Welcome

This issue features:

- April Falls Day 2015 - Resources
- Tai Chi and falls prevention mini-review
- Websites, Meetings and Conferences
- Recent Abstracts from the research literature

“Falls Prevention is everyone’s business®”

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FOR YOUR DIARY:

ANZFPS Conference
16-18 November 2014
Luna Park Sydney
April Falls Day®/Month 2015

Theme: Confusion and Falls Prevention

A day for your Health Service to promote Falls Prevention messages to:

- Staff and Patients,
- Families and Carers,
- Community Services and
- General Community

Patients who are confused are at greater risk of falling in hospital, in the community and in residential aged care.

The Clinical Excellence Commission’s (CEC) Falls Prevention Program is leading a working group that will develop a suite of resources on confusion and falls, which will be available in early 2015.

History of April Falls Day®

April Falls Day® was initiated in the former Northern Sydney Central Coast Area Health Service (NSCCAHS) to promote falls prevention best practice with staff, community service providers and the general community.
The CEC has supported April Falls Day® since the 1st April 2008 and has arranged for the day/month to be gazetted in the NSW Health Calendar.

Promotional material: Order now

April Falls Day®/Month products such as Sticky note pads, t-shirts, balloons, lens cloths and pens will be available to order through Good Gear. Information will be sent out via the NSW Falls Prevention Network email list.

If you would like to discuss April Falls Day please contact Ingrid Hutchinson E: ingrid.hutchinson@health.nsw.gov.au or Ph: 02-9269 5516.

Falls Prevention is everyone’s business®
Effectiveness of Tai Chi in preventing falls and improving balance

Dr Esther Vance and Professor Stephen Lord, Falls and Balance Research Group, NeuRA

Falls continue to be a health issue for older people. One third of community dwelling older people falls each year with 10% of falls leading to injuries that require admission to hospital [1, 2]. Fall-related hospitalisations are increasing at a rate of 3.8% per year for those aged over 65 years, placing an increasing burden on the health care system [3, 4]. In response to this health care need, considerable research has been undertaken to identify pragmatic fall prevention strategies.

One of the strategies extensively evaluated is exercise and systematic reviews have shown that exercise regimes that challenge balance are effective in preventing falls in older people living in the community [5, 6]. Further, it has been found that exercise interventions have maximal benefits if they include at least 2 hours exercise per week and continue for at least 26 weeks [7].

Tai Chi uses slow, sustained smooth and rhythmical movements of the trunk and limbs whilst keeping the centre of mass in a balanced state. It therefore challenges balance and meets the criteria of highly challenging balance exercise necessary for effective falls prevention ([7, 8] 2011). Tai Chi has also been found to be a cost effective strategy [9] and Tai Chi classes have been successfully led by trained volunteers in some NSW Health Districts (Southern NSW, Murrumbidgee and Western NSW). Tai Chi has been researched as a physical activity fall prevention strategy for older people for over 20 years with the seminal study by Wolf and colleagues on Tai Chi to reduce frailty and falls (part of the FICSIT study) published in 1993 [10]. This pioneering study found that a 15 week Tai Chi intervention significantly reduced falls and fear of falling and improved balance control.

This mini review provides a summary of the findings of the reviews that have investigated the effectiveness of Tai Chi to prevent falls and/or improve balance in community dwelling people over 50 years of age. Information on the included reviews is summarised in Table 1.

The reviews conducted to date have included varying numbers of studies depending on their inclusion criteria with some reviews including only randomised controlled trials (RCTs) whereas others have also included pre and post-test studies, cross-sectional and quasi-experimental studies. Not all reviews included a meta-analysis of the results. The main factors differing among the trials include the mix of populations and ages, different styles of Tai Chi and length of intervention, total duration of intervention (varying from 3 – 52 weeks) and number of exercise sessions per week (20 min to 90 min, up to 3 times per week), frailty status of participants and type of control group (i.e. exercise, education or no exercise). These study discrepancies as well as differing review study inclusion criteria have led to some reviews concluding Tai Chi reduces falls and improves balance whereas others have considered the evidence too weak to support such claims (see Table 1).

Cochrane Reviews are considered the gold standard by many researchers, and the 2012 Cochrane Review on fall prevention interventions in the community reported that from 7 RCTs included in their analysis, Tai Chi reduced the rate of falls (Rate Ratio [RaR] 0.72, 95% CI 0.52 – 1.00) and the risk of falling (Relative Risk [RR] 0.71, 05% CI 0.57 – 0.87) [5]. However, there was substantial heterogeneity in these findings and a subgroup analysis found the treatment effect was greater in older people who did not have a high risk of falling [5].
Other complementary systematic reviews have also only included RCTs [11-14]. These have reported more equivocal findings with some concluding that there is insufficient evidence that Tai Chi is effective in preventing falls, decreasing fear of falling and improving balance in people in the community over 50 years of age [12, 14]. Other RCT reviews found that Tai Chi was effective in reducing falls or falls risk in younger healthier participants but not in older frailer participants where the Tai Chi intervention increased the risk of falls [11, 13].

Several systematic reviews have included cross sectional and pre post studies as well as RCTs [15-17]. They concluded that the majority of studies demonstrated reductions in total number of falls and fear of falling (FOF), significant improvement in laboratory measures of dynamic balance but less consistent benefits for measures of functional balance. They also noted that balance improvements were equivalent to/no better than programs that included functional balance and resistance training. They identified a number of factors that were associated with improvements; using the style of Tai Chi that was compatible with the participant’s abilities, the duration of the program and method of delivery, social compatibility and previous activity levels of participants.

As the reviews have included studies that have been heterogeneous and variable in their quality and inclusion criteria, it might also be insightful to summarise three of the better quality RCTs that have included falls as the primary outcome measure. These studies included large samples (256-702) with participants attending Tai Chi programs 1-3 hours per week for 16-26 weeks with control groups including stretching exercise, low level exercise or being on a waiting list [18-20]. Two of these studies found the Tai Chi programs were effective in reducing falls and improving balance in mainly healthy older community dwellers [19, 20]. One study found there was no difference between the Tai Chi group and the low level exercise group (this included mainly seated stretching and low level strength and cardiovascular exercises) with a similar falls reduction over a 17 month follow up period [18].

A recent integrative review by Hackney & Wolf [8] concluded that interventions such as Tai Chi had an impact on balance in older adults as this type of training involves gait, balance, coordination, functional exercise and muscle strengthening. Their caveat was that adherence was critical to achieving improvement in balance and mobility [8]. Finally, an overview of systematic reviews of Tai Chi for a range of conditions including falls prevention concluded that three of the included studies showed positive effects on preventing falls whereas one study did not [21]. Their overall conclusion was that Tai Chi was effective in preventing falls in older people.

