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Falls, fractures and trauma

4 REFINE-*RE*DUCING *F*ALLS IN *IN*-PATIE*NT E*LDERLY USING BED AND CHAIR PRESSURE SENSORS IN ACUTE HOSPITAL CARE: A RANDOMISED CONTROLLED TRIAL

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Introduction: Advances in sensor technology afford innovative approaches to reducing falls in acute hospital care, however its clinical and cost-effectiveness has not been evaluated in a RCT.
Method: Pragmatic, parallel-arm, randomised controlled trial of bed and bedside chair pressure sensors (intervention group) compared to standard care (control group) to reduce inpatient falls in high risk elderly patients admitted to acute, general medical wards, in a large UK teaching hospital. The primary outcome measure was the number of in-patient bedside falls per 1,000 bed days.
Results: 1,839 participants were randomized (918 to the intervention group and 921 to the control group). There were 85 bedside falls (65 fallers) in the intervention group, with a falls rate of 8.71 per 1,000 bed days compared with 83 falls (64 fallers) in the control group, with a falls rate of 9.84 per 1,000 bed days (adjusted incidence rate ratio, 0.90; 95% confidence interval [CI], 0.66 to 1.22; $p = 0.5$). There was no significant difference between the two groups with respect to time to first fall (adjusted hazard ratio [HR], 0.95; 95% CI, 0.67 to 1.34; $p = 0.12$). The mean cost per patient in the intervention group was £7199 compared to £6400 in the control group, mean difference in QALYs per patient, 0.0001, not significant, (95% CI, −0.0006 to 0.0004, $p = 0.67$).
Conclusions: Bed and bedside chair pressure sensors as a single intervention strategy do not reduce in-patient bedside falls, time to first fall and are not cost effective in high risk elderly patients in acute, general medical wards.

83 THE IMPACT OF POSITIVE AFFECT ON FALLS AND FEAR OF FALLING IN THE OLDER ADULT POPULATION

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Background: Falling can have detrimental impacts both physically and psychologically on older people. Recent falls prevention guidelines from the American and British Geriatric Societies tend to minimise the psychological factors which contribute to falls risk. Previous studies have linked high positive affect to a reduced risk of stroke, myocardial infarction, mobility, disability, frailty and mortality. This study examined the impact of positive affect on falls and fear of falling.
Method: Trained field workers administered a computer-assisted personal interview (CAPI) to 8080 participants of The Irish Longitudinal Study on Ageing (TILDA), a population representative sample of community-dwelling people aged 50 and over. Positive affect was measured using the CES-D. Falls history and frequency in the past year was self-reported. Fear of falling was measured by asking participants whether they were afraid of falling, and if they limited activity due to fear of falling.
Results: The prevalence of high positive affect, low positive affect and depressive symptoms was 67.3%, 22.7% and 10.0% respectively. Adjusting for age and gender, ≥1 falls in the past year was independently and negatively associated with high positive affect compared to those with low positive (OR = 0.76, 95% CI: 0.66–0.89, $p < 0.001$) or depressive symptoms (OR = 0.51, 95% CI: 0.42–0.61, $p < 0.001$). Similarly participants rated as highly positive reported significantly less fear of falling than their low positive (OR = 0.67, 95% CI: 0.58–0.78, $p < 0.001$) or depressive counterparts (OR = 0.31, 95% CI: 0.25–0.38, $p < 0.001$). They were also less likely to restrict activity due to fear of falling ($p < 0.001$), High positive affect remained significantly and negatively associated with falls (OR = 0.61, 95% CI: 0.46–0.79, $p < 0.001$) among participants with and without fear of falling.
Conclusions: The findings of this study indicate positive older people were less likely to have a history of falls, underlining the role of positive affect in resilience and successful ageing.

