Piloting staff education in Australia to reduce falls in older hospital patients experiencing delirium

Running title: Patients and delirium: Minimizing falls

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No conflict of interest has been declared by the authors.

TITLE

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ABSTRACT

This study piloted a delirium and falls, hospital-based education program to investigate impacts upon the staff's knowledge and practice plus patients' falls. On a medical ward, staff knowledge was compared before and after education. Other data - collected one day before, and one after, program implementation - addressed documentation of patients' delirium plus evidence of staff compliance with falls risk minimization protocols. These data, and numbers of patients' falls, were compared before and after program implementation. Almost all ward staff members were included in education sessions (7 doctors, 7 allied health, and 45 nurses) and knowledge significantly improved for the 22 completing surveys both before and after session attendance. Patients assessed as having delirium (5 before implementation, 4 afterwards) were all documented as either confused or delirious. Small changes eventuated in adherence with falls risk management protocols for confused patients and falls decreased. The program merits a stronger emphasis on staff activities relating the detection, documentation, and management of delirium to inter-professional roles and communication. Evidence of practice enhancement from program implementation should precede rigorous testing of impacts upon falls.

KEY WORDS

Accidental falls, delirium, hospitals, education

INTRODUCTION

Falls in hospital are adverse events impacted upon by the hospital's patient safety culture (Black *et al.*, 2011). The staff's learning, teamwork, and communication are key components of this culture (Pinkerton, 2005). Hospital patients experiencing cognitive impairment are particularly vulnerable to falls (Australian Commission on Safety and Quality in Health Care, 2014). Delirium is a primary cause of cognitive impairment, characterized by fluctuating consciousness, attention, thinking, and perception (O'Malley *et al.*, 2008). Delirium and old age are both risk factors for falls, with delirium particularly common in older hospital patients (Tropea *et al.*, 2008).

Literature review

Delirium is often undetected in older hospital patients (Oliver, 2010; Tropea *et al.*, 2008). Written reports of adverse events have demonstrated limited staff understandings of both cognitive impairment and related needs for risk management (Watkin *et al.*, 2012). Lakatos et al.'s (2009) audit of patients' records detected an association between falls and delirium (recognized and unrecognized).

Three studies, in particular, have addressed concerns about delirium in hospitals. In the United Kingdom, education for nurses and doctors (together) led to reduced delirium prevalence and increased delirium detection (Tabet *et al.*, 2005). In Australia, an inter-professional collaboration that drove ward team compliance with best practice recommendations resulted in improved prevention and management of post-operative delirium in older patients (Sykes, 2012). A (US) program that included volunteers plus inter-disciplinary education to help reduce delirium (Inouye *et al.*, 2006) also led to falls reduction (Babine *et al.*, 2013).

Other relevant research is specific to nurses. Orthopedic nurses' limited understanding of delirium was improved with education (Meako *et al.*, 2011). Tzeng and Yin (2013) found that addressing cognitive status was one of the most helpful aspects of falls prevention nursing education. Gordon et al. (2013) trialed bedside

coaching for nurses in conjunction with didactic education, finding subsequent improvements in documentation of delirium screening. Rice et al. (2011) determined that nurses' under-detection of delirium was substantial, even when a validated tool was used, and Flagg et al. (2010) found that hypoactive delirium was most frequently missed by nurses.

Finally, when Lang et al. (2008) included medical students in delirium and falls education, knowledge gains were applied during patient assessments. However, during post-education testing, these students made inappropriate choices related to medications, restraint, and the use of urinary catheters.

In summary, the potential exists for a two-fold benefit from improved hospital staff understandings of delirium and its relationship to falls risk. First, there is some evidence that falls can be reduced when delirium is prevented. Second, falls should be minimized when delirium is well-recognized and appropriate risk reduction strategies are promptly implemented.

Further studies are now required to investigate the extent to which delirium and falls education for the inter-professional ward team can improve delirium detection and reduce falls via improved risk management. To address this issue, the work reported here drew upon the theory related to practice change *plus* recognized benefits from inter-professional education to provide a novel approach. In particular, the intended outcome from the education was to provide a common understanding across disciplines that would inform inter-professional practice.