In conclusion, there have been a large number of studies and reviews on the effectiveness of Tai Chi on balance control and fall prevention. The studies conducted have been very heterogeneous in design and therefore have provided a range of results. Overall, it appears that Tai Chi is effective in reducing falls and improving balance in general (non-frail) populations of older community dwelling people. As with all exercise interventions, long term adherence appears necessary for effective fall prevention. Tai Chi has also been found to be a cost effective in this population and therefore can be recommended as an evidence-based intervention for this group.
References

4. AIHW and B. C, Hospitalisations due to falls by older people, Australia 2009-10, in Injury research and statistics series no 70. 2013, AIHW: Canberra.
<table>
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<th>Reference</th>
<th>No of RCTs and other studies included</th>
<th>Quality of RCT and other studies</th>
<th>Meta-analysis</th>
<th>Review Conclusion</th>
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<tr>
<td>Jimenez-Martin et al 2013 [22]</td>
<td>27 RCTs</td>
<td>variable</td>
<td>no</td>
<td>Tai Chi Chuan improves static and dynamic balance and functional factors affecting balance in persons &gt; 55 years</td>
</tr>
<tr>
<td>Schliecher, Weddam &amp; Wu 2012 [16]</td>
<td>14 RCTs (5 cross sectional &amp; 5 pre/post-test designs)</td>
<td>variable</td>
<td>no</td>
<td>Majority of studies demonstrated reductions in total number of falls, fear of falling and significant improvement in lab based balance measures</td>
</tr>
<tr>
<td>Gillespie et al 2012 [5]</td>
<td>7 RCTs</td>
<td>Good quality</td>
<td>yes</td>
<td>Tai Chi reduces the risk of falling overall but is less effective in people at higher risk of falling</td>
</tr>
<tr>
<td>Leung et al 2011 [12]</td>
<td>13 RCTs</td>
<td>Good quality (PeRo score &gt;6)</td>
<td>yes</td>
<td>Tai Chi improved balance and reduced falls in non-frail older people and equivalent to / no better than stretching exercise or wellness education program</td>
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<tr>
<td>Logghe et al 2010 [14]</td>
<td>9 RCTs</td>
<td>Good quality</td>
<td>yes</td>
<td>Compared with exercise controls Tai Chi participants showed significant improvements in fall rates and static balance, however when compared with non-exercise controls no improvement was found with Tai Chi in fall rates or static balance but there was a significant improvement in fear of falling.</td>
</tr>
<tr>
<td>Liu &amp; Frank 2010 [15]</td>
<td>15 RCTs, 3 pre/post test</td>
<td>Good quality</td>
<td>no</td>
<td>Tai Chi improved balance and balance confidence in non-frail older adults</td>
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<tr>
<td>Gregory &amp; Watson 2009 [11]</td>
<td>7 RCTs</td>
<td>variable</td>
<td>no</td>
<td>Tai Chi Chuan was effective in reducing fall risk in healthy older people but not for frailer older people</td>
</tr>
<tr>
<td>Low et al 2009 [13]</td>
<td>7 RCTs</td>
<td>Good</td>
<td>no</td>
<td>About half the studies showed that Tai Chi was effective in fall reduction particularly in less frail population</td>
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Websites, Meetings & Conferences

Kings Fund

Developing supportive design for people with dementia

To support clinical and care staff, managers and estates colleagues, The King’s Fund UK has produced a range of resources to enable hospitals, care homes, primary care premises and specialist housing providers to become more dementia friendly.

Is your ward dementia friendly? Is your hospital dementia friendly? – one tool for use in wards and clinical areas and the other for areas such as Outpatients

Is your care home dementia friendly? – for use in care homes or residential care facilities

Is your health centre dementia friendly? – for use in health centres and GP premises

Is your housing dementia friendly? – for use in any ‘housing with care’ setting including extra care housing, retirement communities, sheltered housing and very sheltered housing of any tenure

CONFERENCE

Australian and New Zealand Falls Prevention Society

6th Biennial Australasian Falls Prevention Conference, Sydney, 16-18 November 2014

http://www.anzfpconference.com.au

The Highs and Lows of Falls Prevention

The Australian and New Zealand Falls Prevention Society 6th Biennial Conference will be held at Luna Park Sydney NSW, 16th – 18th November. An exciting program is being developed, with the following high profile speakers already confirmed:

- Professor Stephen Robinovitch, Simon Fraser University, Canada
- Professor Jeffrey Hausdorff, Tel Aviv Sourasky Medical Center, Israel
- Dr Anna Barker, Monash University
- Professor Adrian Bauman, University of Sydney
- Professor Henry Brodaty, University of New South Wales
- Associate Professor Lesley Day, Monash University
- Dr Anne-Marie Hill, Notre Dame University
- Dr Jasmine Menant, Neuroscience Research Australia
- Dr Sabrina Pit, University of Sydney
- Professor Cathie Sherrington, University of Sydney
- Dr Monag Taylor, Prince of Wales Clinical School
- Ms Caroline Gall, Manager Public Insurance, Accident Compensation Corporation, NZ

For further information see the website or contact conference organisers – East Coast Conferences Phone: (+61 2) 6650 9800 or email fallsconference@eastcoastconferences.com.au

www.anzfpconference.com.au
Predicting geriatric falls following an episode of emergency department care: a systematic review
Carpenter CR, Avidan MS, Wildes T, Stark S, Fowler SA, Lo AX.
Affiliation: The Division of Emergency Medicine, St. Louis, MO.
(Copyright © 2014, Society for Academic Emergency Medicine, Publisher John Wiley and Sons)

Abstract
BACKGROUND: Falls are the leading cause of traumatic mortality in geriatric adults. Despite recent multispecialty guideline recommendations that advocate for proactive fall prevention protocols in the emergency department (ED), the ability of risk factors or risk stratification instruments to identify subsets of geriatric patients at increased risk for short-term falls is largely unexplored.

OBJECTIVES: This was a systematic review and meta-analysis of ED-based history, physical examination, and fall risk stratification instruments with the primary objective of providing a quantitative estimate for each risk factor’s accuracy to predict future falls. A secondary objective was to quantify ED fall risk assessment test and treatment thresholds using derived estimates of sensitivity and specificity.

METHODS: A medical librarian and two emergency physicians (EPs) conducted a medical literature search of PUBMED, EMBASE, CINAHL, CENTRAL, DARE, the Cochrane Registry, and Clinical Trials. Unpublished research was located by a hand search of emergency medicine (EM) research abstracts from national meetings. Inclusion criteria for original studies included ED-based assessment of pre-ED or post-ED fall risk in patients 65 years and older with sufficient detail to reproduce contingency tables for meta-analysis. Original study authors were contacted for additional details when necessary. The Quality Assessment Tool for Diagnostic Accuracy Studies (QUADAS-2) was used to assess individual study quality for those studies that met inclusion criteria. When more than one qualitatively similar study assessed the same risk factor for falls at the same interval following an ED evaluation, then meta-analysis was performed using Meta-DiSc software. The primary outcomes were sensitivity, specificity, and likelihood ratios for fall risk factors or risk stratification instruments. Secondary outcomes included estimates of test and treatment thresholds using the Pauker method based on accuracy, screening risk, and the projected benefits or harms of fall prevention interventions in the ED.

RESULTS: A total of 608 unique and potentially relevant studies were identified, but only three met our inclusion criteria. Two studies that included 660 patients assessed 29 risk factors and two risk stratification instruments for falls in geriatric patients in the 6 months following an ED evaluation, while one study of 107 patients assessed the risk of falls in the preceding 12 months. A self-report of depression was associated with the highest positive likelihood ratio (LR) of 6.55 (95% confidence interval [CI] = 1.41 to 30.48). Six fall predictors were identified in more than one study (past falls, living alone, use of walking aid, depression, cognitive deficit, and more than six medications) and meta-analysis was performed for these risk factors. One screening instrument was sufficiently accurate to identify a subset of geriatric ED patients at low risk for falls with a negative LR of 0.11 (95% CI = 0.06 to 0.20). The test threshold was 6.6% and the treatment threshold was 27.5%.