84 WHICH FACTORS ARE ASSOCIATED WITH FEAR OF FALLING IN OLDER PEOPLE?

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Introduction: Fear of falling is common in older people. Its consequences include falling, loss of independence, restriction of activities and a reduction in quality of life. Understanding which factors are associated with fear of falling in older people will help identify those most at risk and provide guidance for the development of health care services and future fall prevention interventions.
Methods: Community dwelling older people aged 65+ were recruited from general practices in London, Nottingham and Derby. Participants answered questions on sociodemographic characteristics, completed instruments measuring fear of falling (Short FES-I), physical activity (CHAMPS), falls risk (FRAT), psychosocial variables (SF-12, LSNS, MSPSS) and were assessed for functional ability (Timed Up and Go and Romberg Static Balance test).
Results: 1088 participants completed questionnaires (62.9% female; mean age 72.9). High fear of falling (≥11 on the Short FES-I) was reported by 19.2%. Factors significantly associated with fear of falling on univariate analysis included: use of a walking aid (OR 9.20 (CI 5.95–14.22)), ability to use public transport easily (OR 8.61 (4.92–15.05)), aged over 80 (OR 3.35 (CI 2.22–5.07)), non-white ethnicity (OR 2.21 (CI 1.53–3.20)), routine and manual occupations (OR 1.99 (CI 1.33–2.99)), living alone (OR 1.98 (CI 1.41–2.76)), female (OR 1.47 (CI 1.08–1.99)), higher BMI (OR 1.07 (CI 1.04–1.11)), increased comorbidities (OR 1.31 (CI 1.19–1.43)) and medications (OR 1.19 (CI 1.13–1.25)). Falls risk (OR 6.82 (CI 4.07–11.42)), poorer mental health (OR 2.95 (1.77–4.91)) and social isolation (OR 1.73 (1.31–2.30) were associated with fear of falling. Moderate intensity exercise (exercising for ≥150 minutes/week) and better self-reported physical function on the SF-12 were associated with a lower odds of fear of falling (OR 0.19 (CI 0.13–0.28) and 0.11 (0.07–0.16) respectively).
Conclusions: Several factors have been identified which may help identify community dwelling older people who may benefit from interventions to reduce fear of falling.

85 HOW DO OLDER PEOPLE MAKE SENSE OF AND ACCOMMODATE FEAR OF FALLING IN EVERYDAY LIFE – A QUALITATIVE VIEW

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Introduction: Fear of Falling (FoF) is the most commonly reported fear among older adults (up to 50%) and can result in the avoidance of physical and social activities, potentially leading to loss of confidence, social isolation, increasing dependency, depression and decreased quality of life. To develop a psychological intervention to address FoF, we investigated how older people make sense of and accommodate fear of falling in their everyday lives.
Methods: We conducted in-depth qualitative interviews with patients (n = 13), informal carers (n = 2), and professionals working in a community falls prevention clinic (n = 5). Field notes from observation of patient consultations (n = 11) supplemented interview data. Thematic analysis was undertaken in data analysis workshops and facilitated through the use of qualitative analysis software (Nvivo).
Results: The way in which older people made sense of FoF was linked to the attributions they made between different types of falls (eg. 'traumatic' falls resulting in significant injury vs 'trips and slips' that undermine confidence) and concerns they expressed (eg. loss of independence; breaking bones; being unable to get up). FoF was accommodated in various ways, including: spatial-perceptual strategies (visual scanning and environmental monitoring); avoiding/modifying activities; using physical aids and props; pacing yourself; maintaining overall fitness & wellbeing; and ensuring help is at hand. Strategies suggested by formal and informal carers were sometimes rejected by older people as threatening their sense of identity.
Conclusion: Behavioural responses to FoF involve a complex interplay between experiences, fears, and attributions. Successful interventions to address FoF require detailed individual assessment to develop tailored strategies which also support identity.

86 FEAR OF FALLING IN AN OLDER IRISH POPULATION: PREVALENCE AND PSYCHOSOCIAL PREDICTORS

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Introduction: Fear of falling (FOF) is an important and common syndrome affecting older adults. FOF may lead to activity avoidance, functional decline, restriction of social participation, decreased quality of life, increased risk of falling and institutionalisation. The reported prevalence of FOF in community-dwelling older persons ranges from 20.8% to 85.4%, however there is a lack of nationally representative data. The link between anxiety and FOF merits attention as it is possible that these two conditions are two different manifestations of the same disease.
Methods: A nationally representative sample of 8166 adults aged ≥50 years took part in wave 1 of The Irish Longitudinal Study of Ageing (TILDA). Structured interviews were conducted in the respondents' homes using computer-aided personal interviewing (CAPI). FOF was measured by asking respondents "Are you afraid of falling?" Respondents self-reported the number of falls experienced over a 12 month period.
Depression was assessed using the CES-D 20 and anxiety using the HADS-A. Generalised fear was captured as part of the CES-D.
Results: Mean age 63.83 ± 9.79. The overall prevalence of FOF was 23.3% and increased with age. At all ages FOF was more prevalent in women than men. Multivariate associations of FOF were female gender (OR 2.81), older age (OR 2.63), anxiety (OR 1.91), poor self-rated health (OR 1.74), generalised fear (OR 1.81), higher number of chronic conditions (OR 2.10) and history of falls (OR 2.69).

