Original Article

Effectiveness of an advanced practice nurse-led delirium education and training programme

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Aim: To develop an education and training programme to enhance bedside nurses' knowledge, competency and compliance in accurately performing delirium screening in intensive care units.

Background: Delirium in intensive care units is associated with several poor patient outcomes. Delirium detection can be improved by enhancing nurses' knowledge, competency and compliance in accurately performing delirium screening.

Methods: A descriptive quantitative study with pretest–post-test design was adopted. There were 245 nurses from five intensive care units who participated in the study. Multiple-choice questions were used to assess nurses' knowledge change before and after the education programme. Competency was assessed before and 2 months after the programme by simulation with a standardized patient, followed by real patients at the bedside. Compliance data on screening were collected from the documentation of the Richmond Agitation–Sedation Scale and the Confusion Assessment Method for the ICU before and 3 and 10 months after the programme. Data collection took 1 year, from June 2014 to May 2015.

Results: Despite nurses' improved knowledge and good competency, delirium screening documentations after 3 months were poor. However, screening documentations subsequently improved when measured at 10 months, following further emphasis by the senior nursing staff.

Implications for nursing practice and policy: Nursing administrators and bedside nurses need to be involved in the policy-making process and plan a training programme for the new nursing staff in the high-risk areas. A short refreshment course should be offered to the nursing staff 3 months after the initial training programme.

Conclusions: Improved knowledge and competency in assessment did not improve compliance and documentation of delirium screening. Therefore, it is important to reinforce nurses' compliance of delirium screening over time.

Keywords: Advanced Practice Nurses, Critical Care, Delirium Screening, Education, Intensive Care Unit, Nursing

Introduction

Delirium in intensive care units (ICUs) is prevalent in as many as 16–89% of patients and more common in those who are mechanically ventilated (Agarwal et al. 2010). ICU delirium is associated with longer intubation, increased lengths of ICU and hospital stay, decreased cognitive function and

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increased mortality (Ely 2016; Klein Klouwenberg et al. 2014; Mehta et al. 2015). Due to the high prevalence and morbidity rates associated with delirium and to avoid missing the diagnoses (Page 2010), the Society of Critical Care Medicine delirium guideline (Barr et al. 2013) suggests a routine screening of ICU patients with the Confusion Assessment Method for the ICU (CAM-ICU). The CAM-ICU was originally developed by Ely et al. (2001) and has been validated for delirium screening. The tool consists of four areas as a guide for delirium screening: acute change in mental status, fluctuation of mental status, altered level of consciousness, and disorganized thinking (American Association of Critical Care Nurses, 2013). Most ventilated patients are on sedation medication, and the Richmond Agitation–Sedation Scale (RASS) is normally used to assess the depth of sedation and whether the patients are alert enough to be assessed by the CAM-ICU (Steinseth et al. 2018). Therefore, the RASS and the CAM-ICU are used concurrently when performing delirium screening.

Although ICU delirium is recognized as a serious problem, one report indicated that ICU healthcare professionals have been struggling with the routine screening and management of delirium in patients (Brummel et al. 2013). Elliott's study (2014) found that 44% of healthcare professionals lacked ICU delirium knowledge, and delirium screening was not performed even though a validated delirium screening tool was available. Similar to Bannon et al.'s study (2018), the major barriers for routine delirium screening were related to unfamiliarity with the screening tools and a lack of knowledge among ICU healthcare professionals. With frequent patient contact, bedside nurses are in a strategic position to observe early physical and mental status changes. Therefore, they are recognized as the key professionals to screen for delirium (Piao et al.2016). Several studies found that a lack of education and training in nurses in clinical settings where delirium is prevalent is known to cause under-diagnoses of the condition (Bannon et al. 2018; Hamdan-Mansour et al. 2010).

Several previous studies have used didactic lectures to improve staff knowledge (Gesin et al. 2012; Vasilevskis et al. 2011), checklists to improve compliance (Riekerk et al. 2009), or a combination of lectures and scenario-based education (Devlin et al. 2008). However, these education programmes did not include any hands-on session to practice and subsequently assess nurses' competency of delirium screening.

