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Research article

Comparing the delirium objective structured clinical examination (OSCE) education package to standard education for post-registration nurses: A randomised controlled trial

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ABSTRACT

Background: A recent pilot study demonstrated that an interactive delirium educational intervention, *The Delirium OSCE Education Package,* had a positive impact on self-perceptions of confidence and competence in the use of delirium assessment tools and delirium knowledge; delirium knowledge scores; clinical practice; and planned practice change for participants. However, it is not known if *The Delirium OSCE Education Package* is superior to standard methods of professional development education.

Objective: To determine if *The Delirium OSCE Education Package* is superior to standard methods of professional development education on observations of delirium care in practice scores for post-registration nurses.

Design: Clustered randomised, controlled, and observer-blinded, multisite superiority trial with two parallel groups at each site.

Settings: Three private hospitals across New South Wales, Australia.

Participants: Registered nurses (RNs) ($n = 153$) or enrolled nurses (ENs) ($n = 37$) working in the eligible inpatient medical or surgical wards at each site.

Methods: Within each hospital site wards were clusters, with wards rather than individuals being randomised for *The Delirium OSCE Education Package* or standard professional development education at a ratio of 1:1. The primary outcome was observations of delirium care in practice, 6-weeks post (T1) allocated intervention. Secondary outcomes were self-perceived confidence and competence (self-efficacy) in delirium assessment tools and delirium knowledge; and delirium knowledge scores.

Results: A total of 51.3 % ($n = 20$) in the intervention group obtained a satisfactory observation of delirium care in practice score, compared to 34.9 % ($n = 15$) in the control group ($p = 0.134$, χ^2). The odds of a satisfactory observation of delirium care in practice score for the intervention group was 10.1 times higher than the control ($p = 0.009$). The mean MCQ score and perceptions of confidence and competence in the intervention and control group increased from baseline to six-weeks post-intervention, however, there was no significant difference between the groups.

Conclusion: The Delirium OSCE Education Package provides the foundation for facilitating change in delirium care. It is recommended that *The Delirium OSCE Education Package* is implemented as part of a multicomponent strategy involving a validation delirium screening and assessment tool, hospital-specific policy, interprofessional education, and delirium champions. Future studies are needed to evaluate the sustainability of the intervention and if there is a positive impact on patient-level outcomes.

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1. Background

Unfortunately, delirium is often neglected in clinical settings with more than a third remaining undiagnosed (Casey et al., 2019). Under-recognition of delirium must be addressed to prevent the negative and, sometimes, fatal outcomes of missing delirium (Griffiths et al., 2013; Zamoscik et al., 2017). In Australia, the Australian Commission on Safety and Quality Heath Service Standard (Australian Commission on Safety and Quality in Health Care (ACSQHC), 2017) mandates that hospitals incorporate best practice strategies for early recognition, prevention, treatment, and management of cognitive impairment, including delirium. This includes minimum screening of delirium using a validated tool. However, implementing mandatory delirium screening without supporting education may lead to inaccurate detection of delirium (Hosie et al., 2015).

There are several barriers to delirium detection and care, which include low levels of knowledge, lack of education, and negative attitudes about delirium (Morandi et al., 2013; Teodorczuk et al., 2012). Evidence shows that inadequate education attributes to low levels of confidence, stress, and anxiety when providing delirium care (Thomas et al., 2021). Delirium educational interventions that use a multi-modal approach and involve practical sessions, such as simulation have the potential to address the barrier to delirium detection and care (Yanamadala et al., 2013). To address the barriers to delirium detection and care an interactive delirium educational intervention, *The Delirium OSCE Education (DOE) Package,* was developed and pilot-tested (Montgomery et al., 2024). *The DOE Package* includes a form of simulation using objective structured clinical examinations (OSCEs) (Harden and Gleeson, 1979).