Conclusion: FOF is independently associated with many socio-demographic, psychological and physical health status measures. Given its prevalence and importance, questions to assess FOF should be incorporated into the clinical assessment of all older adults.

87 THE VALUE OF BRAIN NATRIURETIC PEPTIDE (BNP) IN PREDICTING THE RESULT OF TILT TABLE TESTING IN OLDER PATIENTS

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Introduction: Tilt table testing is used in the investigation of syncope, however it is labour and time-intensive. Brain Natriuretic Peptide (BNP) has been suggested as a marker to help elucidate the cause of the syncopal episode (Tanimoto K et al. Am J Cardiol 2004 93:228). The aim of the overall study was to determine whether BNP could predict the outcome of a tilt table test and therefore possibly reduce the need for tilt table testing in some patients. The results of the participants aged 65 years and older are presented here.
Methods: All patients who fulfilled the indications for tilt table testing who presented to the syncope clinic were potentially eligible for the study. Patients were excluded if they did not/could not give written consent to participate or had a medical condition that has been associated with a raised BNP level. A blood sample to measure BNP was taken in the supine position 15 minutes after the tilt table test had finished and when the participant's heart rate and blood pressure were normal for them.
Results: 25 older patients were eligible for analysis during the study period of which 52% were male. The median age of the subgroup was 77 years (range 65-86). 15 patients had a positive tilt test as per European Society of Cardiology guidelines – all had a vasodepressor response. The mean BNP level for patients with a positive tilt table test was 40.3 pg/ml (95% confidence interval (CI) 26.08–54.52), whilst the mean BNP level for patients with a negative tilt table test was 34.6 pg/ml (95% CI 17.46–51.74). There was no statistical difference between the two groups ($p = 0.55$).
Conclusion: BNP level by itself is not helpful when attempting to predict whether a tilt table test will be positive in an older patient with unexplained syncope.

88 PREVALENCE OF SYNCOPE IN OLDER ADULTS WITH DEPRESSION: A POPULATION BASED STUDY

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Introduction: Syncope is a common problem which increases in older age groups. In syncope clinics, patients who are depressed have higher rates of unexplained and recurrent syncope. Studies exploring the association of syncope and depression in community dwelling older populations are lacking. We aim to examine the rates of depression in older patients reporting syncope and the effect of anti-depressants on the rates of syncope.
Methods: Data was extracted from the Irish Longitudinal Study on Ageing (TILDA), which includes 8,175 adults aged 50 and older, living in the community in Ireland.

The Centre for Epidemiological Studies Depression scale (CES-D) was used to assess levels of depression. Syncope was assessed by self-reported questionnaires. Multinomial regression was used to analyse the data with a p value of <0.05 determining significance.
Results: 8,175 participants aged 50 and older were assessed. 227 patients reported at least one syncopal episode in the last year. Patients with moderate and severe depression had a greater likelihood of syncope (RR 1.99 and 2.82, respectively $p < 0.010$). When corrected for age and co-morbidities, depressed patients treated with tricyclic antidepressants (TCAs) were more likely to have a syncopal episode in the last year (RR 2.25, $p < 0.050$). Patients on selective serotonin re-uptake inhibitors (SSRIs) had a higher risk of syncope but this failed to reach statistical significance.
Conclusions: This study demonstrates an increased risk of syncope in older patients with depression. TCAs carry a greater risk for syncope than SSRIs. As a cross sectional survey this study is not able to demonstrate causation and further work is warranted to investigate the underlying causes for syncopal disorders in depression.

90 VISION, FALLS AND FEAR OF FALLING IN AN OLDER IRISH POPULATION: FINDINGS FROM THE IRISH LONGITUDINAL STUDY ON AGEING (TILDA)