Background of the study

At a tertiary hospital in Singapore, there was evidence of a lack of documentation of the delirium statuses of patients in the clinical information system (CIS). The ICU team, consisting of advanced practice nurses (APNs) and physicians, conducted a survey among ICU nurses ($N = 245$) to understand the current states of using sedation (RASS) and delirium (CAM-ICU) scores. The results showed major deficiencies of knowledge and confidence. Approximately half of the nurses (40–50%) were not confident in performing assessments as well as recognizing and managing delirium. The majority of the nurses (73%) were unsure of how to deal with delirious patients, while 89% of the nurses felt that delirium assessments had impacts on their patients. The vast majority (81%) of the nurses identified their inadequate knowledge as a barrier to recognizing ICU delirium.

On the other hand, although the majority of the nurses were aware of existing policy and practices on sedation and delirium, they were not confident in performing the screening and assessment. Nurses acquired their skills mostly by apprenticeship without any formal training, and delirium assessment and management training programme were very limited at that point of time. The APNs had concerns about the results and decided to conduct a study. The aim of this study was to develop an education and training programme to enhance bedside nurses' knowledge, competency and compliance in accurately performing delirium screening in ICUs.

Methods

Design and settings

A descriptive quantitative study design with pretest–post-test was adopted for this study. It was conducted at a 1200-bed tertiary hospital in Singapore that has five adult ICUs: (1) medical ICU (MICU, 20 beds, 81 registered nurses (RNs)), (2) mixed medical-surgical ICU (MS-ICU, 8 beds, 34 registered nurses (RNs)), (3) surgical ICU (SICU, 13 beds, 54 registered nurses (RNs)), (4) cardiothoracic ICU (CTICU, 15 beds, 51 registered nurses (RNs)) and coronary care unit (CCU, 18 beds, 63 registered nurses (RNs)). Each ICU is covered by trained medical intensivists (1–2 consultants) during office hours (8AM–5PM) with one to two fellow(s), six to eight residents and two to three APNs. The nurse-to-bed ratio is 1:1 or 1:2 depending on patients' acuity levels, and nurses work in three shifts per 24 h. Routinely, RASS and CAM-ICU monitoring was done every 4 and 8 h, respectively, and whenever patients' clinical statuses changed. All the clinical data, scores (e.g. RASS, CAM-ICU) and nurses'/doctors'/other healthcare professionals' assessments were recorded in the ICU CIS. Bedside nurses entered the manual data in real time, and the data were validated by a second nurse.

Participants

Participants included all registered nurses (RNs), nurse clinicians and APNs from five adult ICUs ($N = 292$). Nurse

managers, nurse educators, student nurses and enrolled nurses who did not perform sedation and delirium screening were excluded. Nurses who agreed to attend the training were also given protected time for their participation in the training programme. However, 42 nurses did not attend the training, and five nurses did not sign a consent form. As a result, 245 nurses participated in this study (83.9%). During the programme, no participant dropped out from the study. More details about the participants are presented in Table 1.

Table 1 Demographic data of the participants ($N = 245$)

Demographic	*Frequency (%)*
Age (years old)	
>30	124 (50.6)
≤30	121 (49.4)
Gender (%)	
Female	230 (93.9)
Male	15 (6.1)
Designation (%)	
Registered Nurse	165 (67.3)
Senior Staff Nurse	65 (26.5)
Nurse Clinician	9 (3.7)
Advanced Practice Nurse	6 (2.5)
Location (%)	
MICU	64 (26.1)
CCU	60 (24.5)
CTICU	47 (19.2)
SICU	43 (17.6)
MS-ICU	31 (12.6)
Years in location (%)	
>3	144 (58.8)
≤3	101 (41.2)
Years in nursing (%)	
≤10	169 (69)
>10 years	76 (31)
Qualification (%)	
Bachelor's degree	167 (68.2)
Diploma in nursing	67 (27.3)
Master's degree	10 (4.1)
Missing data	1 (0.4)
Prior training in ICU Delirium (%)	
No	133 (54.3)
Yes	111 (45.3)
Missing data	1 (0.4)
Type of training (%)	
Missing data	133 (54.4)
In-service	98 (40)
Conference/workshop	8 (3.2)
Self-directed learning	4 (1.6)
Formal academic training	2 (0.8)
Awareness of existing policy (%)	
Yes	166 (67.8)
No	45 (18.4)
Don't know	33 (13.4)
Missing data	1 (0.4)
Awareness of existing practice (%)	
Yes	213 (86.9)
No	18 (7.3)
Don't know	13 (5.4)
Missing data	1 (0.4)