Study aim and research questions

The aim of this study, conducted in 2013, was to conduct a preliminary trial of an education program designed to address the hospital staff's practice in detecting and documenting delirium and then implementing existing falls risk management protocols. Research questions were:

1. Does implementing the program improve knowledge of delirium and of how delirium relates to falls?

2. Does implementation also improve practice with regard to:

   (a) the staff's detection and documentation of delirium?

   (b) the staff's implementation of existing falls risk management protocols?

3. Are there indications that a reduction in falls results?

Education program

Two considerations underpinned the education program (Figure 1), which was designed for the ward-based team. First, the *Theoretical Domains Framework* that informs the *Behavior Change Wheel* (BCW) (Cane *et al.*, 2012) illustrates a need to move beyond education alone when attempting practice change. The BCW indicates that behavior can be changed by addressing capability, opportunity, and motivation (Cane *et al.*, 2012). For this reason, the new program included components addressing opportunity and motivation in addition to an education session (addressing capability). Second, Inter-Professional Education (IPE) – defined as "where the members of more than one health or social care profession, or both, learn interactively together, for the explicit purpose of improving inter-professional collaboration or the health/well-being of patients/clients, or both" (Reeves *et al.*, 2013) has resulted in changes in both team behaviors and improved patient outcomes when combined with inter-professional activities or procedures (Sockalingam *et al.*, 2014).

[Please insert Figure 1 about here].

In recognition of these potential benefits from IPE, the program developed for this study delivered joint sessions for the nursing and allied health staff. The doctors attended a separate session with a greater emphasis on diagnosis and treatment of underlying conditions. It was intended that every clinical professional staff member on the ward would attend a session.

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The learning objectives and expected learning outcomes were common to all sessions. Objectives were to promote a common understanding across disciplines of delirium in older hospital patients, its impact upon falls risk, and implications for inter-professional practice. Expected learning outcomes were that participants would be able to:

- recognize signs of delirium in older patients and
- respond to these signs, within the context of their professional roles, with particular reference to addressing falls risk minimization.

Education sessions lasting 30 minutes were held for small groups, which, for nursing and allied health staff, involved the presentation of multiple (repeated) sessions at close proximity to the ward so that the nurses, in particular, could attend emergencies within the ward area if required. Day time sessions were held in the afternoon, when staffing levels were higher. Night nurses were included by adjusting the rostered hours of the day staff, increasing the staff 'overlap'. Doctors were educated away from the ward area and the session was integrated into a pre-planned study session. Only junior doctors were included as consultants and registrars worked across multiple wards.

The emphasis in all sessions was on case studies to illustrate key points plus facilitated discussions that addressed the recognition of the staff's roles. For doctors, there was an emphasis on implementing treatments for conditions that might be causing the delirium and reviewing existing treatments with the potential to exacerbate falls risk. For the nursing and allied health staff, there was an emphasis on observing for signs of delirium and ensuring that these were acted upon in terms of team communication and the implementation of designated falls risk management strategies.

METHODS

Design

A quasi-experimental, pre-test post-test, design was used. Impacts upon staff knowledge and practice from the education program were evaluated; as were any indications of an impact upon patients' falls.

Participants and setting

All junior doctors, allied health practitioners (AHPs), and nursing staff members working on the 30-bed general medical ward during the study were invited to participate in surveys. All patients aged 65 years and older present on the ward on two designated audit days, one before the intervention and one afterwards, were eligible for study inclusion unless they were unconscious or could not speak or understand English.

Instruments

Demographic details were collected from the staff, and Hare et al.'s (2008) Knowledge of Delirium Questionnaire (KDQ) was augmented with four items addressing knowledge of the relationship between falls and delirium and of actions recommended to reduce falls risk in delirium within the study setting. In the KDQ, one item requires participants to respond to true/false definitions of delirium and another asks them to identify tools that might help to identify delirium. Remaining items comprise statements to which participants are asked to respond 'agree', 'disagree' or 'unsure', recoded to 'correct', 'incorrect', and 'unsure'. There are 14 general statements about the presentation and management of delirium and 14 addressing delirium risk. Face validity of the KDQ has been confirmed by experts and, when administered to nurses in all areas of an Australian public hospital (n=338), significantly higher 'correct' scores were found in the only included ward that was using specific strategies for the care of patients experiencing delirium (Hare et al., 2008).