The DOE pilot study was conducted using a convenience sample of registered healthcare practitioners (enrolled nurses, registered nurses, medical doctor, occupational therapists, and physiotherapists) working at two metropolitan hospital sites in Australia (Montgomery et al., 2024). The DOE pilot study demonstrated that *The DOE Package* had a positive impact on self-perceptions of confidence and competence in the use of delirium assessment tools and delirium knowledge; delirium knowledge scores; clinical practice; and planned practice change for participants (Montgomery et al., 2024). However, it is not known whether *The DOE Package* is superior to standard methods of professional development education. The DOE RCT study is aimed at investigating the effect of the interactive delirium education intervention, *The DOE Package*, compared to standard methods of professional development on translating best practice delirium care into clinical practice.

1.1. Objectives

The primary objective of the DOE RCT study was to determine if *The DOE Package* is superior to standard methods of professional development on observations of delirium care in practice scores for post-registration nurses. It was hypothesised that six-weeks after the education, the intervention group will have a higher rate of satisfactory observation of delirium care in practice scores than the control group. Secondary aims were to evaluate the effect of the intervention on self-perceived confidence and competence in delirium assessment tools and delirium knowledge; and delirium knowledge scores.

2. Methods

2.1. Trial design and setting

The DOE RCT study was a clustered randomised, controlled, and observer-blinded, multisite superiority trial with two parallel groups at each site to compare *The DOE Package* to standard methods of professional development. The study protocol was prospectively registered through the Australian New Zealand Clinical Trials Registry (ANZCTR). Trial registration number (ACTRN12619000893101). The design of this study follows the CONSORT guidelines (Moher et al., 2010) to aid transparency of reporting. This study was conducted in three private hospitals in New South Wales (NSW), Australia, that indicated their willingness to participate after approaches to senior management. Site 1 and Site 2 are in Metropolitan Sydney, and Site 3 is in Regional NSW with capacity for 280, 142, and 73 patients, respectively. Each site offers a comprehensive range of acute medical, surgical, and rehabilitation services. The two metropolitan sites also offer maternity, paediatrics, and intensive care units. Prior to the study, the sites did not have a validated delirium assessment tool embedded into practice. The sites selected the 4AT to be implemented as the validated delirium assessment tool (Bellelli et al., 2014).

Within each hospital, site wards were clustered, and wards rather than individuals were randomised. Thus, the unit of randomisation was the ward. This method was adopted to minimize the risk of contamination within wards and to ensure equity of access to at least a minimum of the control educational activities at each site.

2.2. Eligibility

There were two factors for eligibility: type of ward and practitioners. Inpatient medical and surgical wards at the three participating private hospitals were eligible. Outpatient, maternity, paediatric, day stay, operating theatre, recovery, and intensive care units were excluded from the study. Staff working on the inpatient medical and surgical wards were eligible to participate if they were an enrolled nurse (EN) or registered nurse (RN). Unregulated staff (healthcare aids and assistants in nursing) were ineligible.

2.3. Intervention

The intervention group received *The DOE Package* developed by the research team and previously pilot-tested (Montgomery et al., 2024) (Fig. 1). The intervention was developed based on the Delirium Clinical Care Standard (Australian Commission on Safety and Quality in Health Care (ACSQHC), 2016) and OSCE best practice guidelines (Daniels and Pugh, 2017; Kelly et al., 2016; Nulty et al., 2011). The education was delivered during each site's usual protected professional development time. *The DOE Package* was delivered over approximately two-months. Fig. 2 provides an overview of *The DOE Package*.

The DOE Package had two face-to-face components under clinical supervision:

1) Part One: group face-to-face education sessions were delivered by a senior registered nurse (RN) and included a 'take away' delirium care booklet entitled 'Delirium Care-what you need to know' (60-min).
2) Part Two: a one-on-one objective structured clinical examination (OSCE) was conducted by a senior RN using a simulated patient scenario role played by an assistant in nursing (AIN) or nursing student (30-min). The OSCE was divided into a five-minute pre-briefing, a 15-min scenario, and a 10-mintue briefing consisting of formative feedback and a 7-item OSCE rubric.