CCU, Coronary Care Unit; CTICU, Cardiothoracic Intensive Care Unit; ICU, Intensive Care Unit; MICU, Medical Intensive Care Unit; MS-ICU, Mixed Medical-Surgical Intensive Care Unit; SICU, Surgical Intensive Care Unit.

Delirium education and training programme

The delirium education and training programme was developed based on delirium assessment methods and literature reviews (Ely et al. 2001; Ely, 2016; Kowitlawakul et al. 2015). The delirium education sessions were conducted by four APNs. Initially, one senior ICU physician and a nurse-educator extensively trained the APNs on sedation and delirium. Subsequently, these APNs were considered as content experts. Three to nine senior staff nurses were selected from each ICU and trained by the APNs to be the unit expert raters. The unit expert raters' role was to assist the study team in one-to-one bedside training of the participants in their respective units and sustainment of the trained behaviours and skills practices following the programme. The APNs achieved a 95% inter-rater reliability (IRR) among themselves to ensure that all future assessments were standardized. Subsequently, all unit expert raters were compared with APNs based on the assessments of 10 patients each and considered as reference standard judges only when IRR was at least 90%.

The training programme consisted of three sessions: (1) didactic lecture session 1 (S1), (2) didactic lecture session 2 (S2), and (3) simulation and practice at bedside-session 3 (S3). The S1 and S2 session consisted of 1.5-h and covered background knowledge and case studies on RASS and CAM-ICU assessments. Over a period of 7 weeks, the APNs conducted 28 S1 and S2 sessions with an average of 20 nurses per session. The S3 was a 1-h simulation, using a standardized patients (SP), followed by assessment of real patient at the bedside and conducted by both APNs and unit expert raters of the respective ICUs. For both SP and real patient assessments, the team followed the delirium assessment method described by Ely et al. (2001).

During S3, the SP and real patients were first tested for acute onset and/or fluctuating course of mental status (information supplied for SPs) followed by assessment using the SAVEHAART mnemonic for the letters inattention test. The nurse would say to patient, 'I am going to read you a series of 10 letters. Whenever you hear the letter 'A', please indicate by squeezing my hand'. Then, the nurse would read 'S A V E

A H A A R T' in a normal tone that was loud enough to be heard at a rate of one letter every 3-s to the patient. Four yes/no questions were used to assess disorganized thinking (Ely, 2016). During the simulation sessions, one APN acted as a SP and a group of five to six nurses would practice individually. After the simulation session with the SP, the unit expert rater would assess each participant on a selected patient at the bedside who was not in the care of the participant on that day. The procedure included having the unit expert rater perform the RASS and CAM-ICU assessment on the same patient immediately after the participant had completed the assessments followed by comparison of the scores. The participant was blinded to the expert rater's ratings and offered corrective teaching to improve competency if two scores were different, and a reassessment would be scheduled 3 days later. The study team conducted the education programme over 7 weeks from June to July 2014.

Data collection and ethical considerations

The Institutional Ethics Board (domain specific ethics review board of the National Healthcare Group) approved the study. Each participant received one envelope that included an information sheet, a consent form and a multiple-choice question (MCQ) paper upon arrival at the first session. The MCQs were developed based on literature review and the contents of the education programme. Content validity and ease of answering were tested by 10 APNs from five ICUs who had at least 10 years working experience in ICUs and were not part of the training cohort.