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Introduction: Falls are a serious health concern for older people and a major health care cost. Fear of falling is a strong risk factor for falls. The relative role of vision in falls and fear of falling is still a matter of debate. The aim of this study was to determine if impaired visual acuity or contrast sensitivity is significantly associated with a history of falls and/or fear of falling in older adults.
Methods: N = 4914 individuals were recruited as part of The Irish Longitudinal Study on Ageing (TILDA). In the TILDA health assessment both visual acuity and contrast sensitivity were measured. Participants were asked about their history of falls and fear of falling in the interview.
Results: Visual Acuity was not significantly different between fallers and non-fallers (0.05 vs. 0.06 LogMAR; $p = 0.54$). There was no significant difference in contrast sensitivity between fallers and non-fallers. Those with a fear of falling had significantly lower contrast scores ($P < 0.001$). Following multivariate analysis age and gender were found to account for this difference.
Conclusion: Falls are a multifactorial and heterogeneous health issue in older people. Traditionally eyesight has been considered a risk factor for falls. These results may suggest otherwise, however future longitudinal analysis will reveal the true interaction between the factors. Our results would suggest that single interventions are unlikely to reduce falls alone and individually tailored interventions are likely to be most effective in reducing falls. It was found that fear of falling is three times more common in women than men in the older Irish population. Research to investigate why this is the case and therapies to alleviate this are necessary.

91 COGNITIVE PROCESSES ASSOCIATED WITH FUNCTIONAL MOBILITY IN OLDER ADULTS

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Introduction: The Timed Up-and-Go (TUG) test is a functional mobility test, recommended for falls assessment in older adults. Global cognitive deterioration and reduced executive function independently predict poorer TUG performance; research examining associations with other cognitive domains is lacking. This study examined the cross-sectional associations between global cognition, executive function, processing speed, attention, memory and TUG in a population-based study.
Methods: A nationally representative sample of community dwelling adults (50+ years) took part in Wave 1 of TILDA. Participants (n = 5845) completed an interview (which contained sociodemographic, health and psychological questions) and a health assessment which included mobility (TUG) and cognition. Cognitive assessment included global cognition (MMSE, MOCA), processing speed (choice reaction time), attention (sustained attention reaction time [SART]), executive function (colour trails test, verbal fluency, visual reasoning), and memory tests (prospective memory, immediate and delayed word recall, picture memory). Linear regression was used to examine whether each cognitive test was independently associated with TUG performance after adjusting for age, height, sex, BMI, education, chronic conditions, medications and depressive symptoms. Statistical tests took place in Stata; significance was set at $p < 0.05$.
Results: Multivariate regression analysis indicated that all cognitive tests except picture memory test were significantly associated with TUG after adjusting for covariates ($p < 0.05$). When all cognitive tests were entered into the model simultaneously, cognitive reaction time, letter fluency, Colour Trail 1, mean SART and prospective memory remained significantly associated with TUG.
Conclusions: These results highlight strong associations between a decline in all domains of cognitive function and poorer TUG performance. Clinically, an individual who presents with slow TUG should be referred for comprehensive geriatric screening to include cognitive assessment.

92 THE ASSOCIATION BETWEEN VITAMIN D DEPLETION AND BERG BALANCE SCORE IN SUBJECTS ATTENDING A FALLS CLINIC

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Introduction: Vitamin D's actions are diverse and include roles in muscle function, balance and gait. The Berg Balance Scale is a tool that allows objective measurement of balance. It is a 56-point scale and allows stratification of falls risk. Levels less than 40 are associated with elevated falls risk. We hypothesised that in patients with falls, impaired vitamin D status may be associated with a low Berg score, and higher falls risk due to impaired balance.
Methods: Berg scores were categorised into groups with higher risk of falls (0–39) and lower risk of falls (40–56). Impaired vitamin D status was defined below 75 nM/L. Data were subjected to Chi-Squared analysis.
Results: There were 97 male (mean age 80.7) and 173 female (mean age 79.9) fallers. Age range: 52–99. Berg score range: 7–56.

	Low Berg Score (0–39)			High Berg Score (40–56)		
	Impaired Vitamin-D	Normal Vitamin-D	Total	Impaired Vitamin-D	Normal Vitamin-D	Total
Males (97)	33 (70%)	14 (30%)	47	40 (80%)	10 (20%)	50
Females (173)	68 (72%)	27 (28%)	95	47 (60%)	31 (40%)	78

In males with high and low Berg scores there was no significant difference in impaired vitamin D status (80% v 70%, $\chi^2 = 2.81$; $P = 0.093$). In females with low Berg scores versus those with high Berg scores, impaired vitamin D status was significantly more common (72% v 60%, $\chi^2 = 5.31$; $P = 0.021$).

Conclusion: Impaired vitamin D status is common amongst fallers of both sexes, but appears to be more closely linked to low Berg score (and hence impaired balance) in women than men.