There were also two unsupervised optional components to complete involving (these options were not monitored nor submitted to the research team for evaluation):

(i) watching two filmed delirium care vignettes. The vignettes showed a nurse conducting a delirium screen using a validated tool (one vignette involving hypoactive delirium and the other involving hyperactive delirium) (total of 15-min); and
(ii) a paper-based individual self-reflection exercise consisting of four questions to prompt participants to reflect on an experience with caring for a patient with delirium (15-min).

The control group received only the usual group face-to-face

education session (60 min) (Part One) provided to healthcare practitioners as part of their standard professional development education within the hospital setting (Fig. 1).

2.4. Outcome assessment

The primary outcome was the ability to obtain a satisfactory observation of delirium care in practice score at six-weeks post (T1) completion of the participants' allocated intervention (Fig. 1).

The observation of delirium care in practice was evaluated at Site 1 using a 10-item (maximum score of 12) validated structured observation of delirium care in practice tool developed by the team (Appendix A). The tool was developed in consultation with delirium experts and best practice clinical guidelines (Australian Commission on Safety and Quality in Health Care (ACSQHC), 2021; National Institute for Health and Care Excellence (NICE), 2019) and piloted-tested (Montgomery et al., 2024). Inter-rater reliability testing of the observation of delirium care in practice tool was undertaken by two trained data collectors simultaneously observing a convenience sample of participants undertaking a delirium assessment using the 4AT and independently completing the tool to record the clinical practice observed. The data were used to compute an index of agreement between data collectors and a 97 % consensus was achieved for the overall score.

Following data collection at Site 1, the tool was modified to a 15-item structured observation of clinical practice tool (maximum score of 16), to allow for greater sensitivity to completion of 4AT (Appendix B). This modification was undertaken in consultation with delirium clinical experts. For both tools, higher scores indicated a higher level of adherence to best practice delirium detection and care, and translation of learning into clinical practice. To account for the two different observation of practice tools, total scores were converted to a percentage.

The research team determined that a percentage of 85 % indicated satisfactory adherence to best practice delirium detection and care. Participants were categorised as satisfactory or unsatisfactory.

The secondary outcomes were assessed using a pilot-tested survey for all participants at baseline (T0) and six-weeks post (T1) completion of their allocated intervention (Fig. 1) (Montgomery et al., 2024). The survey was developed in SurveyMonkey (SurveyMonkey, 2020) and consisted of three components: (i) demographic information, (ii) self-efficacy, and (iii) delirium knowledge.

(i) Demographic information: seven questions asking participants their sex, age, clinical role, and educational level.
(ii) Self-efficacy: measured with four 5-point Likert scale questions asking participants to rate their confidence and competence on (1) their ability to use the delirium assessment tool and (2) overall knowledge about delirium, from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate a higher sense of self-perceived confidence and competence. In the pilot study, the internal consistency of the four Likert scale questions (Cronbach's α 0.90) revealed excellent reliability (Montgomery et al., 2024).
(iii) Delirium knowledge: measured using a 20-item multiple choice question (MCQ) delirium knowledge quiz, with higher scores indicating a greater knowledge of delirium care. The quiz was developed by the ADHERe team (Aged Dementia Health Education and Research (ADHERe), 2023) using the 'Delirium Clinical Care Standards' published in Australia (Australian Commission on Safety and Quality in Health Care (ACSQHC), 2016) and has been adapted based on a pilot study conducted by the research team (Montgomery et al., 2024).

The six-weeks post-intervention survey (T1) consisted of an additional five questions asking participants about the experience and impact of their allocated educational intervention. Two 3-point Likert scale questions asked participants to rate the impact of their allocated educational intervention on their confidence and competence on a scale from 1 (low) to 3 (high). Three open-ended questions asked about the impact of their allocated educational intervention.

2.5. Participant timeline

Data were collected between June 2019 and March 2021. The start time was staggered across the three sites: Site 1, Site 2, and Site 3 commenced in June 2019, August 2019, and October 2020, respectively.