Each envelope had a serial numerical coding number, with letter A and B representing the pre-programme and post-programme tests, respectively. The coding number was attached to an individual identifier, known only to the study team members. The potential participants were briefed about the research portion and that it was voluntary. Consents were obtained prior to the training, and nurses who did not want to participate could leave at any time. At the start of the first session (pre-programme), a 30-min MCQs on the knowledge of ICU delirium and the RASS and CAM-ICU assessment tools (56 items) was undertaken by the participants. The same method was applied for the post-test after the completion of the second session, which consisted of the same items but in different sequences. The participants returned the answered MCQs to a located box within 1 week after S2. Due to the different training schedules, all participants were not tested at the same time.

The demographic data of the participants, including qualifications and years in nursing, were collected anonymously at the beginning of the first session. Competency was assessed by the trained APNs during simulation with standardized patients and real patients at the bedside. The competency data were collected before the programme from randomly selected 10 nurses per unit (total 50 nurses) 2 months after the training programme. Compliance data in performing the two assessment tools (RASS and CAM-ICU) were collected in all units from the computerized chart review for 1 month each before the programme and at 3 and 10 months after the programme. Compliance was calculated on a unit-wide basis and not per individual nurse.

Data analysis

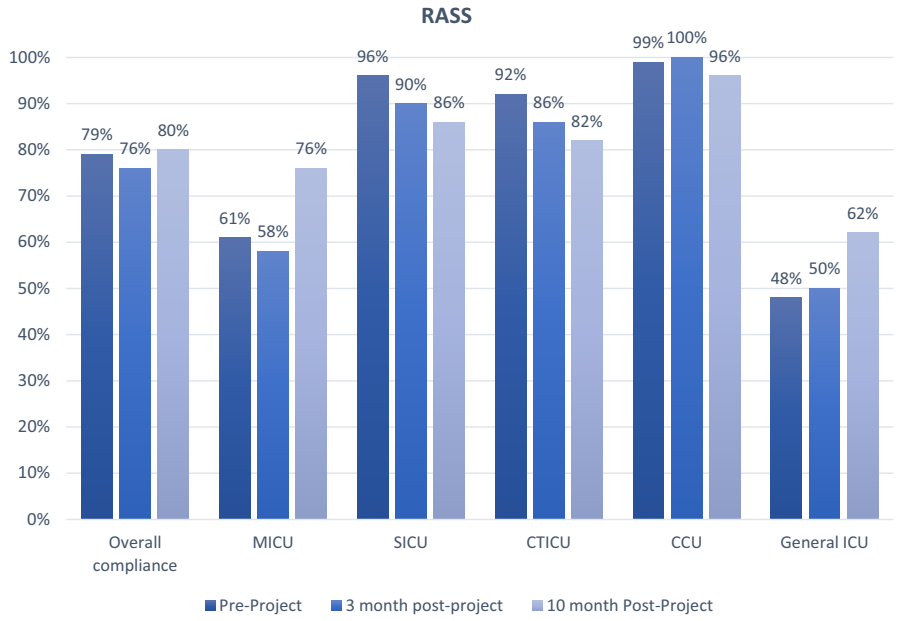
Descriptive statistics (frequency and percentage) were used to describe the participants' profiles (e.g. age, gender) and the compliance rates (as percentage) of nurses using the RASS and the CAM-ICU. Paired *t*-test was used to compare the score of knowledge pre- and post-programme. All comparisons were two-sided, and $P < 0.05$ was considered significant. Competency data were assessed by using a checklist before and 2 months after the education and training programme. Compliance rate was calculated by the total number of documented assessments per 24 h and divided by the total minimum standard for the respective scale (i.e. at least six RASS assessments and three CAM-ICU assessments per 24 h) for all the patients that were admitted in the individual unit for the audited month. SPSS 20.0 (IBM Corp., Armonk, NY, USA) was used to analyse the data.

