used to compare fall recurrence in breast cancer survivors and controls. Multi-variable models were adjusted for the matching factors, race/ethnicity, body mass index, and multiple chronic conditions.

**RESULTS:** In breast cancer survivors aged 70.8 years (mean) at diagnosis, over the 3-year pre-diagnosis interval, recurrent falls were reported by 18.5%. Over the 3-year post-diagnosis interval, recurrent falls were reported by 21.8% of breast cancer survivors and 20.0% of controls over the same time period ( $P = 0.27$ ). Recurrent fall risk did not differ between breast cancer survivors and control women (OR 1.07, 95% CI 0.92-1.25), even after multi-variable adjustment.

**CONCLUSIONS:** In contrast to prior reports, older breast cancer survivors were not more likely to experience recurrent falls than age-matched counterparts. These findings underscore the need for incorporation of cancer-free control populations in survivorship studies to distinguish cancer sequelae from processes related to aging.

Language: en

### Keywords

Breast cancer; Comorbidity; Controls; Post-menopausal women; Survivorship; Women's health initiative

## **Bend don't break: stretching improves scores on a battery of fall assessment tools in older adults**

Johnson NF, Hutchinson C, Hargett K, Kosik K, Gribble P. J. Sport Rehab. 2020; ePub(ePub): ePub.

(Copyright © 2020, Human Kinetics Publishers)

**DOI** 10.1123/jsr.2019-0246 **PMID** 32087599

### **Abstract**

**CONTEXT:** Falls and loss of autonomy are often attributed in large part to musculoskeletal impairments in later adulthood. Age-related declines in flexibility contribute to late adulthood musculoskeletal impairment. The novel sitting-rising test has been proposed to be a quick, effective screening of musculoskeletal fitness, fall risk, and all-cause mortality in older adults. The timed up and go and 5 times sit-to-stand tests are two of the 3 most evidence-supported performance measures to assess fall risk.

**OBJECTIVE:** This study aimed to determine if 5 weeks of flexibility training could increase sitting-rising test, timed up and go, and 5 times sit-to-stand scores in community-dwelling older adults. **PARTICIPANTS:** Forty-seven adults aged 60 years and older (mean age = 66.7 y, SD = 4.1) participated in this study. Participants completed a static stretching protocol consisting of 3 weekly 1-hour stretching sessions.

**RESULTS:** The protocol improved flexibility as seen in sit-and-reach scores and improved scores on all outcome variables. Specifically, there was a significant increase in sitting-rising test scores from preintervention (M = 7.45, SD = 1.45) to postintervention (M = 8.04, SD = 1.36),  $t(42) = -5.21$ ,  $P < .001$ . Timed up and go scores demonstrated a significant decrease from preintervention (M = 8.85, SD = 1.32) to postintervention (M = 8.20, SD = 1.35),  $t(46) = 5.10$ ,  $P < .001$ . Five times sit-to-stand scores demonstrated a significant decrease from preintervention (M = 12.57, SD = 2.68) to postintervention (M = 10.46, SD = 2.06),  $t(46) = 6.62$ ,  $P < .001$ . Finally, significant increases in sit-and-reach scores were associated with improved functional performance ( $r = -.308$ ,  $P = .03$ ).

**CONCLUSION:** Findings suggest that flexibility training can be an effective mode of low-level exercise to improve functional outcomes. Static stretching may help to improve musculoskeletal health, promote autonomy, and decrease mortality in community-dwelling older adults.

Language: en

### **Keywords**

aging; flexibility; geriatric; mobility



## Dairy consumption and risk of falls in 2 European cohorts of older adults

Machado-Fragua MD, Struijk EA, Caballero FF, Ortolá R, Lana A, Banegas JR, Rodriguez-Artalejo F, López-García E. Clin. Nutr. 2020; ePub(ePub): ePub.

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### Abstract

**BACKGROUND & AIMS:** Some previous evidence have linked dairy products with greater muscle mass, bone mineral density and lower risk of osteoporosis. However, there is also evidence of a detrimental effect of milk on the risk of hip fracture. The aim of this study was to assess the prospective association between dairy consumption and risk of falls in older adults.

**METHODS:** We used data from 2 cohorts of community-dwellers aged  $\geq 60$ y: the Seniors-ENRICA cohort with 2981 individuals, and the UK Biobank cohort with 8927 participants. In the Seniors-ENRICA, dairy consumption was assessed with a validated diet history in 2008-10, and falls were ascertained up to 2015. In the UK Biobank study, dairy consumption was obtained with 3-5 multiple-pass 24-h food records in 2006-10, and falls were assessed up to 2016.

