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Education for delirium prevention: Knowing, meaning and doing

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ABSTRACT

Hospital-acquired delirium is a common complication for older patients. Delirium prevention programs have been shown to reduce incident delirium and decrease length of stay; however, incorporating delirium prevention into nursing practice continues to be challenging. A three-element delirium prevention educational program was conducted with 42 nurses in a medical ward in a tertiary hospital in southeast Queensland. The education program focused on knowing, meaning and doing, consisting of a brief online course, case discussions with experts, and a high-fidelity simulation. A repeated cross-sectional design was utilised, with data collected over four time points before (T0), during the education program (T1, T2) and three months post completion of the study (T3). There were high levels of participation in the elements (48%–85%). Correct responses on the knowledge survey increased over time from 74.5% (T0) to 86.4% (T3; $p = .003$), suggesting a program focused on knowing, meaning and doing, was effective in improving nurses' knowledge about delirium. The increase in knowledge post completion indicates that learning about delirium prevention continued without structured education. Further research into how knowledge might be shared between nurses as part of everyday work may reveal other practice-based learning techniques which support practice change.

1. Introduction

Delirium is a common complication for older people in hospital. It is often under-reported (Clegg et al., 2011), missed or mistaken for other conditions (Mittall et al., 2011) and associated with a higher risk of mortality (Yang et al., 2009), length of stay and rate of institutionalisation (Witlox et al., 2010). Delirium is defined as an acute decline in cognitive function, characterised by fluctuations in attention, awareness and cognition (Inouye et al., 2014) and is associated with increased mortality in non-surgical populations (Inouye et al., 2014; Travers et al., 2013). There is an increased risk of developing delirium whilst in hospital, particularly for older adults (Inouye et al., 2014), with the incidence of delirium estimated to be occur in 17–44% of hospitalised older adults, aged 50 years and over (Travers et al., 2013). Further, there is a body of robust evidence which suggests that up to 40% of cases of delirium in people aged 65 years and over can be prevented (Inouye et al., 2014) and delirium prevention programs can reduce length of stay (Rudolph et al., 2014). Given international projections that the number of older persons, aged 60 years and older, is expected to double by 2050 and triple by 2100 (United Nations, n.d.), and that over 40% of hospital separations are for adults aged 65 years and older, delirium prevention has become an important international health issue. Incorporating delirium prevention into clinical practice is emerging as an important clinical practice matter.

Evidence for delirium prevention has been incorporated into national guidelines in Australia ([Australian Commission for Safety and Quality in Health Care ACSQHC, 2016]), the United Kingdom (National Institute for Health and Care Excellence, 2010), and the United States (Sendelbach and Guthrie, 2009). However, direct patient care activities such as assessment, family/patient interaction, nutrition and mobility required in delirium prevention are not prioritised and sometime missed or left undone (Jones et al., 2015). There is also evidence to suggest that health care staff do not recognise the clinical presentation of delirium (El Hussein et al., 2014). Not incorporating delirium prevention activities in nursing practice has been attributed to a lack of knowledge about delirium and its clinical implications (Rice et al., 2011) and ageist attitudes (Teodorczuk et al., 2013). Educational programs that increase knowledge, address negative attitudes and thereby improve practice around delirium prevention are urgently required.

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1.1. Background

A systematic review suggests that multicomponent non-pharmacological interventions are the most effective means of preventing delirium in older hospitalised adults (Hshieh et al., 2015). As such, many researchers are exploring multifaceted education programs that address these multiple components (Gordon et al., 2013; Hickens et al., 2017; Page et al., 2010; Travers et al., 2018). Some of the challenges to implement such programs are associated with releasing staff (Bezzant, 2008), time constraints (Jones et al., 2015; Toye et al., 2017), and lack of perceived significance (Meyer et al. 2007). In general, there appear to be three categories of delirium prevention education, focused on knowing, meaning and doing outlined in the following paragraphs.

There is general agreement that ***knowing*** 'the facts' can support delirium prevention and care. For example, on-line programs appeared to have good uptake (Detoyer et al., 2016; McCrow et al., 2014; van de Steeg et al., 2014) and are recommended to address knowledge deficits (Irwing et al., 2009). In addition to on-line delivery, many of the available education programs include information provided in didactic lecture form (Devlin et al., 2008; Gesin et al., 2012; Gordon et al., 2013; Hickin et al., 2017; Meako et al., 2011; Page et al., 2010; Ramaswamy et al., 2010; Tabet et al., 2005; Toye et al., 2017; Wand et al., 2014).