CONCLUSIONS: This study demonstrates the paucity of evidence in the literature regarding ED-based screening for risk of future falls among older adults. The screening tools and individual characteristics identified in this study provide an evidentiary basis on which to develop screening protocols for geriatrics adults in the ED to reduce fall risk.

The effect of interactive cognitive-motor training in reducing fall risk in older people: a systematic review
Schoene D, Valenzuela T, Lord SR, de Bruin ED.
(Copyright © 2014, BioMed Central)

Abstract
BACKGROUND: It is well-known physical exercise programs can reduce falls in older people. Recently, several studies have evaluated interactive cognitive-motor training that combines cognitive and gross motor physical exercise components. The aim of this systematic review was to determine the effects of these interactive...
cognitive-motor interventions on fall risk in older people.

METHODS: Studies were identified with searches of the PubMed, EMBASE, and Cochrane CENTRAL databases from their inception up to 31 December 2013. Criteria for inclusion were a) at least one treatment arm that contained an interactive cognitive-motor intervention component; b) a minimum age of 60 or a mean age of 65 years; c) reported falls or at least one physical, psychological or cognitive fall risk factor as an outcome measure; d) published in Dutch, English or German. Single case studies and robot-assisted training interventions were excluded. Due to the diversity of populations included, outcome measures and heterogeneity in study designs, no meta-analyses were conducted.

RESULTS: Thirty-seven studies fulfilled the inclusion criteria. Reporting and methodological quality were often poor and sample sizes were mostly small. One pilot study found balance board training reduced falls and most studies reported training improved physical (e.g. balance and strength) and cognitive (e.g. attention, executive function) measures. Inconsistent results were found for psychological measures related to falls-efficacy. Very few between-group differences were evident when interactive cognitive-motor interventions were compared to traditional training programs.

CONCLUSIONS: The review findings provide preliminary evidence that interactive cognitive-motor interventions can improve physical and cognitive fall risk factors in older people, but that the effect of such interventions on falls has not been definitively demonstrated. Interactive cognitive-motor interventions appear to be of equivalent efficacy in ameliorating fall risk as traditional training programs. However, as most studies have methodological limitations, larger, high-quality trials are needed.

Epidemiology

Falls among the elderly: risk factors in a population-based study

Rodrigues IG, Fraga GP, Barros MB.


Affiliation: School of Medical Sciences, Department of Public Health, Universidade Estadual de Campinas, Campinas, SP, Brazil.

(Copyright © 2014, Associacao Brasileira de Pos-Graduacao em Saude Coletiva)

Abstract

PURPOSE: The aim of the present study was to identify factors associated with the occurrence of falls among elderly adults in a population-based study (ISACamp 2008).

METHODS: A population-based cross-sectional study was carried out with two-stage cluster sampling. The sample was composed of 1,520 elderly adults living in the urban area of the city of Campinas, São Paulo, Brazil. The occurrence of falls was analyzed based on reports of the main accident occurred in the previous 12 months. Data on socioeconomic/demographic factors and adverse health conditions were tested for possible associations with the outcome. Prevalence ratios (PR) were estimated and adjusted for gender and age using the Poisson multiple regression analysis.

RESULTS: Falls were more frequent, after adjustment for gender and age, among female elderly participants (PR = 2.39; 95% confidence interval (95%CI) 1.47 - 3.87), elderly adults (80 years old and older) (PR = 2.50; 95%CI 1.61 - 3.88), widowed (PR = 1.74; 95%CI 1.04 - 2.89) and among elderly adults who had rheumatism/arthritis/arthrosis (PR = 1.58; 95%CI 1.00 - 2.48), osteoporosis (PR = 1.71; 95%CI 1.18 - 2.49), asthma/bronchitis/emphysema (PR = 1.73; 95%CI 1.09 - 2.74), headache (PR = 1.59; 95%CI 1.07 - 2.38), mental common disorder (PR = 1.72; 95%CI 1.12 - 2.64), dizziness (PR = 2.82; 95%CI 1.98 - 4.02), insomnia (PR = 1.75; 95%CI 1.16 - 2.65), use of multiple medications (five or more) (PR = 2.50; 95%CI 1.12 - 5.56) and use of cane/walker (PR = 2.16; 95%CI 1.19 - 3.93).

CONCLUSION: The present study shows segments of the elderly population who are more prone to falls through the identification of factors associated with this outcome. The findings can contribute to the planning of public health policies and programs addressed to the prevention of falls.
High prevalence of falls, fear of falling, and impaired balance in older adults with pain in the United States: findings from the 2011 National Health and Aging Trends Study


Affiliation: Center for Pain Research on Impact, Measurement and Effectiveness, Department of Anesthesiology and Pain Medicine, University of Washington, Seattle, Washington.

Copyright © 2014, John Wiley and Sons

Abstract

OBJECTIVES: To determine the prevalence of clinically relevant falls-related outcomes according to pain status in older adults in the United States.

DESIGN: Cross-sectional analysis of the 2011 National Health and Aging Trends Study, a sample of Medicare enrollees aged 65 and older (response rate 71.0%).

SETTING: In-person assessments were conducted in the home or residential care facility of the sampled study participant.

PARTICIPANTS: Individuals aged 65 and older (n = 7,601, representing 35.3 million Medicare beneficiaries).

MEASUREMENTS: Participants were asked whether they had been "bothered by pain" and the location of pain, as well as questions about balance and coordination, fear of falling, and falls.

RESULTS: Fifty-three percent of the participants reported bothersome pain. The prevalence of recurrent falls in the past year (≥2 falls) was 19.5% in participants with pain and 7.4% in those without (age- and sex-adjusted prevalence ratio (PR) = 2.63, 95% confidence interval (CI) = 2.28-3.05). The prevalence of fear of falling that limits activity was 18.0% in those with pain and 4.4% in those without (adjusted PR = 3.98, 95% CI = 3.24-4.87). Prevalence of balance and falls outcomes increased with number of pain sites. For example, prevalence of problems with balance and coordination that limited activity was 6.6% in participants with no pain, 11.6% in those with one site of pain, 17.7% in those with two sites, 25.0% in those with three sites, and 41.4% in those with four or more sites (P < .001 for trend). Associations were robust to adjustment for several potential confounders, including cognitive and physical performance.

CONCLUSION: Falls-related outcomes were substantially more common in older adults with pain than in those without. Accordingly, pain management strategies should be developed and evaluated for falls prevention.

Gender difference in falls among adults treated in emergency departments and outpatient clinics


Affiliation: Director of Clinical Informatics and Innovation, University of Arkansas for Medical Sciences Medical Center, USA.

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Abstract

BACKGROUND: This study examined the impact of gender on age-related increase for falls and injurious falls resulting in head injuries/fractures among adults, using data from both emergency department and clinic visits. We also estimated the percentages of falls treated in points of entry outside of emergency departments.

METHODS: The study population consisted of 259,611 adults seen at emergency department, inpatient, and/or outpatient facilities between January, 2007 and June, 2012 at a US medical center. Rates of falls and injurious falls with head injuries/fractures were calculated by age and gender.