The Confusion Assessment Method (CAM) (Inouye et al., 1990) was used to identify delirium in older patients. This validated tool is widely used to screen for delirium (Inouye et al., 2014). We also developed, piloted, and refined an audit tool to ascertain the staff's documentation of delirium in older patients plus compliance with required documentation and falls risk minimization strategies for confused or delirious patients according to hospital guidelines.

Data collection related to knowledge

At Time 1 (T1, within the month prior to the intervention), staff members were invited to complete the initial knowledge questionnaire and a demographic details form, delivered to the ward in a named envelope, and deposit responses into a sealed box. Immediately after the education session, at Time 2 (T2), they were asked to complete the knowledge questionnaire again, depositing it into the box at the session venue. Surveys were identified by codes that allowed us to match responses across data collection time points.

Data collection related to practice

Two audit days were designated, one day before the intervention and one afterwards. Geriatric medicine trainees and occupational therapists were trained to detect delirium using the CAM (Inouye et al., 1990) by the geriatrician and occupational therapist on our study team. The rationale for this group conducting the assessments is that these two disciplines are responsible for CAM assessments within the study setting. On the audit days, eligible older patients were assessed using the CAM by this team at three time points each day (morning, afternoon, and early evening). The assessments were overseen by the two instructing investigators to ensure their validity. The ward staff's documentation of delirium for the included patients was also assessed on these days, as was documentation indicating staff compliance with falls risk management strategies for this patient group.

Data collection related to falls

Using data from routine reports, numbers of falls of older patients in the month before and the month after the education program, and from the corresponding month in previous years, were tabulated.

Ethical considerations

Ethical approval for the study was obtained from the Human Research Ethics Committees (HRECS) of Curtin University and the participating hospital. Staff members

provided written informed consent to interview participation and patients were included via a waiver of consent approved by the HRECs based upon Australian ethical guidelines (National Health and Medical Research Council, 2007). Staff survey completion signified consent.

Data analysis

Version 21 of the IBM SPSS statistical software package (IBM Corp., Armonk, NY, USA) was used for quantitative analyses (alpha $\leq$0.05). Descriptive statistics summarized staff characteristics and knowledge survey responses. Correct responses for T1 and T2 were compared for the staff responding at both time points using Wilcoxon signed rank tests. The extent to which patients, identified by assessors as having delirium, were documented as confused or experiencing delirium by the ward staff, was compared from before to after program implementation. Data indicating the implementation of falls risk management protocols were compared using the percentage of responses indicating compliance with requirements at each time point. Numbers of falls in older patients were compared before and after program implementation and between the corresponding months in previous years; then changes for each year were compared. Given the small numbers included in this pilot study, testing for statistical significance was not undertaken when comparing audit data or numbers of falls.

RESULTS

Knowledge change

All except two eligible staff members (nurses) attended the education sessions (59/61; 7 doctors, 7 AHPs, 45 nurses). At T1, 28 staff members completed surveys, 50 at T2. Most staff participants were aged 30 years or younger and had been in their position for less than five years (Table 1). Twenty four staff members completed questionnaires at both time points <u>and</u> attended the education session; these cases were included in comparisons of T1 and T2 findings. However, two nurses failed to complete the full

questionnaire either at T1 or T2, resulting in missed responses for more than 50% of the risk, presentation/management, and added items. Therefore just 22 cases were included in most statistical comparisons.

[Please insert Table 1 about here]

Two participants provided incorrect responses to the item addressing definition of delirium at T1; one at T2. The Mini Mental State Examination (Folstein et al., 1975), Delirium Rating Scale (Hodkinson, 1972) and CAM (Inouye et al., 1990) were recognized as useful when screening for delirium by 26%, 87%, and 44% of participants respectively at T1; 54%, 96%, and 46% at T2 (n=24).