Results

Demographic data and test score

Table 1 shows the demographic characteristics of the participants, such as age, gender, qualifications and years in nursing. The cohort was predominantly female registered nurses (RNs) holding a bachelor's qualification with <10 years of experience. Most (40%) were trained in-service and received no formal training in ICU sedation and delirium screening tools. However, the majority (69–87%) were aware of existing unit policy and current practices. Test scores improved significantly following the education programme (pre-programme vs. post-programme score mean $\pm$ SD 38.73 ± 4.85 vs. 48.24 ± 3.806, $P < 0.001$), suggesting improved knowledge. All participants passed the competency test 2 months after the programme.

Computerized chart reviews for the RASS and the CAM-ICU documentation were performed before the education programme (May 2014) and 3 months after the training programme in October 2014. Figure 1 shows the progress of the



NO = Number of observations

Fig. 1 Compliance rates of Richmond Agitation–Sedation Scale (RASS) score in ICUs.

compliance for RASS scores, and Fig. 2 shows the progress of the compliance for CAM-ICU scores.

Results 3 months after the programme were inconsistent. Several ICUs (SICU, CTICU and CCU) had high compliance with RASS scores at the start of the programme (92–99%), and they either did not show any further improvement or small deterioration 3 months post-programme. RASS compliances in MICU and MS-ICU were low at the beginning of the programme (61% and 48%, respectively) and stayed low (58% and 50%, respectively) after 3 months. Although the overall CAM-ICU score compliance had increased with some units showing improvement (SICU and CCU), others showed decreased compliance (MICU and CTICU). However, competency checked in 10 nurses randomly selected per unit (total 50 nurses) 2 months after the training programme showed IRR between the expert raters and the sample number of nurses to be 95%.

Compliance was again measured 10 months post-programme (May 2015). The RASS scores (Fig. 1) in MICU and MS-ICU improved, while other units (SICU, CTICU and CCU) maintained their overall compliance (82–96%). There was a significant improvement in compliance with CAM-ICU documentations. Most units showed higher compliance, except in the SICU where it dropped after initial improvements (Fig. 2).

Discussion

The aim of this study was to develop an education and training programme to enhance bedside nurses' knowledge, competency and compliance in accurately performing and documenting delirium screening in ICUs. In this study, the deficiency in the system was established by a team of the APNs who subsequently lead the project. The passionate champions were self-selected from the same group of people destined to be trained later. With the target participants being nurses in ICUs who were trained by their own seniors, education and training sessions were popular and ran seamlessly. The assessment of a patient's sedation level is an important part of delirium screening, and the training included both RASS and CAM-ICU tools. Since the study covered all adult ICUs, one uniform assessment tool was selected and standardized procedures to reduce confusion and improve clarity (Devlin et al. 2008). This way, data collection was uniform and easily comparable between units.

According to the study's results, didactic lectures with case studies were effective in improving nurses' knowledge. The education and training intervention studies of ICU delirium mostly attempted to improve knowledge, and they have been recommended for ICU staff (Ely 2016; Gesin et al. 2012). Middle & Miklancie (2015) also addressed that didactic and case studies were useful and effective in enhancing nursing