Small group discussion is another common educational technique used in delirium prevention (Pizzacalla et al., 2015; Tabet et al., 2005; Toye et al., 2017; Travers et al., 2018; Wand et al., 2014). Through discussion with others, the ***meaning*** of experiences can be explored, and empirical knowledge can be integrated into personal and ethical knowledge, generating possible applications to practice (Bélanger and Duchame, 2015).

The third group of educational techniques focus on practice, either through coaching at the bedside (Gordon et al., 2013; Hickin et al., 2017; Travers et al., 2018) or simulation (Page et al., 2010; Paquette et al., 2010). These practice-based techniques appear to focus on the aesthetics, or ***doing***, of practice.

In reviewing the research, the educational justification for the different approaches in these programs is not consistently addressed. Most appear to conceptualise learning in the workplace as constructivist, where learners incorporate new knowledge into knowledge acquired from previous experiences (Joseph and Juwah, 2012; Peters, 2000) and current knowledge influences what new or modified knowledge will be constructed in future experience (Billett, 2001; Peters, 2000). However, practice is complex, involving time, spaces, bodies and things (Hopwood, 2014) and how to learn a new practice, such as delirium prevention, should consider these complexities. A three-tiered education program focused on ***knowing***, ***meaning*** and ***doing*** may address these complexities.

As part of a delirium prevention implementation project in one ward in one hospital in southeast Queensland, we adopted a multi-faceted program that included elements to address knowing, meaning and doing in order to understand how this approach might improve overall knowledge of delirium prevention and care. The education program was one component of a larger implementation plan for a Delirium Prevention and Care Intervention Bundle, which was consistent with the Australian Commission for Safety and Quality in Health Care Delirium Clinical Standard (ACSQHC, 2016). The aim of this paper is to investigate the impact of the three-element delirium prevention educational program on nurses' knowledge about delirium prevention and care over time.

2. Research design

A repeated cross-sectional survey design, with data collected over four time points before (T0), during the implementation of the education programme (T1, T2) and three months after completion of the study (T3), was undertaken to investigate team knowledge over time.

2.1. Setting & participants

The education program was conducted with nursing staff from one 24 bed general medical unit of an acute care hospital in southeast Queensland between May 2017 and October 2017. Registered Nurses, Enrolled Nurses and Assistants in Nursing were included.

2.2. Intervention

The three-element education program was offered throughout the six-month project. Nurses were encouraged to progress through the program as follows:

1. All nurses were expected to complete the on-line modules within the first two months of the intervention (May–June 2017);
2. Nurses on shift attended the discussions about practice, which were facilitated by a clinical expert, and held every two weeks from May to October 2017; and
3. Nurses who had completed the on-line module and participated in at least one discussion, attended a simulation session held monthly from June to October 2017.

On-line modules (knowing). The two on-line, self-directed, delirium prevention modules were selected on the information provided. These modules were developed by a research team from the University of Wollongong and are free and accessible at http://www.adhere.org.au/deliriumcare.html.

Discussion group (meaning). A Nurse Practitioner specialising in the care of older adults, as well as a variety of other experts (e.g., occupational therapist, geriatric psychiatrist), facilitated a discussion group held with nurses rostered on shift every two weeks. The discussions were responsive to the needs and/or concerns expressed by staff attending, usually focused on a specific case. These discussions were semi-structured and provided a social dialogue focused on sharing and testing ideas/concepts in the context of meaningful cases. Experts as facilitators was important given that clinicians report that people as information sources were considered most useful and most accessible in the clinical setting (Marshall et al., 2011). Topics are outlined in Table 1.

Simulation (doing). The 1-h simulation session was designed to depict a patient presenting with a possible delirium (see Fig. 1) and was offered once each month. Learning outcomes included: screening for delirium on admission, recognition of delirium, and inclusion of family in delirium care. Each simulation session included two simulation educators, one as the patient and one as the clinical facilitator/confederate, the unit clinical educator and/or researcher as the family member/neighbour, and two unit registered/enrolled nurses who volunteered to engage in the simulation scenario. Other ward staff in attendance observed the scenario. A debrief, with opportunity for questions and discussion, directly followed each simulation session.