2.6. Sample size

An integrative review undertaken to inform this study found no published studies that measured the effects of an interactive delirium educational program involving OSCEs on clinical practice (Montgomery et al., 2024). That is, no other study included in the integrative review used a structured observation of clinical practice tool to measure the effects of OSCEs on the clinical practice of their participants. Therefore, the sample size for this study was calculated from the effects measured using the observation of delirium care in practice tool from a pilot study conducted by the team (Montgomery et al., 2024). The pilot study had a dropout rate of 34.6 % to 48 %, depending on site. The mean observation of delirium care in practice score after participants completed *The DOE Package* education was 9.8 (SD = 0.9). A difference of 10 % in scores between the intervention and control groups was determined appropriate to investigate. To demonstrate a difference of 10 % with power of 80 % at a significance of 0.05, using an ANOVA comparison, a sample size of 11 in the intervention and control arm at each site was calculated. Given the dropout rate, it was determined that a recruitment target of 22 per arm per site is required. This equates to an overall recruitment target rate of 176.

2.7. Allocation

Randomisation took place within each hospital site. Eligible wards (clusters) at each hospital site were allocated an identifying number reference. Using computerised random numbers each ward was randomly allocated to either the intervention or control group using a 1:1 ratio. Randomisation occurred before any data were collected. Randomisation was undertaken by an investigator (A.M) and the allocation was not known to any other investigators or participants at the time of enrolment and completion of the baseline data collection. Eligible participants were allocated to either the intervention or control condition, based on the ward (cluster) that they work on.

2.8. Blinding (masking)

The study adopted a single-blind design. The observers undertaking the observation of delirium care in practice were blinded to the group assignment of each ward. The research team asked individual participants from the wards not to inform the independent observers, if they know, to the best of their ability. Further blinding was not feasible given the nature of the intervention.

2.9. Statistical methods

Data for the surveys and observations of delirium care in practice were analysed using IBM SPSS Statistics 28 (IBM Corporation, 2020) and STATA 17 (StataCorp, 2021) and checked for completeness and data entry errors. For this paper, only quantitative findings will be reported. Statistical consultation was undertaken prior to data analysis. Participants were given a unique identifying code to enable pre-post surveys to be paired. Descriptive statistics were used to compare baseline characteristics of the participants in the intervention and control groups. Variables are described using frequency, mean and standard deviation. The variable of interest was the intervention. *t*-tests and, Chi-Square tests were used where appropriate. A Bonferroni correction was used

where multiple comparisons occurred. Logistic regression models were used to assess association for the observation of delirium care in practice scores (expressed as the binary satisfactory/unsatisfactory). All models were adjusted for the potential confounding effects of age, years of experience, level of education, and site. Effect modification (interaction) was assessed between intervention and the other variables in the model. A 5 % two-sided significance level was used for main effects and 1 % for interactions. A generalised linear mixed model (GLMM) was used to compare MCQ scores and self-perceptions of confidence and competence between groups, allowing for the clustering design in our analysis and to control for confounding factors. For the 20-item MCQ delirium knowledge quiz, a total score was calculated. Answers were given equal weighting; missing answers were regarded as incorrect.

2.10. Ethical considerations

Human Research Ethics approval for the conduct of this trial was gained from the (University of Wollongong Health and Medical Human Research Ethics Committee) (HREC) prior to commencing recruitment and data collection (Approval No 2014/339). Written informed consent was obtained from individuals for observations of delirium care in practice and individual implied consent for surveys. As the education was conducted as part of usual professional development, implicit consent was used as those who chose not to participate in the research could choose to still participate in the educational intervention.

3. Results

A total of 190 participants were recruited into the study, of which 97 were recruited into the intervention group and 93 into the control group (Fig. 2). See Table 1 for demographic data.

Table 1
Demographic data.