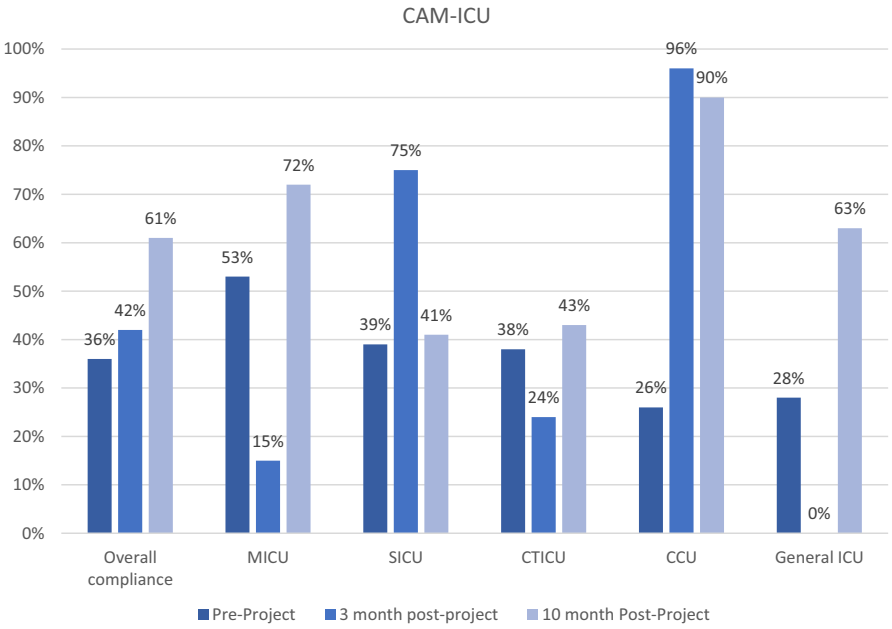


Fig. 2 Compliance rates of Confusion Assessment Method-Intensive Care Unit (CAM-ICU) in ICUs.

staff delirium knowledge. In this study, knowledge improvement was evident after the two lectures, which was similar to the previous studies (Ely 2016; Gesin et al. 2012). Hence, it is recommended that didactic lectures with case studies can help to enhance nurses' knowledge of delirium in ICUs in the short term.

Simulation is a useful method to facilitate the understanding of delirium management (Robles et al. 2017), and simulation based-learning using SPs is also useful for developing communication skills (Kowitlawakul et al. 2015). The use of SP for simulation in this study is a new addition to the delirium education and training programme. This teaching method provides the learners with the opportunity to practice delirium screening and communicating before approaching real patients. Training at the bedside has also been found to be a relevant method for teaching ICU delirium and CAM-ICU screening (Elliott 2014). This was included in this study as it provided a combination of both theory and practical application. The simulation with SPs followed by delirium assessment with real patients was effective in improving the skills of the nurses as measured by competency check 2 months after the programme.

In the current study, it was evident that low compliance of the CAM-ICU documentation 3 months after the programme was not due to the lack of knowledge or competency. Similar to Stewart & Bench's study (2018), delirium screening had increased initially, but it was not sustained over time. There may be several reasons why an improved understanding and knowledge of delirium and sedation in ICUs did not automatically translate into better compliance. Firstly, delirium assessment is a complex stepwise time-consuming process and, in most hospitals, done as a part of research. Secondly, the delirium protocol has been incorporated in the mainstream ICU assessments (Barr et al. 2013). Among the many and ever-increasing protocols in ICUs, staff may find little time for another complex assignment. Thirdly, repeated measurement requirements for delirium also make it laborious and difficult to adopt. Lastly, delirium in ICUs is usually related to many factors; the assessment of delirium does not directly translate into an immediate improved outcome. The lack of definite direction about its prevention and treatment also makes screening less attractive. Further investigation on the possible low compliance of RASS and CAM-ICU documentations 3 months after the programme is highly recommended.

According to the quality improvement in ICUs, once the lack of compliance was recognized, the respective unit expert raters and nurse managers have encouraged the delirium screening practice. Encouraging delirium practice is a common method used in ICUs when a low compliance of documentation is recognized. As a result, the RASS score and the CAM-ICU documentation in all ICUs maintained a high

overall compliance 10 months after the programme. Regular reinforcement is essential to sustain high compliance of delirium assessment (Ramoo et al. 2018). Nursing administrative team plays a significant role for the successful implementation of the delirium assessment practice in order to sustain high compliance of CAM-ICU documentation.

Limitations

The pre-programme survey identified several barriers. However, this study could only address the education and training of nurses as these were most likely to improve knowledge, competency and compliance. Other barriers are not possible to improve currently (e.g. CAM-ICU is too difficult and complex, delirium assessment is too time-consuming) or not addressed in this project (e.g. lack of physician support, lack of action to be taken following positive results). The results only represent a single hospital. Therefore, a replicated study is recommended in other institutions to validate the education and training programme and to generalize the findings. Data on the incidences of delirium in different ICUs before and after the programme were not collected. During the MCQ assessment, a post-programme test was arranged only 3 days after the pre-programme test to assure maximum participation. This may have introduced recall bias during the post-programme test and affected the score.