As part of the maintenance phase, on completion of the study, from November 2017, new staff were invited to complete the on-line modules and the expert-facilitated Delirium Discussions continued to be held monthly. The simulation sessions were not continued.

2.3. Data collection

The Nursing Unit Manager distributed the Delirium Knowledge Questionnaire to all nurses working in the ward at four time points, April 2017 (T0), August 2017 (T1), October 2017 (T2), and February 2018 (T3). The questionnaire included 24 items drawn from Hare et al.'s (2008) Delirium Knowledge Questionnaire. These items were selected based on their importance and relevance to older adults (aged 65 years and older), as the whole intervention targeted this patient cohort. A geriatric psychiatrist (AT) on the team assisted with item selection.

Table 1
Attendance at each Education Component.

Domain (Available staff)	Description	Lead	Date	Attended (n)
Knowing	Complete online program (ADHERE): http://www.adhere.org.au/deliriumcare.html	Self-directed	May, June	35
Total n = 42				
Meaning	How to include and/or support the family/carer of older hospitalised patients.	Researcher	May	5
Total per shift n = 8	Explore nurse-led strategies to engage hospitalised older patients socially and cognitively.	Occupational Therapist	May	6
	Case studies of older patients at risk of delirium	Nurse Practitioner	May	4
	The legal and ethical implications of sharing information with family over the phone	Nursing Unit Manager	June	8
	How to get to know the person with dementia quickly – use of the Sunflower technique	Nurse Practitioner	June	5
	Distinguishing delirium, dementia and depression	Geriatric Psychiatrist	July	14
	Case studies of older patients at risk of delirium	Nurse Practitioner	July	4
	How to include and/or support the family/carer of older hospitalised patients.	Researcher	August	5
	How to incorporate screening into our daily work	Clinical Facilitator	August	6
	How to use the heuristic – PINCH ME	Clinical Facilitator	August	6
	Case studies of older patients at risk of delirium	Nurse Practitioner	September	8
	Case studies of older patients at risk of delirium	Nurse Practitioner	September	4
	Case studies of older patients at risk of delirium	Nurse Practitioner	October	4
	Explore nurse-led strategies to engage hospitalised older patients socially and cognitively.	Occupational Therapist	October	5
Doing	Simulation	Simulation Team	June	5
Total per shift n = 8			July	5
			August	4
			September	4
			December	4

The questionnaire took approximately 10 min to complete. Respondents were required to mark agree, disagree or unsure for each item. Items marked as unsure were scored as incorrect. Scores on the questionnaire ranged from 0 (low knowledge) to 24 (high knowledge). The face validity of the questionnaire has been established (Hare et al., 2008) and modified versions used in previous research in delirium education of nurses (e.g., Gordon et al., 2013; Toye et al., 2017).

Demographic information was collected with each survey and included age, gender, skill level, number of years of nursing experience and any additional training in the care of older people.

2.4. Ethical considerations

Participants were provided with information about the study and completion and return of the survey implied consent. Surveys were anonymous and collected in a sealed box held on the ward. Hard copies were held in a locked office and each one was scanned onto an e-database for storage in a password protected computer system. Ethical approval was obtained from both the [name hospital] (16QGC44) and [name university] (GU2016/360) Human Research Ethics Committees.

2.5. Data analysis

Quantitative data analyse was conducted using SPSS version 23. Descriptive and one-way analysis of variance analyses were performed.

3. Results

While the three-element approach was relatively straightforward to introduce and sustain over time, coordination work was required. This coordination relied on a highly-engaged Nursing Unit Manager and experienced Clinical Nurse Facilitator.

The three-element program was available to all staff working on the intervention ward. Table 1 shows the eligible number of participants in the program, noting that there were 42 in total who were eligible for the on-line programmes and up to 8 nurses could attend the discussion or simulation activities at any one time. While everyone was asked to complete the two online modules once, some nurses may have attended multiple discussion sessions. Nurses attended the simulations once only. Thirty-five nurses completed the on-line module (83% participation), 36 attended at least one discussion sessions (85% participation) and 20 completed one simulation session (48% participation). Eleven nurses completed only one element, 31 completed at least two of the elements and 15 completed all three elements of the education program.

Table 2 describes the number of participants and demographic data for those who completed the Delirium Knowledge Questionnaire at each time point. The demographics suggest a relatively young staff (x = 39.2 years), early in their careers (x = 6.9 years of experience), with limited training in geriatric care. For each survey, 50%–64% of nursing staff completed the survey. The frequency of correct responses for each question and overall total correct are shown in Table 3.