Median numbers of correct responses improved across nurses, AHPs, and doctors who responded at both time points (Table 1) and there were significant improvements after the education in knowledge of risk factors (17 positive changes, 2 ties, 3 negative changes; z=3.384, p≤0.001) and delirium presentation/management (17 positive changes, 1 tie, 4 negative changes; z=3.302, p≤0.001) for the 22 included participants (Table 2). For this group, there were also improvements in numbers of correct responses to all added (falls related) items, ranging from 9% to 27%.

[Please insert Table 2 about here].

Practice change

From the 23 older patients assessed for delirium at each time point, five (22%) were determined to have delirium on the assessment day before the education program, four (17%) afterwards. All these patients were also documented (by the ward staff) as having delirium or being confused within the 24 hours before the assessment, plus three more of these older patients on the first occasion, four at the second (total n=8 each time). The falls risk management strategies evaluated at each time point for these 16 patients are included in Table 3. No completed cognitive assessment forms were found in the first audit; after the education there were four (50%).

[Please insert Table 3 about here]

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Falls comparisons

Falls decreased from nine in March 2013 (immediately before the education program) to three in May. In previous years, a rise had occurred instead (Table 4).

[Please insert Table 4 about here]

DISCUSSION

Falls in hospital settings lead to considerable distress, injury, and increased costs to the health care system (Oliver, 2010). This pilot work evaluated impacts from a hospital-based education program addressing delirium and falls with respect to knowledge, practice, and what may be regarded as a practice outcome in this context – numbers of falls sustained. Findings are considered with respect to each research question and with reference to:

 (a) the BCW (Cane et al., 2012), which articulates the need to address capability, opportunity, and motivation when implementing practice change;

(b) the existing evidence base regarding IPE and practice enhancement that also informed program development; and

(c) research findings documented in the literature review section of this paper.

Knowledge

The education sessions addressed staff knowledge and decision making as a key facet of the staff's capability (Cane *et al.*, 2012). As in previous work, for example Lang et al.'s (2008) study of delirium and falls education for medical students, the need for education was supported by pre-implementation findings demonstrating knowledge deficits and knowledge was improved by attendance at the education sessions.

A limitation of our study was that only a relatively small group of attendees completed questionnaires before and after session attendance, with substantial staff attrition attributable to inter-ward moves. Including whole sections of a hospital in a future study would help address the issue of staff mobility. Face-to-face administration of the questionnaires before the education, as well as immediately afterwards, would

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improve both the response rate and the validity of findings (given that knowledge was being assessed). Follow-up assessment, for example after a further month or two, is essential in future work to establish knowledge sustainability.

Practice

Practice evaluated in this study included delirium identification and documentation plus implementation of falls risk management strategies. Tabet et al.'s (2005) study found that improved delirium detection resulted when nurses and doctors were educated together, which was not achieved in the current study. Priority content areas for physicians were determined to be different to those for other professional groups, meaning that sessions for this group were run separately to avoid an unnecessarily long time commitment and, potentially, participant disengagement.

The opportunity to improve practice in this area was supported by provision of the resource folder and 'meet the expert' sessions. Motivation was supported by the use of reminders such as posters. In our findings, though, there were only small indications of practice change. Two previous studies that achieved practice change (Gordon *et al.*, 2013; Sykes, 2012) adopted different approaches – one included bedside coaching and another involved unit-based, inter-professional, collaborative decision making. In future work, the education program requires stronger elements of active participation in learning. In addition, engaging the staff in identifying the roles that each profession needs to play within the ward team has the potential to provide both opportunity and motivation to drive enhanced practice.

From a methodological perspective, accepting 'confused' as an alternative to 'delirious' when patients' notes were audited meant that the extent to which the staff was accurately identifying delirium *per se* remained unknown. One way in which staff confidence in accurately identifying delirium might have been addressed would have been to include instruction in the use of the CAM during the education sessions. In this study, however, our goal was to promote the more consistent use of existing protocols,

which included the completion by nurses of the Abbreviated Mental Test when confusion was noted plus a referral to the Occupational Therapist for possible further testing using the CAM.