**RESULTS:** A total of 801 individuals in the Seniors-ENRICA and 201 in the UK Biobank experienced  $\geq 1$  fall. After adjustment for potential confounders, dairy products were not associated with risk of falls in the Seniors-ENRICA [hazard ratio (95% confidence interval) per 1-serving increment in total dairy consumption: 1.02 (0.93-1.11), milk: 0.93 (0.85-1.01), yogurt: 1.05 (0.96-1.15), and cheese: 0.96 (0.88-1.05)]. Corresponding figures in the UK Biobank were: total dairy: 1.19 (1.00-1.41), milk: 1.53 (1.13-2.08), yogurt: 1.10 (0.90-1.31), and cheese: 1.02 (0.87-1.22).

**CONCLUSIONS:** These results suggest a null association between habitual dairy consumption and the risk of falling in older adults. Whether milk consumption may increase the risk of falls, as observed in the UK Biobank cohort, merits further study.

Language: en

### Keywords

Cheese; Epidemiology; Milk; Older adults; Yogurt

## Depression, falls, and fractures

Afrin N, Honkanen R, Koivumaa-Honkanen H, Sund R, Rikkonen T, Williams L, Kroger H. Osteoporos. Int. 2020; ePub(ePub): ePub.

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### Abstract

[Abstract unavailable]

Language: en

## Detection of subtle gait disturbance and future fall risk in early multiple sclerosis

Brandstadter R, Ayeni O, Krieger SC, Harel NY, Escalon MX, Katz Sand I, Leavitt VM, Fabian MT, Buyukturkoglu K, Klineova S, Riley CS, Lublin FD, Miller AE, Sumowski JF. *Neurology* 2020; ePub(ePub): ePub.

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### Abstract

**OBJECTIVE:** To test the hypothesis that higher-challenge gait and balance tasks are more sensitive than traditional metrics to subtle patient-reported gait dysfunction and future fall risk in early multiple sclerosis (MS).

**METHODS:** Persons with early MS (n = 185; ≤5 years diagnosed) reported gait function (MS Walking Scale) and underwent traditional disability metrics (Expanded Disability Status Scale [EDSS], Timed 25 Foot Walk). Patients and healthy controls (n = 50) completed clinically feasible challenge tasks of gait endurance (2-Minute Walk Test), standing balance (NIH Toolbox), and dynamic balance (balance boards; tandem walk on 2 ten-foot boards of different widths, 4.5 and 1.5 in). MRI assessed global and regional brain volumes, total T2 lesion volume (T2LV), infratentorial T2LVs and counts, and cervical cord lesion counts. Falls, near falls, and fall-related injuries were assessed after 1 year. We examined links between all tasks and patient-reported gait, MRI markers, and fall data.

**RESULTS:** Patients performed worse on higher challenge balance, but not gait, tasks compared with healthy controls. Worse patient-reported gait disturbance was associated with worse performance on all tasks, but only dynamic balance was sensitive to mild patient-reported gait difficulty. Balance tasks were more correlated with MRI metrics than were walking tasks or EDSS score. Thirty percent of patients reported either a fall or near fall after 1 year, with poor dynamic balance as the only task independently predicting falls.

**CONCLUSIONS:** Balance plays a leading role in gait dysfunction early in MS. Clinically feasible higher-challenge balance tasks were most sensitive to patient-reported gait, MRI disease markers, and risk of future falls, highlighting potential to advance functional outcomes in clinical practice and trials.

Language: en

## Effects of aquatic physical intervention on fall risk, working memory and hazard-perception as pedestrians in older people: a pilot trial

Nissim M, Livny A, Barmatz C, Tsarfaty G, Berner Y, Sacher Y, Giron J, Ratzon NZ. BMC Geriatr. 2020; 20(1): e74.

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### Abstract

**BACKGROUND:** Normal aging is associated with balance, mobility and working memory decline that increase fall risk and influence activity of daily living functions. Mounting evidence suggests that physical activity is beneficial for decreasing aging effects. Previous studies have focused on land-based physical activity. Research concerning the aquatic environment is scarce. The primary objectives of this three arm intervention pilot study were to examine the effects of an aquatic physical intervention program on balance, gait, fall risk and working memory among community-dwelling older individuals. The secondary objective was to examine the effects of an aquatic physical intervention program on safety of street-crossing among community-dwelling older individuals.