Implications in nursing practice and policy

The study's results indicated that improved knowledge does not automatically translate into better practice. Hence, the reinforcement of delirium detection knowledge and practice after the training programme by nursing administrators/managers should be undertaken. It is recommended that the delirium education and training programme should include (1) a systematic process of the pre-programme identification of barriers by using survey, observation of practice or interviews, (2) theoretical lectures with case studies, simulations using SPs and practice with real patients, and (3) a refreshment course that is offered 3 months after the programme. Nurses' specific education needs and addressing personal beliefs about delirium should be considered when planning for a delirium programme (Zamoscik et al. 2017). Furthermore, providing more education on caring for delirious patients and supportive networks could enhance the confidence of nurses in caring for and assessing delirious patients (Zamoscik et al. 2017). Compliance documentation audit is a demanding task on the workforce. However, advanced technology, including computerized data, can be useful in auditing the compliance of delirium detection/documentation in ICUs. The motivation of beside nurses, the involvement of passionate champions and the support of senior leadership should be emphasized.

It has been recommended that all nurses in different levels should be involved in policy-making process (Turale 2017). Based on the evidence in this study, bedside nurses, APNs and nursing administrators can recommend the policy makers to incorporate the delirium assessment training in the orientation programmes for newly recruited ICU nurses and in annual performances criteria for individual nurses. These policies will help to cultivate nurses' awareness of delirium screening to emphasize that delirium assessments are necessary and important. According to prevention and treatment of delirium, hospital policies should include the training and routine checking of delirium using CAM-ICU in the high-risk areas, such as ICUs, post-operative and geriatric ward, and following up patients after the delirium screening. Medications, background health issues, pre-existing cognition impairment should be emphasized during the follow-up. This work forms part of a related strategy that not only incorporates delirium assessment, but also incorporates initiatives specifically designed to help reduce delirium in ICU patients.

Conclusions

The study bridges several gaps in understanding of practical issues regarding delirium screening in ICUs. The pre-programme survey suggested poor confidence among the nurses in the recognition of delirium and performing RASS and CAM-ICU screening. A lack of proper training and poor knowledge were identified as major barriers. Following a comprehensive education programme, knowledge among ICU nurses was increased, but this did not translate into improved compliance in screening and documentation. Further emphasis on compliance has improved the RASS and CAM-ICU documentation suggesting the need for continuous vigilance and periodic audits. Future education programmes might need to emphasize the sustainability of knowledge and the compliance of screening and documenting. The effectiveness of the education programme which includes hands-on training on early detections of delirium in ICUs is highly recommended for future study. The influence of ICUs' cultures and nurses' perceptions towards delirium screening using the CAM-ICU might be another interesting area for future research studies.

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Author contributions

Study design: JLML, FSMC, GS, PST, YK, AM
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Manuscript writing: JLML, FSMC, GS, PST, YK, AM
Critical revisions for important intellectual content: YK, AM

References

Agarwal, V., et al. (2010) Prevalence and risk factors for development of delirium in burn intensive care unit patients. *Journal of Burn Care and Research*, **31**, 706–715.

American Association of Critical Care Nurses (2013) *Confusion Assessment Method for the ICU (CAM-ICU): Worksheet*. Available at: https://www.aacn.org/docs/EventPlanning/WB0016/Delirium-CAM-ICU-gwgqydl2.pdf (accessed 2 December 2018).

Bannon, L., et al. (2018) Designing a nurse-delivered delirium bundle: what intensive care unit staff, survivors, and their family think? *Australian Critical Care*, **31**, 174–179.

Barr, J., et al. (2013) Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. *Critical Care Medicine*, **41**, 263–306.

Brummel, N.E., et al. (2013) Implementing delirium screening in the intensive care unit: secrets to success. *Critical Care Medicine*, **41**, 2196–2208.

Devlin, J.W., et al. (2008) Combined didactic and scenario-based education improves the ability of intensive care unit staff to recognize delirium at the bedside. *Critical Care*, **12**, R19.

