How effective are multi strategy approaches in falls prevention in reducing the number of falls with harm within a hospital/ in-patient setting

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Introduction

Falls are a major concern for hospitals and are among the most common unwanted event in older inpatients (von Renteln-Kruse et al 2007). Thirty-four percent of falls lead to injuries which have devastating effect on patients, family members and health care systems (Fischer et al 2005). They raise questions about the quality of care, consequences for patients and staff attitudes (Vassallo et al 2004).

This paper offers key findings from a master's dissertation critically appraising the literature concerned with a multidisciplinary team (MDT) approach in falls prevention among older adult inpatients using an evidence-based approach. The study explored whether multi strategy approaches in falls prevention can reduce the number of reported minor, moderate and major harms in line with the government initiative "Sign up to Safety" (NHS England 2014).

Background

A fall is described as a "sudden, unintentional, downward movement of the body to the ground or other lower surface" (Tzeng and Yin 2012 p 372). It is possible for anyone to experience this, the frequency increasing with age and frailty (WHO, 2007), with those aged over 65 at the highest risk (NICE, 2004). Falls are the main reason for the hospitalisation of the elderly (Hayes, 2004) and are often a consequence of encouraging patients to regain mobility post illness (Vassallo et al, 2002). Falls are expected to cost the National Health Service (NHS) 2.3 billion a year (NICE, 2013) and are the highest reportable patient safety incidence in general hospitals (Haines et al, 2011). Repeat falls are common; a study carried out by the Department for Work and Pensions (2013), found that two thirds of patients who fell, will experience a second event within six months.

Oliver et al (2000) found that of falls in hospital, between 30% – 40% result in documented injury with over 1,000 fractures reported annually (NPSA, 2007). This potential for harm makes falls prevention an important patient safety challenge; a key role for all involved members of staff (Oliver et al, 2010).

Aims

To identify and evaluate falls prevention strategies which may be used by the MDT within an inpatient setting and have contributed in the reduction of falls, with or without harm. To make recommendations of implementing falls prevention strategies in clinical practice; and to highlight any gaps identified in the evidence which require further research.

Methodology

Literature Search

Using a PICOS method (Population, Intervention, Comparison, Outcome, Study Design), literature concerning the effectiveness of a multi-disciplinary approach in falls prevention within an inpatient setting were systematically searched and then refined to capture as many relevant papers as possible (table 1). The search was not limited to one type of study as this may have yielded a low relevance.