**METHODS:** Forty-two healthy participants aged 65 or older were enrolled into one of three intervention groups: aquatic physical intervention (API) (N = 13), on-land physical intervention (OLPI) (N = 14) or non-physical intervention (NPI) (N = 15). The intervention took place from 2018 until 2019 at Tel-Aviv University, Sheba medical center and Reich Center. The protocol included 30-min sessions twice a week for 12 weeks. Balance, gait and fall risk were assessed by the Tinetti test, working memory abilities were assessed by digit span and Corsi blocks tests and simulated safe streets-crossing was assessed by the hazard perception test for pedestrians. Testing and data collection was conducted at baseline, after six weeks and 12 weeks of intervention. All members of the professional team involved in evaluating participants were blind to the intervention group to which participants were allocated.

**RESULTS:** The differences in Tinetti balance ( $F(2, 39)=10.03, p < 0.01$ ), fall risk ( $F(2, 39)=5.62, p > .05$ ), digit span forward ( $F(2, 39)=8.85, p < 0.01$ ) and Corsi blocks forward ( $F(2, 39)=3.54, p < 0.05$ ) and backward ( $F(2, 39)=6.50, p < 0.05$ ) scores after 12 weeks between the groups were significant. The API group showed improved scores. The differences in hazard perception test for pedestrians scores after 12 weeks of intervention between the groups were marginally significant ( $F(2, 39)=3.13, p = 0.055$ ). The API group showed improved scores.

**CONCLUSIONS:** These findings may affect experts working with the elderly population when making decisions concerning therapeutic prevention interventions for the deficiencies of elderly patients. Older adults practicing aquatic physical activity could contribute to their increased safety. **TRIAL REGISTRATION:** Trial registration number: ClinicalTrials.gov Registry NCT03510377. Date of registration: 10/31/2017.

Language: en

## **Factors that influence the risk of falling after spinal cord injury: a qualitative photo-elicitation study with individuals that use a wheelchair as their primary means of mobility**

Singh H, Scovil CY, Yoshida K, Oosman S, Kaiser A, Craven C, Jaglal S, Musselman KE. *BMJ Open* 2020; 10(2): e034279.

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### **Abstract**

**INTRODUCTION:** Falls are a concern for wheelchair users with spinal cord injury (SCI). Falls can negatively impact the physical and psychological well-being of fallers. To date, the perspectives of wheelchair users with lived experiences of SCI on the contributors to falls has been understudied. Information about factors that influence fall risk would guide the development of effective fall prevention strategies.

**OBJECTIVES:** To gain a comprehensive understanding of the factors that influenced the risk of falling as perceived by wheelchair users with SCI.

**DESIGN:** A qualitative study using photo-elicitation interviews. **SETTING:** A Canadian SCI rehabilitation hospital and the participants' home/community environments.

**PARTICIPANTS:** Twelve wheelchair users living in the community with chronic SCI.

**METHODS:** Participants captured photographs of situations, places or things that they perceived increased and decreased their risk of falling. Semistructured photo-elicitation interviews were conducted to discuss the content of the photographs and explore perceptions of fall risk factors. A hybrid thematic analysis and the Biological, Behavioural, Social, Economic, and Environmental model were used as a framework to organise/synthesise the data.

**RESULTS:** Overall, the findings indicated that the risk of falling was individualised, complex and dynamic to each person's life situation. Four main themes were revealed in our analysis: (1) Falls and fall risk caused by multiple interacting factors; (2) Dynamic nature of fall risk; (3) Single factors were targeted to reduce falls and fall-related injuries; and (4) Fall prevention experiences and priorities.

**CONCLUSIONS:** Each wheelchair user encountered numerous fall risk factors in their everyday lives. Information from this study can be used to set priorities for fall prevention. Fall prevention initiatives should consider a wheelchair user's fall risks in a holistic manner, acknowledging that a person's current situation, as well as anticipating their fall risks and fall prevention needs, will change over time.

Language: en

### **Keywords**

fall prevention; photo-elicitation; qualitative research; spinal cord injuries

## High prevalence of outpatient falls following elective shoulder arthroplasty

Sridharan MJ, Everhart JS, Frantz TL, Samade R, Neviasser AS, Bishop JY, Cvetanovich GL. J. Shoulder Elbow Surg. 2020; ePub(ePub): ePub.

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### Abstract

**BACKGROUND:** This study characterized the prevalence and risk factors of inpatient and outpatient postoperative falls in patients undergoing elective shoulder arthroplasty.