There was an overall significant improvement in knowledge (p = .001), specifically T0 to T2 (p = .03) and T0 to T3 (p = .003). As shown in Table 3, 92.6%–100% of participants responded correctly to

An elderly patient, Betty, who was transferred from orthopaedics for rehabilitation and pain control following a fall and right hip pain. The patient has multiple comorbidities including Parkinson's disease, Dementia and Osteoporosis. There was a documented history of constipation, confusion, pyrexia and dehydration. The patient demonstrated signs and symptoms of a Urinary Tract Infection (UTI) and possible delirium.

Fig. 1. Simulation case scenario.

Table 2
Description of Nurse Demographic Details.

	Total *n*	T_0 April 2017 25	T_1 August 2017 22	T_2 October 2017 20	T_3 February 2018 23	*p*
Age (years)						
M (SD)	39.2 (10.4)	37.28 (9.7)	36.64 (10.6)	39.7 (10.9)	42.2 (9.3)	.244
Current role (n)		RN (22) EN (3) AIN (1)	RN (20) EN (4) –	RN (15) EN (5) AIN (1)	RN (19) EN (3) –	.712
Years' experience						
M (SD)	6.9 (6.2)	5.8 (4.7)	6.8 (5.9)	8.7 (9.6)	6.7 (4.0)	.478
No Training in geriatric care (%)		73.1	72.0	61.9	66.7	.840

Note. Chi square analysis was conducted on categorical variables (current role; training in geriatric care) and one-way ANOVA for continuous variables (age; years' experience).

five questions (5, 7, 8, 13, 21) and this frequency was maintained across time. There was also consistent and sustained improvement for a subgroup of questions (2, 3, 4, 6, 10, 11, 17, 19, 20). However, there was a subgroup of questions, which remained sub-optimum, although there was evidence of improvement in the frequency of correct responses over time. The correct responses associated with comorbidities and the senses (14, 16, 22) as risks for delirium remained low. Question 24 relating to a family history of dementia was of particular difficulty, with only approximately 50% of respondents providing the correct response.

4. Discussion

The three-element program was developed with a focus on factual knowledge (knowing), practical understanding (meaning), and learning the 'how to' or aesthetics of delirium prevention and care (doing). Most nurses completed the online modules (knowing) within the first two months of the program. By T1, four months into the program, seven discussions and two simulations had been held and by T2, the six month point, a further seven discussions and three simulations were held.

The improvement in correct scores on the knowledge survey over time suggests that the knowledge gained through engagement in on-line learning, discussion, and high-fidelity simulation, may be attributed to the different ways that nurses' incorporated knowledge from these experiences into their personal constructions of knowledge. This improvement in knowledge is consistent with the previous research into education (e.g., Detoyer et al., 2016: Gesin et al., 2012; McCrow et al., 2014: Toye et al., 2017). However, only McCrow et al. (2014) showed sustained knowledge over time, consistent with this study. Like this study, the McCrow et al. (2014) and Toye et al. (2017) programmes combined knowing and meaning approaches through web-based modules and discussion groups. Other studies that used knowing strategies such as on-line learning modules (Detoyer et al., 2016) and slide presentation by a pharmacist (Gesin et al., 2012) found changes in the post-education period but did not monitor knowledge over time.

This rise over time and particularly the sustained level of knowledge following completion of the program suggests that the nurses in this ward may have developed a shared understanding in delirium prevention and care that carries potential for social transformation. While this study focused on the formal learning activities, more informal social learning may be occurring between nurses who work together every day. Drawing upon Lave and Wenger (1991), social transformation can emerge from the changing relations between the newcomers

Table 3
Responses to the questionnaire.