Table 1: Literature Search Strategy

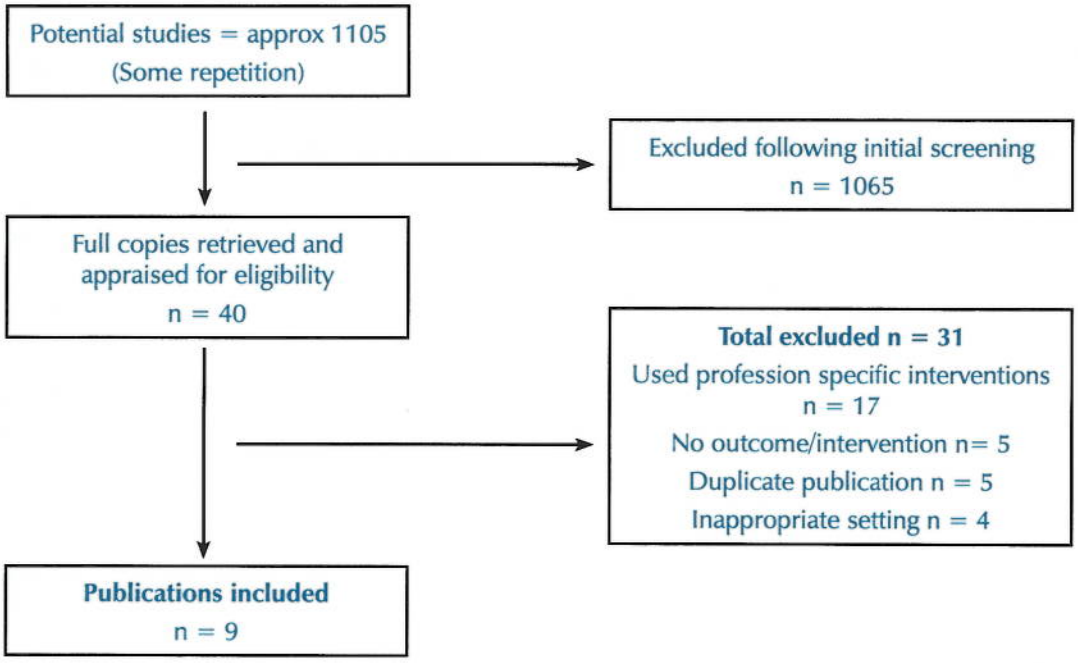
Search Strategy	Justification
Databases Searched: Medline, EMBASE, Cochrane Library, The Cumulative Index to Nursing and Allied Health Literature (CINAHL), American Psychological Information (PsycINFO) and the Allied and Complementary Medicine Database (AMED).	For reviews in healthcare interventions, Medline and EMBASE were used along with the Cochrane Library, as these are key resources in evidence based medicine. CINAHL, PsycINFO, AMED were also used as they are comprehensive and cover general and alternative healthcare, life sciences and profession specific evidence (Aveyard 2014). Using a wide range of databases ensured that all available evidence was identified.
Boolean Search Terms: *Population*: Old* person" or "Ageing person" or "Elderly" AND "Inpatient" or "Hospital Patient" *Intervention*: "Prevent*" "Toileting" or "Toilet" "Visual Prompt" or "Prompt" or "Alert" "Posters" or "Signs" or Signage or "Label" or "Stickers" "Handover or "Hand over" or "Hand-over" "Communicat* or Document* "Patient ward board" or "Ward board" or "information board" or "Patient board" or Patientboard or "Noticeboard" or "Notice board" "Supervise" or "Supervised" or "Supervision" or "Round* *Comparison*: no criteria *Outcome* "Fall risk" OR "Falls injury" "Falls rate" OR " Falls Frequency" *Study Design*: Not restricted	Lists of search terms were developed from the research question *"How effective are falls prevention strategies in reducing falls rates within a hospital/ inpatient setting"* and then refined, as simply using the terms, "older person "and "falls", would not have been specific or sensitive enough and would have yielded a large number of irrelevant papers. Searching for terms such as "falls prevention", "older person", "reduction in falls" and "hospital" may not have been comprehensive or relevant, so combinations of these were utilized in order to form a comprehensive search to yield better results.

The reference lists of the identified studies and those within national policies and guidelines were also reviewed to identify any further studies. Once the studies had been identified, they were screened using the title and abstracts to determine suitability. Abstracts from 40 research papers were reviewed. 31 papers were screened and excluded using the exclusion criteria (table 2). As a result, nine papers were deemed relevant after analysis (Figure 1).

Table 2: Inclusion and Exclusion Criteria

Inclusion Criteria	
Be published in English	The inclusion and exclusion criteria were chosen to: • Obtain the most recent evidence both nationally and internationally, and since the publication of the NICE guidelines in falls 2004. • Ensure literature was identified that would address the research question and demonstrate the scope of the literature available. The focus was multi strategy interventions that could be utilised by all members of the MDT (including administrators, housekeepers and other staff visiting the ward pharmacists, porters and families for example).
Be available in full to the author	
Have been published in the last 10 years (since 2005)	
Contain falls prevention strategies suitable for implementation and use by the full MDT	
Measure the effectiveness of prevention strategies in the older person, using rates as an outcome and rates of falls with or without injury.	
Be conducted within an inpatient setting	
Exclusion Criteria	
Profession specific interventions	
Studies conducted within other environments (dementia and psychiatric units for example)	

Figure 1: Flow chart of study selection process



Ethics

Formal ethical approval was not required to undertake this study.

Findings

Multi strategy approaches in the prevention of falls that could be utilised by the full MDT within an inpatient setting were the main focus of this study. Eight main themes emerged from the studies reviewed and could form the basis of any implementation strategy all with limited cost required.

Themes

1. **Accurate risk assessment** is important in the execution of individual interventions and care plans (Oliver et al, 2004). Without these, patient care needs will be compromised. However, even the best validated assessment tools will still fail to predict a significant number of falls and some older adults will remain at risk (Haines et al, 2010). Hence attention to identifying risk factors through assessment, reassessment and prevention from the time of admission is paramount in recognising any possible causative factors.
2. **Staff and patient education** was an integral part of each study. Wexler et al (2011) and Lancaster et al (2007) identified education as a root cause of prevention. There was variation in delivery (self-study, leaflets, notice boards and education sessions) in each study making comparisons difficult. New clinical staff received training as part of their induction in Barker et al (2009) study and Von Renteln-Kruse et al (2007) gave all patients at risk of falls, information on preventative measures, as part of their education. A "one-size-fits-all" approach may be ineffective within the delivery of an education programme and planning is essential to ensure the learning styles and necessary knowledge base of registered and non-registered staff is met. The longer term effects of education also requires further exploration as Krauss et al (2008) study found education programmes to be effective only in the short term.
3. **Visual cues** (signs, coloured wristbands, socks for example) were implemented as a method of identifying risk in all of the studies reviewed and involved the full MDT. There were inconsistencies in the use of visual aids within the studies. Different signs and symbols can be confusing and interpreted differently and staff may become immune to them. None of the authors discussed how these identifiers were cascaded to team members and visitors to ensure clarity of their meaning.
4. **Daily communication** concerning high risk patients was central in each study during handover. Daily safety huddles were designed to