**METHODS:** A retrospective chart review of 198 patients undergoing anatomic or reverse total shoulder arthroplasty or hemiarthroplasties at one institution between 2015 and 2017 was reviewed to determine the prevalence of inpatient and outpatient falls up to 90 days after discharge. Univariate and multivariate analyses were conducted to assess potential risk factors for postoperative falls including demographics, indication for surgery, surgical procedure, medical history, length of hospital stay, perioperative hemoglobin, need for transfusion, and discharge disposition.

**RESULTS:** There were 23 falls in 22 patients within a 90-day postoperative period. The inpatient fall rate was 1.0% (2 of 198). The outpatient fall rate was 10.6% (21 of 198). Outpatient falls resulted in emergency department evaluation in 23.8% of cases (5 of 21), readmission in 19.0% (4 of 21), injury to an anatomic site other than the shoulder in 19.0% (4 of 21), and injury at the surgical site (eg, periprosthetic humeral fracture) in 4.8% (1 of 21). No significant risk factors were identified for inpatient falls. Independent risk factors for an outpatient fall were female sex (adjusted odds ratio [aOR] = 4.79; 95% confidence interval [CI]: 1.32, 17.4; P = .007), increased length of hospital stay (aOR = 1.23; 95% CI: 1.04, 1.45; P = .02), and history of a movement disorder (aOR = 7.20; 95% CI: 1.22, 42.6; P = .03).

**CONCLUSION:** A high outpatient fall rate of 10.6% within 90 days after discharge raises the concern that falls after shoulder arthroplasty are significantly higher than previously reported.

Language: en

### Keywords

Complications; hemiarthroplasty; injuries; inpatient; reverse total shoulder arthroplasty; risk factors

## **Incidence and circumstances of pediatric fall-related injuries: which fall variables matter?**

Baalmann M, Lu K, Ablah E, Lightwine K, Haan JM. Am. J. Surg. 2020; ePub(ePub): ePub.

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### **Abstract**

**BACKGROUND:** This study's purpose was to determine if age, fall height, fall mechanism, landing surface, and landing position are associated with injury severity and hospital outcomes among pediatric fall patients.

**METHODS:** A retrospective review was conducted of patients aged  $\leq 18$  years who sustained fall-related injuries admitted to an American College of Surgeons verified Level 1 trauma center from January 1, 2006 through December 31, 2015.

**RESULTS:** Patient age, fall mechanism, landing position, and landing surface were associated with the need for surgery. Patient age, fall mechanism, and landing position were also associated with intensive care unit admissions. Fall mechanism was the only variable associated with injury severity. No variables were associated with the need for mechanical ventilation or mortality.

**CONCLUSIONS:** Patient age, fall mechanism, landing surface, and landing position need to be considered with regard to injury severity and patient outcomes among pediatric fall patients.

Language: en

### **Keywords**

Fall variables; Hospital outcomes; Injury severity; Pediatric



## **Risk factors for postural and functional balance impairment in patients with chronic obstructive pulmonary disease**

Park JK, Deutz NEP, Cruthirds CL, Kirschner SK, Park H, Madigan ML, Engelen MPKJ. J. Clin. Med. 2020; 9(2): e609.

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### **Abstract**

Reduced balance function has been observed during balance challenging conditions in the chronic obstructive pulmonary disease (COPD) population and is associated with an increased risk of falls. This study aimed to examine postural balance during quiet standing with eyes open and functional balance in a heterogeneous group of COPD and non-COPD (control) subjects, and to identify risk factors underlying balance impairment using a large panel of methods. In COPD and control subjects, who were mostly overweight and sedentary, postural and functional balance were assessed using center-of-pressure displacement in anterior-posterior (AP) and medio-lateral (ML) directions, and the Berg Balance Scale (BBS), respectively. COPD showed 23% greater AP sway velocity ( $p = 0.049$ ). The presence of oxygen therapy, fat mass, reduced neurocognitive function, and the presence of (pre)diabetes explained 71% of the variation in postural balance in COPD. Transcutaneous oxygen saturation, a history of exacerbation, and gait speed explained 83% of the variation in functional balance in COPD. Neurocognitive dysfunction was the main risk factor for postural balance impairment in the control group. This suggests that specific phenotypes of COPD patients can be identified based on their type of balance impairment.

Language: en

### **Keywords**

Berg Balance Scale; COPD; functional balance; postural sway