Delirium Questionnaire Questions (*adapted from* Hare et al., 2008)	Correct Response	Frequency Correct (%)			
	T/F	T0	T1	T2	T3
1. Fluctuation between orientation and disorientation is not typical of delirium.	F	70.4	79.2	85.7	65.2
2. Symptoms of depression may mimic delirium.	T	66.7	79.2	81	91.3
3. Treatment for delirium should include sedation.	F	81.5	87.5	85.7	95.7
4. Patients do not remember episodes of delirium.	F	22.2	50.0	61.9	73.9
5. Delirium never lasts for more than a few hours.	F	92.6	100	100	100
6. A patient who is lethargic and difficult to rouse does not have delirium.	F	77.8	91.7	95.2	91.3
7. Patients with delirium are always physically and/or verbally aggressive.	F	100	100	100	100
8. Delirium is generally caused by alcohol withdrawal.	F	96.3	100	100	100
9. Patients with delirium have a higher mortality rate.	T	74.1	87.5	90.5	87.0
10. Behavioural changes in the course of the day are typical with delirium.	T	77.8	83.3	57.1	87.0
11. A patient with delirium is likely to be easily distracted and/or have difficulty following a conversation.	T	88.9	87.5	95.2	82.6
12. Patients with delirium often experience perceptual disturbances.	T	88.9	95.8	100	91.3
13. Altered sleep/wake cycle may be a symptom of delirium.	T	100	95.8	100	100
14. A patient admitted for pneumonia and having diabetes, visual and auditory disturbances has the same risk for delirium as a patient admitted with pneumonia without comorbidities.	F	29.6	37.5	57.1	65.2
15. The risk of delirium increases with age.	T	88.9	95.8	100	91.3
16. A patient with impaired vision is at increased risk of delirium.	T	40.7	58.3	81.0	78.3
17. The greater the number of medications a patient is taking, the greater their risk of delirium.	T	88.9	91.7	76.2	100
18. A urinary catheter in situ reduces the risk of delirium.	F	88.9	87.5	76.2	82.6
19. Poor nutrition increases the risk of delirium.	T	85.7	95.8	95.2	95.7
20. Dementia is an important risk factor for delirium.	T	70.4	75.0	81.0	91.7
21. Dehydration can be a risk factor for delirium.	T	92.6	100	95.2	100
22. Hearing impairment increases the risk of delirium.	T	40.7	62.5	71.4	73.9
23. Avoid eye contact in the prevention of delirium because it can be seen as a threat.	F	70.4	91.7	90.5	73.9
24. A family history of dementia predisposes a patient to delirium.	F	55.6	45.8	42.9	56.5
Total Correct (%)	*M* (*SD*)	74.5 (11.7)	82.5 (11.0)	84.1 (8.8)	86.4 (11.1)
Total (*N* = 95)	*n*	27	24	21	23

Note. T0 pre-intervention; T1 mid-intervention; T2 post-intervention; T3 3-month follow-up.
T = True F = False.

and old timers in the context of changing a shared practice. In this case, relations between nurses who were engaging in educational activities (newcomers) and other nurses (old timers) were changing, with the potential of changing a shared practice, in this case the prevention of delirium in older patients. To fully understand how learning acquired through these three work-based pedagogical strategies can be translated into practice, research to explore how those nurses who engage in the educational programs relate to those who do not is required. The aim would be to understand if, and how, knowledge acquired through these programs is embedded into team practices.

In terms of specific areas of knowledge, nurses in this group appeared to have strong taken-for-granted beliefs about the risk factors for delirium that were not changed by these learning experiences. In light of these findings, we recommended targeted case discussions and possibly a simulation that can illustrate how limited vision and hearing, and the presence of co-morbidities, increases the risk of developing delirium.

4.1. Limitations

While a repeated cross-sectional survey design allowed us to follow changes in knowledge over time, there were some limitations to this approach. Firstly, without a comparison group, there is a risk that the improvements in knowledge may have been contributed to other factors at the organisational level. Secondly, while the groups of nurses who completed the surveys at each time point were from the same ward, the nature of nursing work rosters meant that all nurses were not consistently engaged in learning activities, and some nurses may have had more opportunities to attend the formal activities than others. Finally, in our quest to ensure anonymity, the questionnaires were not matched to participants at each time point. This means that the surveys may have been completed by the same or different nurses on the four occasions. However, we were able to gauge group understanding over time, and this was enhanced by the final, post-project survey.

5. Conclusions

As with other studies, a multi-faceted practice-based education program improved nurses knowledge of delirium. The focus on knowing, meaning and doing provided participants with different ways to engage in learning, and may have enhanced uptake. The ways that this understanding is shared by nurses through their everyday work relations requires further exploration. Understanding how nurses' learning through engagement in the three element program was translated to other nurses, particularly those who were unable to attend, is important to our understanding of how cultures of practice can be transformed.

Conflicts of interest

There are no conflicts of interest to report.

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Ethical approval details

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Appendix A. Supplementary data

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