discuss a patient's diagnosis, condition and falls risk, along with a post fall huddle to identify root causes (Kraft 2013). The plan of care should be communicated to the full MDT including patients themselves and their families (Carroll et al 2010) encouraging an open and honest safety culture (Francis 2013). In a study by Wexler et al (2011), team members designed a board to display the number of shifts since the last fall. This was placed within the staff rooms instead of on the patient corridor. They allow patients and relatives to view the data and should be an essential part of all inpatient settings. Reasons for board positioning were not made obvious but can have a significant impact and hold staff to account (Kraft 2013).

5. **Equipment.** Two of the studies (Fonda et al, 2006; Lancaster et al, 2007) introduced high low beds. One study (Lancaster et al, 2007) was being run alongside an initiative for pressure ulcers, so beds with several other features including a built in alarm system to alert staff when patients got out of bed alone were implemented. Reductions in falls rates were noted after the beds were integrated but it isn't clear whether this was attributable to the beds themselves or the other interventions and so could form part of further investigation to determine their value.
6. **Toileting** has been explored in several studies and found to be a major cause of falls and should be a key priority in any multi strategy approach (Carroll et al, 2010; Tzeng, 2010). Barker et al (2009) used a toileting schedule within their study as did Krauss et al (2008) who found compliance an issue.
7. **Hourly rounding** and an increase in supervision as part of the multi strategy approach was implemented in some of the studies (Krauss et al, 2008; Barker et al, 2009) as unwitnessed and repeat falls were identified as a key issue (Ireland, 2010). Repeat falls have been found to contribute up to 60% of all falls (Fonda et al, 2006; Dykes, 2010) and so require further attention.
8. **Staff compliance** and adherence in falls prevention is paramount. Barker et al (2009) found staff compliance with assessment and subsequent interventions was over 70%. This success was attributed to several factors including the falls risk assessment being population sensitive. It could be completed in a timely manner by one member of the team and was not reliant on other health professionals causing delays in identifying risk and the implementation of interventions. Fonda et al (2006) found similar results in the completion of the Falls Risk Assessment Scoring System (FRASS) showing an increase from 42% to 70% after two years with 60% of staff indicating a change in work practices to prevent falls. In other multi strategy methods, Dykes et al (2010) found less than desirable results in the use of visual aids, with only 89% adherence in placing the bed poster above the patient's head.

Discussion

The studies included in this review implemented similar strategies, albeit with some variation. They increased awareness of falls within diverse staff groups (Krauss et al, 2008), did not cause harm or increase risk, and incurred little, if any, cost. It is however, difficult to establish if any one intervention is superior, thus being beyond the remit of this study. Due to the heterogeneity of the identified studies, comparisons were difficult and methodological flaws were observed.

Some of the studies did not use baseline measurements making it difficult to distinguish the significance of the results (Lancaster et al, 2007; Wexler et al, 2011). Data collection and analysis varied within each study. The use of the electronic reporting system was used as a method of data collection in some studies (Krauss et al, 2008; Barker et al, 2009; Ireland, 2010) which is reliant on staff reporting in the first instance and with some degree of accuracy which can lead to anomalies. Data collectors were not always blinded to the falls status of the patient (Krauss et al, 2008), which may be a potential source of bias and data analysis was sometimes vague (Fonda et al, 2006).

Within some of the studies it was unclear which wards were used (medical, surgical, geriatric wards for example), how many patients were included and the skill mix of staff. This may influence success rates as different wards cater for different care needs. For example, elderly wards with varying degrees of mental health and medical status, all pose different challenges with varying levels of need and risk which must be accounted for. Some of the studies took place within single heath care systems, casting doubt as to whether results can be generalised (Dykes et al, 2010).