Also, although the validity of delirium 'diagnoses' by our study team was enhanced by the supervision of CAM assessments by two investigators who were highly experienced in this process, inter-rater reliability estimates were not obtained during this pilot work. Addressing these study limitations is essential in subsequent work. Promoting staff commitment to delirium documentation as a critical component of patient safety may be one way to help address this issue. From a pragmatic perspective, detecting a confused patient should still result in implementing the same falls risk management protocols, regardless of the cause of the confusion, although the medical care would be different if delirium was considered likely.

Outcomes

The number of falls sustained by older patients was reduced during this study. However, a failure to demonstrate improved falls risk minimization practice means that attributing this decrease to the program cannot be supported. Based upon Sockalingam et al.'s (2104) review, the extent to which inter-professional activities are incorporated into IPE sessions influences the likelihood of benefits for patients from such education. Providing IPE was challenging in this study. The joint nurses-AHP sessions had to be brief, and held close to the ward, to avoid jeopardizing patient care. This meant that activities were limited to brief discussions and were frequently interrupted. Embedding meticulously planned IPE activities into program sessions may make a difference. Incorporating such sessions into routine, mandatory, hospital-wide, off-ward, sessions has even greater potential to address 'whole of team' engagement. The Australian Commission on Safety and Quality in Health Care (2014) has recently released guidelines to provide better care for people with cognitive impairment in hospital. These guidelines aim to ensure the detection of cognitive impairment,

including delirium, and recognize that falls are a possible consequence. Integration of these guidelines into existing National Safety and Quality standards means that hospitals will now need to provide dedicated education regarding care for people experiencing cognitive impairment.

CONCLUSION

This pilot study was intended to form the basis for future research to investigate the impact on falls of increasing the hospital staff's knowledge of delirium and its relationship to falls via an education program. Such pilot work is essential when addressing the complex area of health care practice change intended to benefit patients. Whereas increasing staff knowledge, and hence the staff's capability, is clearly achievable, the program needs to be further refined to adequately address practice change. In particular, the program needs to address the opportunities and motivation associated with enhanced practice in the inter-professional team via the inclusion of inter-professional activities. A strong emphasis on informed and complementary professional roles is also recommended.

Future trials of the refined program should be designed to investigate relationships between knowledge gains, practice change, and numbers of falls occurring; they should also ensure accurate measures of practice change as a priority. When audits are used, practice may not be reflected in the documentation. However, given the significance of documentation as a form of communication, the education program needs to include accurate documentation as a goal. This research topic is of international interest. Our findings and recommendations may help to inform others seeking to address falls risks in hospital patients experiencing delirium.

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REFERENCES

Australian Commission on Safety and Quality in Health Care (ACSQHC). A Better Way to Care: Safe and High-Quality Care for Patients with Cognitive Impairment (Dementia and Delirium) in Hospital. Sydney, New South Wales, Australia: ACSQHC, 2014. [Cited November 19, 2015]. Available from URL: http://www.safetyandquality.gov.au/

Babine RL, Farrington S, Wierman HR. HELP© prevent falls by preventing delirium. Nursing2013 2013; **May**: 18-21.

Black AA, Brauer SG, Bell RAR, Economidis AJ, Haines TP. Insights into the climate of safety towards the prevention of falls among hospital staff. J Clin Nurs 2011; **20**: 2924-2930.