	Intervention n = 97	Control n = 93	Test Statistic	P value
	N (%)	N (%)		
Sex				
Female	78 (80.4 %)	81 (87.1 %)	$\chi^2 = 1.55$	0.213
Male	19 (19.6 %)	12 (12.9 %)		
Employment				
Full-time	63 (64.9 %)	43 (46.2 %)	$\chi^2 = 6.87$	0.032
Part-time	32 (33.0 %)	46 (49.5 %)		
Casual	2 (2.1 %)	4 (4.3 %)		
Age				
<24 years	9 (9.3 %)	9 (9.7 %)	$\chi^2 = 2.39$	0.930
25–34 years	39 (40.2 %)	40 (43.0 %)		
35–44 years	14 (14.4 %)	11 (11.8 %)		
45–54 years	18 (18.6 %)	20 (21.5 %)		
55–64 years	15 (15.54 %)	10 (10.8 %)		
>65 years	2 (2.1 %)	2 (2.2 %)		
Missing	0 (0.0 %)	1 (1.1 %)		
Position				
Registered Nurse (RN)	81 (83.5 %)	72 (77.4 %)	$\chi^2 = 1.12$	0.290
Enrolled Nurse (EN)	16 (16.5 %)	21 (22.6 %)		
Highest level of education				
Vocational training	14 (14.4 %)	19 (20.4 %)	$\chi^2 = 5.92$	0.205
Hospital-based training	9 (9.3 %)	9 (9.7 %)		
Bachelor Degree	53 (54.6 %)	37 (39.8 %)		
Post Graduate Certificate	15 (15.5 %)	22 (23.7 %)		
Master Degree	3 (3.1 %)	6 (6.5 %)		
Mean Years of Experience	11.4 (SD 11.0)	13.6 (SD 11.7)	$t = -0.62$	0.223

χ^2 = Chi Square; t = t-test.

3.1. Observations of delirium care in practice

Of the 97 participants recruited into the intervention group, 65 completed *The DOE Package* (completion rate 67 %) (Fig. 2). Then 39 out of the 65 (60 %) participants in the intervention group, and 43 out of the 93 (46 %) participants in the control group had an observation of delirium care in practice undertaken (Fig. 2). A total of 51.3 % ($n = 20$) in the intervention group obtained a satisfactory observation of delirium care in practice score, compared to 34.9 % ($n = 15$) in the control group ($\chi^2 = 2.25$, $p = 0.134$). Logistic regression showed that accounting for all other variables measured the odds of a satisfactory observation of delirium care in practice for the intervention group was 10.2 times higher than the control (OR = 10.2 95%CI[1.5–38.7], $p = 0.009$) (Table 2). Hospital site was found to be associated with performance results (OR = 14.1 95%CI[2.4–72.0], $p = 0.004$), with Site 3 having a lower rate of satisfactory adherence to best practice delirium care.

3.2. Survey data

A total of 45 participants completed both the pre (T0) and post (T1) survey, 20 of which were in the intervention group and 25 in the control group (Fig. 2).

3.3. Within-subject effects

The mean MCQ score and perceptions of confidence and competence in the intervention and control group increased from baseline to six-weeks post the intervention (Table 3).

3.4. Between-subject effects

There was no difference in mean MCQ scores between the intervention and control groups after the intervention (17.6 (1.2) v 17.5 (1.7), $t = 0.26$, $p = 0.793$) (Table 4). There was no difference in perceptions of confidence and competence in using the 4AT ($\chi^2 = 4.96$, $p = 0.084$ and $\chi^2 = 3.70$, $p = 0.157$, respectively) (Table 4). There was no difference in self-perceptions of confidence and competences in overall knowledge about delirium ($\chi^2 = 2.64$, $p = 0.268$ and $\chi^2 = 2.15$, $p = 0.342$, respectively) (Table 4). There was no association of age, years of experience, education level, and site on these outcomes.

4. Discussion

The DOE RCT study is the first published RCT comparing *The DOE Package* to standard professional development education for post-registration nurses in Australia. The results of the DOE RCT study demonstrated that participants in the intervention group had 10.1 times higher odds of achieving a satisfactory observations of delirium care in practice score than the control group. The intervention and control groups had significant 2. However, there were no differences between the groups.

Table 2
Logistic regression model for observations of delirium care in practice.

	Model 2		95 % CI
	OR	*p-value*	
Intervention	10.2	0.009	1.5–38.7
Site			
Site 2	14.4	0.004	2.4–72.0
Site 3	0.2	0.143	0.1–1.4
Male	4.0	0.226	0.5–29.8
Employment	4.6	0.077	0.7–11.4
Age	1.3	0.725	0.5–3.2
Position	0.9	0.46	0.4–1241.7
Years of Experience	1.1	0.193	0.9–1.2
Education Level	2.4	0.234	0.8–7.1

Table 3
Within-subject effects of the education on knowledge and self-perceptions of confidence and competence.