Using working groups and leaders to drive initiatives forwards has been deemed vital in some studies (Lancaster et al, 2007; Ireland, 2010; Wexler et al, 2011), along with the evaluation of the practical impact of the change. This can be undertaken by using different measurements regarding rates and injury. The data may also be triangulated (Cresswell, 2003), by measuring the number of

related complaints, safer staffing levels and patient satisfaction feedback.

There is a need for empirical studies to focus on the effectiveness of interventions in the inpatient setting over a longer period of time, to clearly define which if any, prove effective in reducing the number of older adult inpatient falls and those experiencing repeated falls (Stern and Jayasekara, 2009). For studies using multi strategy interventions, more research is needed to determine if any one stands out, to demonstrate their relative efficacies, (Stern and Jayasekara, 2009) and whether they are maintained by staff over an extended period.

Falls prevention requires staff motivation and momentum in order to embed these innovative strategies into working cultures. Other initiatives need to be persued to confront this safety concern, so prevention and reduction of falls rates will, by default, improve the patient experience, quality of life and engender a multifaceted approach in the overall care of the elderly.

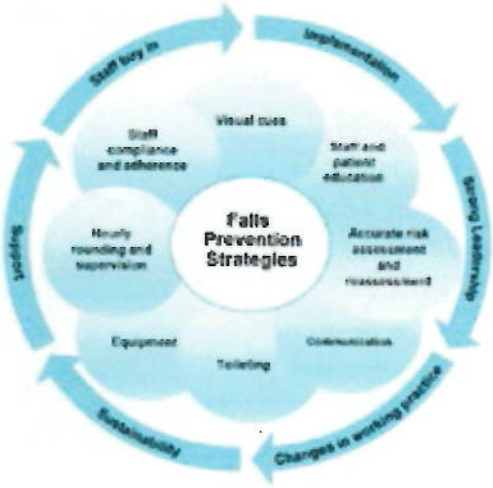


Figure 2: A Conceptual Framework to demonstrate the key factors and concepts required for a multi-strategy approach to in-patient falls prevention

Conclusion

Inpatient falls remain a significant problem (Carroll et al, 2010) and a main focus in patient safety and a measure of quality (DiBardino et al, 2012). A simplified standardised approach, buy in from staff combined with strong leadership and support are critical components to the success of any prevention programme (Krauss et al, 2008). The implementation of a multi strategy approach requires complex modification to working practices with changes in staff mind-sets to aid in compliance (Fig. 2). Preventing and reducing falls is a key organisational priority and the proposed implementation of strategies from this study into clinical practice, is the first step in trying to ensure success.

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References

Barker A, Kamar J, Morton A et al (2009). Bridging the Gap between Research and Practice: Review of a Targeted Hospital Inpatient Fall Prevention Programme. Qual Saf Health Care 18: 467-72.

Carroll DL, Dykes PC and Hurley AC (2010). Patients' Perspectives of Falling While in an Acute Care Setting and Suggestions for Prevention. Applied Nursing Research 23: 238-241.

Creswell JW (2003). Research Design: Qualitative, Quantitative and Mixed Methods Approaches. Second Edition. SAGE Publications.

Department for Work and Pensions (2013). Falls In Older People. [ONLINE] Available at: http://www.dwp.gov.uk/publications/specialist-guides/medical-conditions/a-z-of-medical-conditions/falls/. [Accessed 05 January 2014].

DiBardino D, Cohen ER and Didwania A (2012). Meta-analysis: Multidisciplinary Falls Prevention Strategies in the Acute Care Inpatient Population. Journal of Hospital Medicine 7(6): 497-503.

Dykes PC, Carroll DL, Hurley AC et al (2010). Fall Prevention in Acute Care Hospitals. Journal of the American Medical Association 304(17): 1912-1918.

Fischer ID, Karuss MJ, Dunagan WC et al (2005). Patterns and Predictors of Inpatient Falls and Fall Related injuries in a Large Academic Hospital. Infection Control and Hospital Epidemiology 26: 822-827.

Fonda D, Cook J, Sandler V et al (2006). Sustained Reduction in Serious Falls Related Injuries in Older People in Hospital. The Medical Journal of Australia Vol 184 (8): 379-382.

Francis R (2013). The Mid Staffordshire NHS Foundation Trust. Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry. [ONLINE] Available at: http://www.midstaffspublicinquiry.com/sites/default/files/report/Executive%20summary.pdf. [Accessed 06 January 2014].