Cane J, O'Connor D, Michie S. Validation of the theoretical domains framework for use in behaviour change and implementation research. Implement Sci 2012; **7** [Serial online]. [Cited November 19, 2015]. Available from URL: http://www.implementationscience.com/content/8/1/28. http://implementationscience.biomedcentral.com/articles/10.1186/1748-5908-7-37

Clinical Epidemiology & Health Services Evaluation Unit. Clinical Practice Guidelines for the Management of Delirium in Older People. Melbourne, Victoria, Australia: Australian Health Ministers' Advisory Council, 2006. [Cited November 19, 2015]. Available from URL: https://www2.health.vic.gov.au/getfile/?sc_itemid=%7bF688CA4D-38B8-414C-B353-1318CB5D904B%7d&title=Clinical%20Practice%20Guidelines%20for%20the%20Management%20of%20Delirium%20in%20Older%20People%20-%20October%202006

Flagg B, Cox L, McDowell S, Mwose J, Buelow J. Nursing identification of delirium. Clin Nurse Spec 2010; **24**: 260-266.

Folstein MF, Folstein SE, McHugh PR. "Mini-mental state". A practical method for grading the cognitive state of patients for the clinician. J Psychiatr Res 1975; **12**: 189-198.

Gordon S, Melillo K, Nannini A, Lakatos B. Bedside coaching to improve nurses' recognition of delirium. J Neurosci Nurs 2013; **45**: 288-293.

Hare M, Wynaden D, McGowan S, Landsborough I, Speed G. A questionnaire to determine nurses' knowledge of delirium and its risk factors. Contemp Nurse 2008a; **29**: 23-31.

Hodkinson HM. Evaluation of a mental test score for assessment of mental impairment in the elderly. Age Ageing 1972; **1**: 233-238.

Inouye S, vanDyck C, Alessi CA, Balkin S, Siegal AP, Horwitz, RI, Clarifying confusion: The Confusion Assessment Method. A new method for detecting delirium. Ann Intern Med 1990; **113**: 941-948.

Inouye SK, Baker DI, Fugal P, Bradley EH. Dissemination of the Hospital Elder Life Program: Implementation, adaptation, and successes. J Am Geriatr Soc 2006; **54**: 1492-1499.

Inouye SK, Kosar CM, Tommet D et al. The CAM-S: Development and validation of a new scoring system for delirium severity in 2 cohorts. Ann Intern Med 2014; **160**: 526.

Lakatos BE, Capasso V, Mitchell MT et al. Falls in the general hospital: Association with delirium, advanced age, and specific surgical procedures. Psychosomatics 2009; **50**: 218-226.

Lang V, Clark N, Medina-Walpole A, McCann R. Hazards of hospitalization: Hospitalists and geriatricians educating medical students about delirium and falls in geriatric inpatients. Gerontol Geriatr Educ 2008; **28**: 98-104.

Meako M, Thompson H, Cochrane B. Orthopaedic nurses' knowledge of delirium in older hospitalized patients. Orthopaedic Nursing 2011; **30**: 241-248.

National Health and Medical Research Council. National Statement on Ethical Conduct in Human Research. Canberra, Australian Capital Territory, Australia: Australian Government, 2015 [Cited November 19, 2015]. Available from URL: https://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72_national_statement_may_2015_150514_a.pdf

O'Malley G, Leonard M, Meagher D, O'Keeffe ST. The delirium experience: A review. J Psychosom Res 2008; **65**: 223-228.

Oliver A. Preventing falls and fall-related injuries in Hospitals. Clin Geriatr Med 2010; **26**: 645-692.

Pinkerton S. Patient safety culture. Health Care Manage Rev 2005; **30**: 1.

Reeves S, Perrier L, Goldman J, et al. Interprofessional education: Effects on professional practice and healthcare outcomes (update). Cochrane Database of Systematic Reviews 2013; Art. No: CD002213.

Rice K, Gomez M, Foreman M. Nurses' recognition of delirium in the hospitalized older adult. Clin Nurse Spec 2011; **11**: 299-311.

Sockalingam S, Tan A, Hawa R, Pollex H, Abbey S, Hodges BD. Interprofessional education for delirium care: A systematic review. J Interprof Care 2014; **28**: 345-351.

Sykes P. Prevention and management of postoperative delirium among older patients on an orthopedic surgical unit: A best practice implementation project. J Nurs Care Qual 2012; **27**: 146-153.

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Tabet N, Hudson S, Sweeney V, et al. An educational intervention can prevent delirium on acute medical wards. Age Ageing 2005; **34**: 152-156.