Group	Variable	Mean (SD) T0	Mean (SD) T1	Test Statistic	P value
Intervention (n = 20)	MCQ Score	15.3 (2.5)	17.6 (1.2)	t = −3.65	<0.001**
	I am confident in my ability to use the 4AT	2.9 (1.0)	4.3 (0.9)	χ^2 = 21.08	<0.001*
	I am confident in my overall knowledge about delirium	3.1 (1.0)	4.3 (0.5)	χ^2 = 19.64	0.001*
	I am competent in my ability to use the 4AT	3.3 (0.7)	4.2 (0.5)	χ^2 = 14.60	0.002*
	I am competent in my overall knowledge about delirium	3.4 (0.7)	4.2 (0.5)	χ^2 = 15.18	0.002*
Control (n = 25)	*MCQ Score*	14.4 (1.0)	17.5 (1.7)	t = −4.77	<0.001**
	I am confident in my ability to use the 4AT	2.8 (1.0)	4.2 (0.4)	χ^2 = 26.83	<0.001*
	I am confident in my overall knowledge about delirium	2.8 (1.0)	4.1 (0.5)	χ^2 = 21.26	<0.001*
	I am competent in my ability to use the 4AT	3.4 (0.7)	4.0 (0.3)	χ^2 = 11.52	0.009*
	I am competent in my overall knowledge about delirium	3.5 (0.7)	4.0 (0.4)	χ^2 = 11.43	0.010*

t = Paired t-Test, χ^2 = Chi-Squared.

Table 4
Between-subject effects of the education on knowledge and self-perceptions of confidence and competence.

Variable (T1)	Mean (SD) Intervention	Mean (SD) Control	Test Statistic	P value
MCQ Score	17.6 (1.2)	17.5 (1.7)	t = 0.26	0.793
I am confident in my ability to use the 4AT	4.3 (0.9)	4.2 (0.4)	χ^2 = 4.96	0.084
I am confident in my overall knowledge about delirium	4.3 (0.5)	4.1 (0.5)	χ^2 = 2.64	0.268
I am competent in my ability to use the 4AT	4.2 (0.5)	4.0 (0.3)	χ^2 = 3.70	0.157
I am competent in my overall knowledge about delirium	4.2 (0.5)	4.0 (0.4)	χ^2 = 2.15	0.342

t = Paired t-Test, χ^2 = Chi-Squared.

The transfer of learning is influenced by situational pressures and cultural barriers within an organisation that can ultimately block or enable the effectiveness of delirium educational intervention in the clinical setting (Lee et al., 2020). *The DOE* RCT study was undertaken at the same time the sites were introducing a policy for the Delirium Clinical Care Standard (Australian Commission on Safety and Quality in Health Care (ACSQHC), 2021). The introduction of the policy, the organisational focus to improve delirium care, and the hospital-wide delirium education likely had a positive impact on the intervention and control groups. This could e^{x}plain the increase in perceptions of confidence and competence, and delirium knowledge scores for both groups and the lack of statistical significance between the groups. Despite this, the odds of the intervention group having a satisfactory observation of delirium care in care score were significantly higher, indicating that *The DOE Package* is a more effective method of translating knowledge into clinical practice.

The findings from this study along with studies in previous clinical settings demonstrate the benefit of practicing delirium care, such as in an OSCE, and receiving feedback to reinforce and guide gold standard delirium care. A similar non-randomised comparison study evaluating a multicomponent education program in intensive care units (ICUs), using role-play, found that there was a statistically significant difference in delirium detection between ICUs based on the type of education received, with ICUs who received tele-delirium training having higher delirium detection rates (Sinvani et al., 2021). The tele-delirium training involved a remotely located geriatrician observing the ICU nurses perform a validated delirium assessment tool in real-time and providing feedback (Sinvani et al., 2021). The DOE RCT study contributes to the expanding knowledge base that delirium education is an effective method for enhancing delirium detection among healthcare practitioners. However, there are few RCTs that evaluate delirium educational interventions.