Haines TP, Bell RA and Varghese PN (2010). Pragmatic, Cluster Randomized Trial of a Policy to Introduce Low-Low Beds to Hospital Wards for the Prevention of Falls and Fall Injuries. Journal of American Geriatric Society 58: 435-41.

Haines TP, Hill AM, Hill KD et al (2011). Patient Education to Prevent Falls Among Older Hospital Inpatients: A Randomized Controlled Trail. Arch Intern Med 171(6): 516-24.

Hayes N (2004). Prevention of Falls among Older Patients in the Hospital Environment. British Journal of Nursing 13: 896-901.

Ireland S (2010). Designing a Falls Prevention Strategy That Works. Journal of Nursing Care Quality 25(3): 198-207.

Kraft T (2013). Hospital Achieves 50% Reduction in Falls with Huddles, Better Rounding. Healthcare Risk Management 5: 54-55.

Krauss MJ, Tutlam N, Costantinou E et al (2008). Intervention to Prevent Falls on the Medical Service in a Teaching Hospital. Infection Control and Hospital Epidemiology 29(6): 539-545.

Lancaster AD, Ayers A, Belbot B et al (2007). Preventing Falls and Eliminating Injury at Ascension Health. The Joint Commissioning Journal on Quality and Patient Safety 33(7): 367-75.

National Institute Of Excellence (NICE) (2004). Falls: Assessment and Prevention of Falls in Older People. CG161 [ONLINE] Available at: http://publications.nice.org.uk/falls-assessment-and-prevention-of-falls-in-older-people-cg161. [Accessed 06 January 2014].

National Institute Of Excellence (2013). Falls: Assessment and Prevention of Falls in Older People. CG161. [ONLINE] Available at: http://publications.nice.org.uk/falls-assessment-and-prevention-of-falls-in-older-people-cg161/recommendations#preventing-falls-in-older-people-during-a-hospital-stay-2. [Accessed 12 January 2014].

National Patient Safety Agency. 2007. The Third Report from the Patient Safety Observatory. [ONLINE] Available at: http://www.nrls.npsa.nhs.uk/EasySiteWeb/getresource.axd?AssetID=61390&. [Accessed 10 August 2016].

NHS England (2014). Sign up to Safety [ONLINE] Available at: http://www.england.nhs.uk/signuptosafety/. [Accessed 26 November 2014]

Oliver D, Hopper A and Seed P (2000). Do Hospital Fall Prevention Programs Work? A Systematic Review. Journal of the American Geriatrics Society: Vol 48 (12) 1679-1689.

Oliver D, Daly F, Martin FC, Marion E and McMurdo T (2004). Risk Factors and Risk Assessment Tools for Falls in Hospitals Inpatients: A Systematic Review. Age and Ageing. Vol 33: 122-30.

Oliver D, Healey F and Haines T (2010). Preventing Falls and Falls Related Injuries In Hospitals. Clinical Geriatric Medicine 26: 645-92.

Stern C and Jayasekara R (2009). Interventions to Reduce the Incidence of Falls in Older Adult Patients in Acute Care Hospitals; A Systematic Review. International Journal of Evidence Based Healthcare 7: 243-249.

Tzeng HM (2010). Understanding the Prevalence of Inpatient Falls Associated With Toileting in Adult Acute Care Settings. J Nurs Care Qual 25: 22-30.

Tzeng HM and Yi Yin C (2012). Toileting Related Inpatient Falls In Adult Acute Care Settings. Med Surg Nursing 21(6): 372-77.

Vassallo M, Sharma JC and Allen SC (2002). Characteristics of Single Fallers and Recurrent Fallers among Hospital in Patients. Gerontology Vol 48 (3): 147-50.

Vassallo M, Vignaraja R, Sharma J et al (2004). The Effect of Changing Practice on Falls Prevention in a Rehabilitative Hospital: The Hospital Prevention Study. Journal of American Geriatric Society 52: 335-39.

von Renteln-Kruse W, Krause T and Geogr D (2007). Incidence of In-Hospital Falls in Geriatric Patients Before and After the Introduction of an Interdisciplinary Team-Based Fall Prevention Intervention. Journal of the American Geriatrics Society 55: 2068-2074.

Wexler S, O'Neill C, Foster N et al (2011). The Ruby Red Slipper Programme: An Interdisciplinary Falls Management Programme in a Community Academic Centre. Med Surg Nursing 20(3): 129-133.

World Health Organisation (WHO) (2007). WHO Global Report on Falls Prevention in Older Age. Available at: http://www.who.int/ageing/publications/Falls_prevention7March.pdf (Accessed: 10 August 2016).