RESULTS: After using both emergency department and clinic visit data, medically consulted falls and injurious falls resulting in head injuries/fractures increased with age for females aged ≥ 18 years. For males, these rates declined, reached the lowest point at age of 65-74, and then increased again. Thirty-nine percent of females and 63% of males treated their falls in clinics, instead of emergency departments.
CONCLUSION: Gender disparity of medically consulted falls and related injuries exits among adults. Age and gender targeted fall injury prevention interventions need further development. Significant numbers of fall-related injuries were treated at clinics; future research is needed to determine whether fall injury surveillance should be expanded to include outpatient clinics.

Fear of Falling

Effect of balance training on balance and confidence in older adults

Taheri HR, Asl FB, Sohrabi M, Kakhki AS.


(Copyright © 2014, Firat University, College of Physical Education and Sport Science)

**Abstract**

Balance training may can the prevalence of falls and increase confidence. The purpose of this study is Effect of balance training on balance and confidence in older adults. In this study 15 older adults (over 65 years old) participated in eight weeks exercise. MMSE, BBS, MFES, BES, CS and 8-foot-up-and-go record were collected before and after intervention. A repeated measures ANOVA was utilized to determine whether a significant change occurred over time and statistical significance was assessed at (p<0.05) level. The results indicated that the experimental group for BBS, MMSE, 8 foot-up-and-go, BES and CS variables achieved a significant improvement in balance from pre- testing to post-testing. Improvement for control group was not significant. These findings provide evidence that while all physical activity could improve balance may be necessary to promote the greatest improvements in balance.

How fear of falling can increase fall-risk in older adults: applying psychological theory to practical observations

Young WR, Mark Williams A.


Affiliation: Centre for Sports Medicine and Human Performance, Brunel University, UB83PH, UK.

(Copyright © 2014, Elsevier Publishing)

**Abstract**

It is widely reported that fear of falling (FOF) has a profound and largely detrimental effect on balance performance in older adults. However, the mechanisms by which FOF influence postural stability are poorly understood. In the current article, we use psychological theory to explain FOF-related changes to postural control. First, we review literature describing associations between FOF and the ‘stiffening’ strategies observed during control of posture, including observations of eye and head movements. Second, we present a framework illustrating the interactions between increased age, FOF, and altered attentional processes, which in turn influence balance performance and fall-risk. Psychological theory predicts that anxiety can cause attentional bias for threatening and task-irrelevant stimuli and compromise the efficiency of working memory resources. We argue that while the adoption of stiffening strategies is likely to be beneficial in avoiding a loss of balance during simple postural tasks, it will ultimately compromise performance in dynamic and highly demanding functional tasks. The adoption of stiffening strategies leads to inadequate acquisition of the sensory information necessary to plan and execute dynamic and interactive movements. We conclude with some suggestions for future research.

The culture of falls and fear of falling: a phenomenological study

Trujillo LG, Painter JA, Berry CR.

*J. Womens Health Care* 2014; 3(5): e1000178.

(Copyright © 2014, OMICS Group)

**Abstract**

PURPOSE: This phenomenological study explored and described the lived experiences of community-dwelling older adults regarding what falls and fear of falling meant to them, and how each entity influenced self-efficacy, functional performance, and degree of engagement in occupations.
METHODS: Thirty-one older adults, 58 to 94 years old, were interviewed one time at a senior center or continual care retirement community. All interviews were analyzed using QSR NUD*IST 6 software.

RESULTS: Three main themes emerged: 1) highly fearful, and having their lives affected by the fear of falling; 2) having fallen, but rationalized their fears and modified their lives accordingly; and, 3) felt they had not fallen by their definition and remained active in place.

CONCLUSION: Findings suggest the importance for practitioners to listen and understand their clients’ stories and perceptions of how they are selectively engaging in life’s activities while maintaining a personal perception of living an active life style.

Risk Assessment

Comparison and characterization of Android-based fall detection systems

Luque R, Casilari E, Morón MJ, Redondo G.

Sensors (Basel) 2014; 14: 18543-18574.

Affiliation: Universidad de Málaga, Departamento de Tecnología Electrónica, ETSI Telecomunicación, 29071 Málaga, Spain. 061049251X@alu.uma.es.

Abstract

Falls are a foremost source of injuries and hospitalization for seniors. The adoption of automatic fall detection mechanisms can noticeably reduce the response time of the medical staff or caregivers when a fall takes place. Smartphones are being increasingly proposed as wearable, cost-effective and not-intrusive systems for fall detection. The exploitation of smartphones’ potential (and in particular, the Android Operating System) can benefit from the wide implantation, the growing computational capabilities and the diversity of communication interfaces and embedded sensors of these personal devices. After revising the state-of-the-art on this matter, this study develops an experimental testbed to assess the performance of different fall detection algorithms that ground their decisions on the analysis of the inertial data registered by the accelerometer of the smartphone.

RESULTS obtained in a real testbed with diverse individuals indicate that the accuracy of the accelerometry-based techniques to identify the falls depends strongly on the fall pattern. The performed tests also show the difficulty to set detection acceleration thresholds that allow achieving a good trade-off between false negatives (falls that remain unnoticed) and false positives (conventional movements that are erroneously classified as falls). In any case, the study of the evolution of the battery drain reveals that the extra power consumption introduced by the Android monitoring applications cannot be neglected when evaluating the autonomy and even the viability of fall detection systems.

Use of information technology for falls detection and prevention in the elderly

Atoyebi OA, Stewart A, Sampson J.


Abstract

This research aims to clarify the arguments in the body of knowledge on IT use in fall prevention among the elderly, synthesize ideas to assist in the delivery of healthcare to prevent falls in older people and further add to the available body of knowledge. An extensive literature search was carried out and the information retrieved from the literature was synthesised into paragraphs using themes to structure the types of information technology used for falls prevention. The different modalities of IT used in falls prevention at the different places of care for each category were explored and inferences were drawn from the structured themes which summarized the major findings. The research found that there is potential ground for a wider use of the forms of IT used in falls prevention in the elderly in various settings and outlined the factors involved in this usage. With further refinements in larger studies, many of these forms of IT would be better explored and acceptance is likely guaranteed provided they are accessible and affordable. The need for IT use in fall prevention in the elderly is unavoidable with the trend in technology and the associated convenience. More work is needed to further define...
the effects of IT in falls prevention using larger prospective studies that will be more generalizable.

Medication use and fall-risk assessment for falls in an acute care hospital


Affiliation: Institute of Injury Prevention and Control, College of Public Health and Nutrition, Taipei Medical University, Taipei, Taiwan; Department of Chest, Cathay General Hospital, Taipei, Taiwan.

(Copyright © 2014, Japan Geriatrics Society, Publisher John Wiley and Sons)

Abstract

AIM: A nested case-control study was carried out to examine relationships of a fall-risk score and the use of single medications and polypharmacy with falls among hospitalized patients aged 50 years and older in Taiwan.

METHODS: There were 83 patients who experienced a fall during hospitalization in an acute-care hospital. Matched by age and sex, five control patients for each case were randomly selected from all other inpatients who had not experienced any fall at the time of the index fall.