Elliott, S. (2014) ICU delirium: a survey into nursing and medical staff knowledge of current practices and perceived barriers towards ICU delirium in the intensive care unit. *Intensive and Critical Care Nursing*, **30**, 333–338.

Ely, E.W. (2016) *Confusion assessment method for the ICU (CAM-ICU). The complete Tranining Manual*. Available at: http://www.icudelirium.org/docs/CAM-ICU-training-manual-2016-08-31_Final.pdf (accessed 15 January 2018).

Ely, E.W., et al. (2001) Delirium in mechanically ventilated patients: validity and reliability of the confusion assessment method for the intensive care unit (CAM-ICU). *Journal of the American Medical Association*, **286**, 2703–2710.

Gesin, G., et al. (2012) Impact of a delirium screening tool and multifaceted education on nurses' knowledge of delirium and ability to evaluate it correctly. *American Journal of Critical Care*, **21**, e1–e11.

Hamdan-Mansour, A.M., Farhan, N.A., Othman, E.H. & Yacoub, M.I. (2010) Knowledge and nursing practice of critical care nurses caring for patients with delirium in intensive care units in Jordan. *Journal of Continuing Education in Nursing*, **41**, 571–576.

Klein Klouwenberg, M.C., et al. (2014) The attributable mortality of delirium in critically ill patients: prospective cohort study. *British Medical Journal*, **349**, g6652.

Kowitlawakul, Y., Chow, Y.L., Salam, Z.H.A. & Ignacio, J. (2015) Exploring the use of standardized patients for simulation-based learning in preparing advance nurses. *Nurse Education Today*, **35**, 894–899.

Mehta, S., et al. (2015) Prevalence, risk factor, and outcomes of delirium in mechanically ventilated adults. *Critical Care Medicine*, **43**, 557–566.

Middle, B. & Miklancie, M. (2015) Strategies to improve nurse knowledge of delirium. *Clinical Nurse Specialist*, **29**, 218–229.

Page, V. (2010) Optimum sedation and delirium assessment in the ICU. *Journal of the Intensive Care Society*, **11**, 8–11.

Piao, J., Jin, Y. & Lee, S.-M. (2016) Triggers and nursing influences on delirium in intensive care units. *British Association of Critical Care Nurses*, **23**, 8–15.

Ramoo, V., et al. (2018) Educational intervention on delirium assessment using confusion assessment method-ICU (ICU-CAM) in a general intensive care unit. *Journal of Clinical Nursing*, **27**, 4028–4039.

Riekerk, B., Pen, E.J., Hofhuis, J.G., Rommes, J.H., Schultz, M.J. & Spronk, P.E. (2009) Limitations and practicalities of CAM-ICU implementation, a delirium scoring system, in a Dutch intensive care unit. *Intensive Critical Care Nurse*, **25**, 242–249.

Robles, M.J., et al. (2017) Simulation of a clinical scenario with actresses in the classroom: a useful method of learning clinical delirium management. *European Geriatric Medicine*, **8**, 474–479.

Steinseth, E.B., Hoye, S. & Hov, R. (2018) Use of CAM-ICU during daily sedation stops in mechanically ventilated patients as assessed and experienced by intensive care nurses: a mixed-methods study. *Intensive and Critical Care Nursing*, **47**, 23–29.

Stewart, C. & Bench, S. (2018) Evaluating the implementation of confusion assessment method-intensive care unit using a quality improvement approach. *Nursing in Critical Care*, **23**, 172–178.

Turale, S. (2017) Nurses and midwives engaging in policy and policy development. *International Nursing Review*, **64**, 3. Doi: 1111/inr.12361

Vasilevskis, E.E., et al. (2011) Delirium and sedation recognition using validated instruments: reliability of bedside intensive care unit nursing assessments from 2007 to 2010. *Journal of the American Geriatrics Society*, **59**, S249–S255.

Zamoscik, K., Godbold, R. & Freeman, P. (2017) Intensive care nurses' experiences and perception of delirium an delirium care. *Intensive and Critical Care Nursing*, **40**, 94–100.