Tropea J, Slee J-A, Brand CA, Gray L, Snell T. Clinical practice guidelines for the management of delirium in older people in Australia. Australas J Ageing 2008; **27**: 150-156.

Watkin L, Blanchard MR, Tookman A, Sampson EL. Prospective cohort study of adverse events in older people admitted to the acute general hospital: Risk factors and the impact of dementia. Int J Geriatr Psychiatry 2012 **27**:76-82.

Component	Description
Education sessions	These sessions addressed the staff's <u>capability</u> via face-to-face 30-minute education sessions about delirium and the relationship between delirium and falls. Sessions included case studies and facilitated discussion recognizing staff roles. Each nurse and AHP attended a joint sessions run by a senior nurse that also addressed falls risk assessments and risk management strategies. Each of the junior doctors attended a session run by a geriatrician that also included issues relevant to prescribing and diagnosis of underlying conditions causing delirium.
Resource folder and 'meet the expert' sessions.	These two strategies addressed the staff's <u>opportunity</u> for further practice enhancement. The ward-based folder was a reference tool, containing: (i) the hospital's Nursing Practice Guidelines for the Management of the Older Patient with Acute Confusion (Delirium), (ii) a copy of national Clinical Practice Guidelines for the Management of Delirium in Older People (Clinical Epidemiology & Health Services Evaluation Unit, 2006), and (iii) the Falls Risk Management Tool (FRMT) that provided the basis for falls risk management in the hospital. 'Meet the expert' sessions were when experts from the investigating team visited the ward to discuss 'cases' or issues with the staff to provide clarification.
Color coding and reminders	These strategies primarily addressed <u>motivation</u>. Color coding was to remind the staff of the link between delirium and falls. Green was already associated with falls prevention; orange was the color of the delirium guideline booklet. Posters and orange pens provided motivating messages.

Figure 1. Components of the education program addressing capability, opportunity, and motivation

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Table 1

Staff characteristics and median scores for sub-groups responding at both times

	In position ≤1 year	In profession ≤5 years	Aged ≤30 years
T1: 4 doctors, 5 AHPs, 19 nurses	14 (50%)	19 (68%)	17 (61%)
T2: 3 doctors, 6 AHPs, 41 nurses	21 (42%)	34 (68%)	29(58%)
T1 & T2: 2 doctors, 5 AHPs, 17 nurses	11 (46%)	16 (67%)	15 (63%)
(15 nurses with complete responses)			

	Median score at T1		Median score at T2	
		Number correct from possible 14		
	Risk	Presentation	Risk	Presentation
Doctors	4	9.5	3	13
AHPs	4	9	11	14
Nurses	7	9	11	13

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Table 2

Changes in numbers of correctly answered knowledge of delirium questions

	Time 1		Time 2		Comparisons
	Median	Range	Median	Range	
Risk (14 items)	6.5	0-11	9	6-11	z = 3.38, p = 0.001
Presentation/management (14 items)	11	0-14	13	4-14	z = 3.30, p = 0.001

Note. N=22. Comparisons only included participants completing surveys at both time points.

Table 3

Findings from the audit for the eight patients documented as confused

	Time 1	Time 2
	n (%)	n (%)
Need for reorientation documented (notes)	2 (25)	4 (50)
Need for companion documented (notes)	1 (13)	2 (25)
Confusion noted (FRMT)	3 (38)	5 (63)
Need for falls prevention intervention indicated (FRMT)	5 (63)	6 (75)
Confusion/disorientation identified as risk factor (FRMT)	7 (88)	6 (75)
At least one intervention selected (FRMT, eg, low bed, alarm mat)	6 (75)	6 (75)
Need for supervision in toilet/shower (nursing care plan)	8 (100)	5 (63)
Observation strategies (nursing care plan)	2 (25)	3 (38)

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Table 4

Falls data for patients on the ward aged 65 years or older

Year	Number of falls in March	Number of falls in May
2011	6	8
2012	1	11
2013	9	3

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