RESULTS: Patients who took tricyclic antidepressants, diuretics, and narcotics were 3.36-, 1.83- and 2.09-fold, respectively, more likely to experience a fall than their counterparts. Conversely, patients who took beta-blockers were 0.34-fold more likely than those who did not take them to experience a fall. Patients taking ≥6 medications were 3.08-fold more likely than those taking fewer medications to experience a fall, whereas those with anxiety were 4.72-fold more likely to experience a fall than those without. A high fall-risk score was not significantly associated with the occurrence of falls.

CONCLUSIONS: Among older hospitalized patients, tricyclic antidepressants, diuretics, narcotics, and polypharmacy should be mindfully prescribed and reviewed on a regular basis. A fall-risk scale developed from community-dwelling older people might not accurately predict falls in hospitalized patients. Further research to validate the negative effect of beta-blocker use on falls is required.

The predictive value of gait speed and maximum step length for falling in community-dwelling older persons

Bongers KT, Schoon Y, Graauwmans MJ, Schers HJ, Melis RJ, Olde Rikkert MG.


Affiliation: Department of Geriatric Medicine, Radboud University Medical Center, Nijmegen, The Netherlands.

(Copyright © 2014, Oxford University Press)

Abstract

BACKGROUND: falling is a major health problem.

OBJECTIVE: to investigate the predictive value for falls of the maximum step length and gait speed.

DESIGN: a prospective cohort study.

SETTING: geriatric outpatient clinic.

SUBJECTS: three hundred and fifty-two community-dwelling older persons screened by their general practitioner.

METHODS: maximum step length and gait speed were recorded as part of a comprehensive geriatric assessment. One-year follow-up was performed using the fall telephone system.

RESULTS: one hundred and thirty-six (39%) of all subjects (mean age: 76.2 years, standard deviation: 4.3, 55% female), fell at least once, of whom 96 were injured. Predictive values for any falls of both maximum step length and gait speed were low (area under the curve (AUC): 0.53 and 0.50) and slightly better for recurrent falls (maximum step length AUC: 0.64 and gait speed AUC: 0.59). After adding age, gender and fall history to the prediction model, the AUC was 0.63 for maximum step length and 0.64 for gait speed, and for recurrent falls, the AUC was 0.69 both for maximum step length and gait speed. The prediction of fall-related injuries showed similar results. A higher maximum step length score indicated a lower likelihood for falls (hazards ratio 0.36; 95% confidence interval 0.17-0.78).
CONCLUSIONS: maximum step length and gait speed as single-item tools do not have sufficient power to predict future falls in community-dwelling older persons.

Risk Factors

Depressive symptoms increase fall risk in older people, independent of antidepressant use, and reduced executive and physical functioning


Abstract
Depressive symptoms and antidepressant use are associated with greater fall risk in older people. This prospective study investigated interactions between depressive symptoms, antidepressant use and physical and cognitive function measures in relation to injurious or multiple falls in a large sample of community-living older people. Four-hundred and eighty-eight community-dwelling older people aged 70 years and over, underwent a comprehensive psychological, cognitive and physiological assessment and were prospectively monitored for falls over a 12-month follow up period. Substantial depressive symptoms were defined by a Geriatric Depression Scale (GDS) (15-item) score ≥5 and fallers were defined as people who had at least one injurious or two non-injurious falls during follow-up. In univariate analyses, the presence of depressive symptoms (RR=1.50; 95% CI=1.06-2.11), antidepressant use (RR=1.56; 95% CI=1.08-2.27), high physiological fall risk (RR=1.61; 95% CI=1.20-2.15) and poorer executive functioning (RR=1.40; 95% CI=1.05-1.88) were significant risk factors for falls. Multivariate models revealed that depressive symptomatology and antidepressant use were independent of each other, and independent of the presence of a high physiological fall risk and poorer executive functioning in the prediction of falls. Fall risk increased with the number of risk factors present: i.e. by 55% in participants with any two risk factors (RR=1.55; 95% CI=1.17-2.04) and by 144% in participants with three or four risk factors (RR=2.44; 95% CI=1.75-3.43). The study findings indicate that higher depressive symptoms and antidepressant use predict falls over 12-months, independent of reduced executive and physical functioning. Treatment of depressive symptoms using non-pharmacological approaches should be considered as part of fall prevention programs, especially in populations at high risk of falls.

Incidence of intracranial hemorrhage and outcomes after ground-level falls in geriatric trauma patients taking preinjury anticoagulants and antiplatelet agents

Reddy S, Sharma R, Grotts J, Ferrigno L, Kaminiski S.

Abstract
Antiplaletel and anticoagulant medication increases the risk of intracranial hemorrhage (ICH) after a fall in geriatric patients. We sought to determine whether there were differences in ICH rates and outcomes based on type of anticoagulant or antiplatelet agent after a ground-level fall (GLF). Our institutional trauma registry was used to identify patients 65 years old or older after a GLF while taking warfarin, clopidogrel, or aspirin over a 2-year period. Rates and types of ICH and patient outcomes were evaluated. Of 562 patients who met inclusion and exclusion criteria, 218 (38.8%) were on warfarin, 95 (16.9%) were on clopidogrel, and 249 (44.3%) were on aspirin. Overall ICH frequency was 15 per cent with no difference in ICH rate, type of ICH, need for craniotomy, mortality, or intensive care unit or hospital length of stay between groups. Patients with ICH were more likely to present with abnormal Glasgow Coma Score, history of hypertension, and/or loss of consciousness.
Abstracts Continued
Recent abstracts from the research literature

Injury patterns, severity and outcomes among older adults who sustained brain injury following a same level fall: a retrospective analysis
Scheetz LJ.

(Copyright © 2014, Elsevier Publishing)

Abstract

INTRODUCTION: The objectives of this study were to: identify the incidence and types of brain injuries; classify brain injury severity; identify additional injuries; and identify predictors of length of stay, mortality and trauma center admission.

METHODS: This secondary analysis used the NY State Inpatient Databases Healthcare Cost and Utilization Project. Inclusion criteria were: age 65 years and older, admitted to a hospital following a same level fall, primary hospital discharge diagnosis of traumatic brain injury. Descriptive and regression analyses were performed.

RESULTS: 3331 patient records were analyzed. Intracranial hemorrhage accounted for 70% of the brain injuries. Younger age, higher household income, insurance status, ethnicity, patient location, increasing number of chronic diseases and diagnoses predicted trauma center admission. Age, trauma center admission, comorbidities, and brain injury severity predicted mortality. Age, race, major surgery, and number of diagnoses predicted length of stay.

DISCUSSION: Brain injuries are common sequelae from falls among older adults. Additional research is needed to understand sociodemographic factors that are associated with trauma center admission.

Risk factors for frequent falls in people with Parkinson’s disease


Affiliation: Faculty of Health Sciences, The University of Sydney, Lidcombe NSW, Australia.
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Abstract

Fall frequency varies among individuals with Parkinson’s disease (PD). We aimed to determine whether risk factors that distinguish PD fallers from non-fallers are influenced by frequent falls. 205 people with PD participated in a 6-month prospective study. Factors in previously published fall risk models were analyzed for their associations with fall rates and frequent fallers. Fall history, freezing and impaired reactive balance were associated with fall rates and the proportion of frequent fallers (p < 0.05). These models were highly accurate in discriminating frequent fallers (area under curve 0.84-0.87). Interventions to manage freezing and reduce balance impairment may reduce fall frequency.

Recurrent falls in elder patients: risk factors and effect on care giving family members
Abdelrahman HMM, Elawam AEE.

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Abstract

BACKGROUND: Care giving produces great amounts of caregiver burden and stress. Falls are a common and complex geriatric syndrome that cause considerable mortality, morbidity, reduced functioning, and premature nursing home admissions.

AIM: To evaluate the risk factors of recurrent falls and effect on care giving family members.

MATERIALS AND METHODS: Case control study, performed with structured questionnaire conducted in an outpatient geriatric unit on 150 elder patients, divided into 2 groups; first: cases (100 subjects), second: controls (50 subjects). Comprehensive geriatric assessment and Timed Up and Go test (TUG) were applied.
Caregiver burden and potential determinants were measured in all participant partners using Caregiver Burden Questionnaire.

RESULTS: The mean age of the cases was 69.6 ± 6.8, while for controls was 67.2 ± 4.7, [P: 0.02]. Sex did not show a significant difference between cases and controls [P: 0.123]. The mean BMI of the cases was 26.03 ± 6.4, and of controls: 29.1 ± 6.8, [P: 0.007]. The functional state assessed by ADL showed significant difference between cases and controls, [P: <0.001]. Also the use of assistive device was more among cases than controls, [P: 0.01]. Depression and polypharmacy were significantly found in cases more than controls, [P: 0.006, 0.01 respectively]. The mean value of TUG test in cases was 23.9 sec ± 11.1 while for controls was 19.6 ± 11.3, [P: 0.02], and the number of subjects with impaired TUG test was significantly higher in cases than controls [P: 0.002]. Table 3 showed that caregiver stress was significantly prevalent and more severe in cases (84%) than controls (54%), [P: <0.001, 0.002 respectively], also the mean value of ZBI test in cases was 31.9 sec ± 22.8 while for controls was 18.5 ± 21.4, [P: 0.001]. Table 4 displayed possible determinants of severity of caregiver stress in cases. It was found that presence of depression and functional impairment in the cases group were significant determinants of caregiver stress [P: 0.006, 0.003] respectively, also the number of falls significantly determined the severity of caregiver stress; the more the number of falls, the more severe caregiver stress score [P: <0.001].

CONCLUSION: Age, lower BMI, functional impairment, polypharmacy, depression and use of assistive device are risk factors for recurrent falls in older adults, and the caregiver stress is more prevalent in those with recurrent falls especially with increase in the number of falls, the presence of depression and functional impairment. So we recommend assessment of these risk factors for falls in all older patients and also assessment of caregiver stress especially in the elders with recurrent falls. Key words: recurrent falls, elderly patients, care giving family members.

Association between use of multiple psychoactive medicines and hospitalization for falls: retrospective analysis of a large healthcare claim database

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Abstract

BACKGROUND: Little is known about the impact of taking multiple psychoactive medicines on the risk of hospitalization for falls.

OBJECTIVE: To identify the association between multiple psychoactive medicine use and hospitalization for falls.

METHODS: A retrospective cohort study was conducted between July 2011 and June 2012 in the Australian veteran population who had been dispensed at least one psychoactive medicine within the previous year. Psychoactive medicines with sedative properties included antipsychotics, anxiolytics, hypnotics, antidepressants, opioids, anti-epileptics, anti-Parkinson medicines and medicines for migraine. The associations between falls and the number of psychoactive medicines used or the number of doses were analysed in comparison with falls that occurred when no psychoactive medicine was used.

RESULTS: The adjusted results showed a significantly increased risk of falls when patients were on one or more psychoactive medicines or were receiving 0.1-0.9 defined daily dose (DDD) or more per day. The incident rate ratios (IRRs) were 1.22 (95% confidence interval [CI] 1.08-1.38) for those on one psychoactive medicine, 1.70 (95% CI 1.45-1.99) for those on two, 1.96 (95% CI 1.58-2.43) for those on three or four, and 3.15 (95% CI 1.90-5.23) for those on five or more. A similar result was observed when the data were analysed by dose, with the highest risk being found for those taking three or more DDD per day (adjusted IRR 4.26, 95% CI 2.75-6.58).

CONCLUSION: Increased numbers or increased doses of psychoactive medicines are associated with an increased risk of hospitalization for falls in older adults. Strategies to reduce the psychoactive medicine burden are likely to translate into significant health benefits.
Abstracts Continued
Recent abstracts from the research literature

Polypharmacy including falls risk-increasing medications and subsequent falls in community-dwelling middle-aged and older adults
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(Copyright © 2014, Oxford University Press)
DOI 10.1093/ageing/afu141 PMID 25313240
Abstract
BACKGROUND: polypharmacy is an important risk factor for falls, but recent studies suggest only when including medications associated with increasing the risk of falls.

DESIGN: a prospective, population-based cohort study. SUBJECTS: 6,666 adults aged ≥50 years from The Irish Longitudinal study on Ageing.

METHODS: participants reported regular medication use at baseline. Any subsequent falls, any injurious falls and the number of falls were reported 2 years later. The association between polypharmacy (>4 medications) or fall risk-increasing medications and subsequent falls or injurious falls was assessed using modified Poisson regression. The association with the number of falls was assessed using negative binomial regression.

RESULTS: during follow-up, 231 falls per 1,000 person-years were reported. Polypharmacy including antidepressants was associated with a greater risk of any fall (adjusted relative risk (aRR) 1.28, 95% CI 1.06-1.54), of injurious falls (aRR 1.51, 95% CI 1.10-2.07) and a greater number of falls (adjusted incident rate ratio (aIRR) 1.60, 95% CI 1.19-2.15), but antidepressant use without polypharmacy and polypharmacy without antidepressants were not. The use of benzodiazepines was associated with injurious falls when coupled with polypharmacy (aRR 1.40, 95% CI 1.04-1.87), but was associated with a greater number of falls (aIRR 1.32, 95% CI 1.05-1.65), independent of polypharmacy. Other medications assessed, including antihypertensives, diuretics and antipsychotics, were not associated with outcomes.

CONCLUSION: in middle-aged and older adults, polypharmacy, including antidepressant or benzodiazepine use, was associated with injurious falls and a greater number of falls.

Obesity and falls in older people: mediating effects of disease, sedentary behavior, mood, pain and medication use
Mitchell RJ, Lord SR, Harvey LA, Close JC.
Affiliation: Falls and Injury Prevention Group, Neuroscience Research Australia, University of New South Wales, Australia; Prince of Wales Clinical School, University of New South Wales, Australia.
(Copyright © 2014, Elsevier Publishing)
Abstract
Obesity has been associated with an increased risk of falls among older people. However, it is not certain whether factors commonly associated with falls and/or obesity mediate this risk. This research examines whether specific diseases, sedentary behavior, mood, pain, and medication use mediate the association between obesity and falls. A representative sample of community-living individuals aged 65+ years in New South Wales (NSW), Australia were surveyed regarding their experience of falls, height, weight, lifestyle and general health within a 12 month period. Intervening variable effects were examined using Freedman and Schatzkin’s difference in coefficients tests and regression analyses were used to estimate relative risks. Obesity was associated with a 25% higher risk (95% confidence interval (CI) 1.11-1.41; p<0.0003) of having fallen in the previous 12 months compared to non-obese individuals. The strongest mediators of the association between obesity and falls were sleeping tablets (t=-5.452; p<0.0001), sitting for more than 8h per day on weekdays (t=5.178; p<0.0001), heart disease/angina (t=3.526; p<0.0001), anti-depressant use (t=3.102; p=0.002), moderate/extreme anxiety or depression (t=3.038;
p=0.002), and diabetes (t=3.032; p=0.002). Sedentary behavior, chronic health conditions and medication use were identified as mediators for the association between obesity and falls in community living older people. Interventions aimed at weight reduction and increased activity may have benefits not only for fall prevention, but also for the mediating health, mood and lifestyle factors identified here.

**Interventions**

A randomized trial to measure the impact of a community-based cognitive training intervention on balance and gait in cognitively intact black older adults

Smith-Ray RL, Makowski-Woidan B, Hughes SL.


**Abstract**

INTRODUCTION: Fall prevention is important for maintaining mobility and independence into old age. Approaches for reducing falls include exercise, tai chi, and home modifications; however, causes of falling are multifactorial and include not just physical but cognitive factors. Cognitive decline occurs with age, but older adults with the greatest declines in executive function experience more falls. The purpose of this study was twofold: to demonstrate the feasibility of a community-based cognitive training program for cognitively intact Black older adults and to analyze its impact on gait and balance in this population.
METHOD: This pilot study used a pretest/posttest randomized trial design with assignment to an intervention or control group. Participants assigned to the intervention completed a computer-based cognitive training class that met 2 days a week for 60 min over 10 weeks. Classes were held at senior/community centers. Primary outcomes included balance as measured by the Berg Balance Scale (BBS), 10-meter gait speed, and 10-meter gait speed under visuospatial dual-task condition. All measures were assessed at baseline and immediately post-intervention.

RESULTS: Participants were community-dwelling Black adults with a mean age of 72.5 and history of falls (N = 45). Compared to controls, intervention participants experienced statistically significant improvements in BBS and gait speed. Mean performance on distracted gait speed also improved more for intervention participants compared to controls.

CONCLUSION: Findings from this pilot randomized trial demonstrate the feasibility of a community-based cognitive training intervention. They provide initial evidence that cognitive training may be an efficacious approach toward improving balance and gait in older adults known to have a history of falls.

Effects of short-term training of community-dwelling elderly with modular interactive tiles
Lund HH, Jessen JD.
Affiliation: Center for Playware, Department of Electrical Engineering, Technical University of Denmark, Kongens Lyngby, Denmark.

Abstract
OBJECTIVE: The objective of this study is to test for the increased mobility, agility, balancing, and general fitness of community-dwelling elderly individuals as a result of short-term training involving playing with modular interactive tiles (Entertainment Robotics, Odense, Denmark) at two community activity centers for the elderly. Three different tests from the Senior Fitness Test were used in order to test a variety of health parameters of the community-dwelling elderly, including those parameters related to fall prevention.

MATERIALS AND METHODS: Eighteen community-dwelling elderly individuals (63-95 years of age; mean, 83.2 years of age) were assessed in one intervention group without the use of a control group. The intervention group performed nine group sessions (1-1.5 hours each) of playful training with the modular interactive tiles over a 12-week period in two community activity centers for the elderly. Data were collected using pre-tests and post-tests of the 6-Minute Walk Test (6MWT), the 8-foot Timed Up & Go Test (TUG), and the Chair-Stand Test (CS). Data were analyzed for statistically significant differences and increases of means.

RESULTS: The 6MWT, TUG, and CS measurements showed statistically significant differences and increases of means between the pre-tests and post-tests with the 6MWT (P<0.001) (means difference, 22.4 percent), TUG (P<0.001) (means difference, 15 percent), and CS (P<0.002) (means difference, 14 percent). Fifty-six percent of the elderly progressed from one health risk level to a better level, according to the three tests.

CONCLUSIONS: Statistically significant increases in scores were found across all tests, suggesting an improvement of many different health parameters for the elderly. Well-established research has shown the relationship between such test scores and fall incidents, balancing, mobility, agility, etc. This significant improvement in the health status of the elderly is obtained in as few as nine training sessions over a 12-week period of “playing” exergames with the modular interactive tiles.

Effects of vertical and side-alternating vibration training on fall risk factors and bone turnover in older people at risk of falls
Affiliation: Healthcare for Older People, Nottingham University Hospitals NHS Trust, Hucknall Road, Nottingham NG5 1PB, UK.

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Abstracts Continued

Recent abstracts from the research literature

Abstract
BACKGROUND: whole-body vibration training may improve neuromuscular function, falls risk and bone density, but previous studies have had conflicting findings.

OBJECTIVE: this study aimed to evaluate the influence of vertical vibration (VV) and side-alternating vibration (SV) on musculoskeletal health in older people at risk of falls.

DESIGN: single-blind, randomised, controlled trial comparing vibration training to sham vibration (Sham) in addition to usual care. PARTICIPANTS: participants were 61 older people (37 women and 24 men), aged 80.2 ± 6.5 years, referred to an outpatient falls prevention service.

METHODS: participants were randomly assigned to VV, SV or Sham in addition to the usual falls prevention programme. Participants were requested to attend three vibration sessions per week for 12 weeks, with sessions increasing to six, 1 min bouts of vibration. Falls risk factors and neuromuscular tests were assessed, and blood samples collected for determination of bone turnover, at baseline and following the intervention.

RESULTS: chair stand time, timed-up-and-go time, fear of falling, NEADL index and postural sway with eyes open improved in the Sham group. There were significantly greater gains in leg power in the VV than in the Sham group and in bone formation in SV and VV compared with the Sham group. Conversely, body sway improved less in the VV than in the Sham group. Changes in falls risk factors did not differ between the groups.

CONCLUSIONS: whole-body vibration increased leg power and bone formation, but it did not provide any additional benefits to balance or fall risk factors beyond a falls prevention programme in older people at risk of falls.

Interprofessional education with a community fall prevention event
Affiliation: School of Pharmacy .
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Abstract
Implementation of interprofessional education (IPE) among multiple professional degree programs has many challenges. Students from four health science programs: pharmacy; nursing; physician assistant studies and physical therapy participated in an interprofessional community fall prevention event. This paper briefly describes the development of this IPE opportunity and the assessment of changes on students’ attitudes about IPE after participation in the event. Differing views on teamwork and professional roles are reported by professions. Positive attitudes towards interprofessional teamwork were observed after participation in the event. Based on these data, it appears that an interprofessional community service event offers a useful approach forward for incorporating IPE into the curricula of different health care programs.

The development of a community-based, pharmacist-provided falls prevention MTM intervention for older adults: relationship building, methods, and rationale
Mott DA, Martin B, Breslow R, Michaels B, Kirchner J, Mahoney J, Margolis A.
Inov. Pharm. 2014; 5: 140.
Affiliation: University of Wisconsin-Madison, School of Pharmacy.
(Copyright © 2014, University of Minnesota Department of Pharmaceutical Care)

Abstract
The objectives of this article are to discuss the process of community engagement experienced to plan and implement a pilot study of a pharmacist-provided MTM intervention focused on reducing the use of medications associated with falling, and to present the research methods that emerged from the community engagement process to evaluate the feasibility, acceptance, and preliminary impact of the intervention. Key lessons learned from the community engagement process also are presented and discussed. The relationship building and planning process took twelve months. The RE-AIM framework broadly guided the planning process since an overarching goal for the community
Recent abstracts from the research literature

Beneficial effects of vitamin D on falls and fractures: is cognition rather than bone or muscle behind these benefits?
Marcelli C, Chavoix C, Dargent-Molina P.

Abstract
The beneficial effect of vitamin D on bone tissue has long been attributed mainly to its positive effect on the intestinal absorption of calcium and on bone mineralization, which increases the bone mineral density (BMD) and thus decreases the risk of fracture. Recently, numerous extra osseous effects of vitamin D have been described, amongst them a positive effect on neuromuscular and cognitive functions. Several lines of evidence suggest that the beneficial effects of vitamin D on fall and fracture risk can be explained more by its action on the neuromuscular and cognitive functions than by its direct effect on bone metabolism. In this review, we first report on the relationships between vitamin D and osteoporotic fracture risk. Then, we present the data from the literature regarding the effects of vitamin D on risk factors such as fall risk and reduction in BMD, physical performance, and cognitive performance. Specific emphasis is put on the latter because there is evidence of a relationship between low concentration of serum 25-hydroxyvitamin D (the primary indicator of vitamin D status) and low cognitive abilities which have been shown to be a risk factor for falling. It can be further suggested that high risk of fracture in cognitively impaired adults could be explained by lower protective reaction when falling, which would result, for instance, from a lack of planning and foresight of the fall. Future studies are nonetheless needed to elucidate the associations between vitamin D and different risk factors, in particular the link between vitamin D and various cognitive functions.

Effect of different types of exercise on postural balance in elderly women: A randomized controlled trial
De Oliveira MR, da Silva RA, Dascal JB, Teixeira DC.

Abstract
Different types of exercise are indicated for the elderly to prevent functional capacity limitations due to aging and reduce the risk of falls. This study aimed to evaluate the effect of three different exercises (mini-trampoline, MT; aquatic gymnastics, AG and general floor gymnastics, GG) on postural balance in elderly women. Seventy-four physically independent elderly women, mean age 69±4 years, were randomly assigned to three intervention groups: (1) MT (n=23), (2) AG (n=28), and (3) GG (n=23). Each group performed physical training, including
Abstracts Continued

Recent abstracts from the research literature

cardiorespiratory, muscular strength and endurance, flexibility and sensory-motor exercises for 12 weeks. To determine the effects on each intervention group, five postural balance tasks were performed on a force platform (BIOMEC 400): the two-legged stand with eyes open (TLEO) and two-legged stand with eyes closed (TLEC); the semi-tandem stand with eyes open (STEO) and semi-tandem stand with eyes closed (STEC) and the one-legged stand. Three trials were performed for each task (with 30s of rest between them) and the mean was used to compute balance parameters such as center of pressure (COP) sway movements. All modalities investigated such as the MT, AG and GG were significantly (P<0.05) efficient in improving the postural balance of elderly women after 12 weeks of training. These results provide further evidence concerning exercise and balance for promoting health in elderly women.

Home modifications to reduce injuries from falls in the Home Injury Prevention Intervention (HIPI) study: a cluster-randomised controlled trial

Keall MD, Pierse N, Howden-Chapman P, Cunningham C, Cunningham M, Guria J, Baker MG.


Affiliation: Otago University, Wellington, New Zealand.

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Abstract

BACKGROUND: Despite the considerable injury burden attributable to falls at home among the general population, few effective safety interventions have been identified. We tested the safety benefits of home modifications, including handrails for outside steps and internal stairs, grab rails for bathrooms, outside lighting, edging for outside steps, and slip-resistant surfacing for outside areas such as decks and porches.

METHODS: We did a single-blind, cluster-randomised controlled trial of households from the Taranaki region of New Zealand. To be eligible, participants had to live in an owner-occupied dwelling constructed before 1980 and at least one member of every household had to be in receipt of state benefits or subsidies. We randomly assigned households by electronic coin toss to either immediate home modifications (treatment group) or a 3-year wait before modifications (control group). Household members in the treatment group could not be masked to their assigned status because modifications were made to their homes. The primary outcome was the rate of falls at home per person per year that needed medical treatment, which we derived from administrative data for insurance claims. Coders who were unaware of the random allocation analysed text descriptions of injuries and coded injuries as all falls and injuries most likely to be affected by the home modifications tested. To account for clustering at the household level, we analysed all injuries from falls at home per person-year with a negative binomial generalised linear model with generalised estimating equations. Analysis was by intention to treat. This trial is registered with the Australian New Zealand Clinical Trials Registry, number ACTRN12609000779279.

FINDINGS: Of 842 households recruited, 436 (n=950 individual occupants) were randomly assigned to the treatment group and 406 (n=898 occupants) were allocated to the control group. After a median observation period of 1148 days (IQR 1085-1263), the crude rate of fall injuries per person per year was 0.061 in the treatment group and 0.072 in the control group (relative rate 0.86, 95% CI 0.66-1.12). The crude rate of injuries specific to the intervention per person per year was 0.018 in the treatment group and 0.028 in the control group (0.66, 0.43-1.00). A 26% reduction in the rate of injuries caused by falls at home per year exposed to the intervention was estimated in people allocated to the treatment group compared with those assigned to the control group, after adjustment for age, previous falls, sex, and ethnic origin (relative rate 0.74, 95% CI 0.58-0.94). Injuries specific to the home-modification intervention were cut by 39% per year exposed (0.61, 0.41-0.91).

INTERPRETATION: Our findings suggest that low-cost home modifications and repairs can be a means to reduce injury in the general population. Further research is needed to identify the effectiveness of particular modifications from the package tested. FUNDING: Health Research Council of New Zealand.

These abstracts have been sourced from SafetyLit.org

SafetyLit provides abstracts of peer reviewed articles from researchers who work in the more than 30 distinct professional disciplines relevant to preventing and researching unintentional injuries, violence, and self-harm. Each week citations and summaries of about 400 articles and reports are included in a pdf document or through an RSS subscription.
Joining the Network
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If you have any problems, contact Esther Vance at e.vance@neura.edu.au.

Share your news and information/ideas
Do you have any news on Falls Prevention you want to share with others on the network, or do you want to report on a project that is happening in your area.

Please email Esther with your information. We also welcome suggestions for articles and information you would like to see in this newsletter.

Send your information to:

e.vance@neura.edu.au

The Network Listserv
It is great to see the increased activity on the listserv and we want to continue to promote this. To send an item to the listserv where all members of the network can see it, send an email to:

nsw-falls-network@lists.health.nsw.gov.au

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NSW Falls Prevention Network Background
The NSW Falls Prevention Network was established in 1993. The role of this network has grown since its inception and now includes:

• Meetings for discussion of falls related issues;
• Dissemination of research findings both local and international;
• Sharing resources developed and exploration of opportunities to combine resources in joint initiatives;
• Encouragement of collaborative projects and research;
• To act as a group to influence policy;
• To liaise with NSW Ministry of Health to provide information on current State/Commonwealth issues in relation to falls and
• Maintenance of resources pertinent to the field.

The main purpose of the network is to share knowledge, expertise and resources on falls prevention for older people.

The NSW Falls Prevention Network activities are part of the implementation of the NSW Falls Prevention Policy funded by the NSW Ministry of Health.

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