Interestingly, in the DOE RCT study, the site (Site 3) without access to a geriatrician was more likely to score lower in the observations of delirium care in practice. Sites 1 and 2 may have benefited from the presence of a specialised aged care team, who may have acted as role models in delirium care. There is emerging evidence of the benefits of delirium care role models or "delirium champions" (Cody et al., 2021; Fisher et al., 2017; Sinvani et al., 2021). Having a delirium champion in a ward could result in vicarious learning. Bandura's social learning theory proposes that learning acquired by experience could also be acquired through observation of other people's behaviour and its consequences (Bandura, 1977a). This is an important element in the development of self-efficacy (self-perceptions of confidence and competence). Self-efficacy plays a key role in how a person approaches goals, tasks, and challenges; those with high self-efficacy are more likely to view a challenging task as something to be mastered rather than avoided (Bandura, 1991; Bandura, 1977b). It is theorised that increased self-efficacy is positively related to clinical competence (Bahn, 2001; Bandura, 1977b; Burke and Mancuso, 2012). This suggests that delirium educational programs should also involve delirium champions to reinforce learning, assist in the development of delirium clinical competence, and encourage practice change.

A strength of the DOE RCT study is the robust design informed by the findings from a pilot study (Montgomery et al., 2024). This study used a methodology that included measuring education outcomes in terms of observed practice outcomes. The significance of this study is the demonstration of a practice change in delirium care following the OSCE based educational intervention. In addition, the DOE RCT was conducted across three acute hospital sites demonstrating feasibility and providing greater generalizability of the findings beyond aged care wards where research about delirium care is usually focused. Despite significant strengths, a study of this nature comes with methodological challenges. Retention of participants was challenging due to the shift work nature of the nursing workforce, limited protected education time, and unpredictable ward closures in the private health setting. It is suggested that future studies extend the observations of practice data collection period and to have flexible scheduling options for educational sessions to account for different shift patterns. Potential contamination cannot be ruled out that may have diluted the results of this study, with staff often being deployed to other wards around the hospital at each site. Future studies should be randomised by hospital not wards to reduce contamination. It is also possible that completing the observations of delirium care in practice 6-weeks after the completion of the educational intervention was not long enough to embed the learning gained from the intervention into clinical practice. Future studies are needed to evaluate the long-term sustainability of the outcomes of the intervention (>6 weeks) and if there is a positive impact on patient-level outcomes.

5. Conclusion

The DOE Package provides the foundation for facilitating change in delirium care. It is recommended that *The DOE Package* is implemented as part of a multicomponent strategy involving a validation delirium screening and assessment tool, hospital-specific policy, interprofessional education, and delirium champions. Future studies are needed to evaluate the sustainability of the intervention and if there is a positive impact on patient-level outcomes.

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CRediT authorship contribution statement

Amy Montgomery: Writing – original draft, Visualization, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Peter Smerdely:** Writing – review & editing, Visualization, Supervision, Methodology, Formal analysis, Conceptualization. **Louise Hickman:** Writing – review & editing, Writing – original draft, Visualization, Supervision. **Victoria Traynor:** Writing – review & editing, Visualization, Supervision, Methodology, Funding acquisition.

Declaration of competing interest

No conflicts to declare.

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Ethics statements

Human Research Ethics approval for the conduct of this trial was gained from the University of Wollongong Health and Medical Human Research Ethics Committee (HREC) prior to commencing recruitment and data collection (Approval No 2014/339). Written informed consent was obtained from individuals for observations of practice and individual implied consent for surveys. As the education was conducted as part of usual professional development, implicit consent was used as those who chose not to participate in the research could choose to still participate in the intervention.

The study protocol was prospectively registered through the Australian New Zealand Clinical Trials Registry (ANZCTR). Trial registration number: ACTRN12619000893101, 26 June 2019. Protocol Version 1. https://www.anzctr.org.au/Trial/Registration/TrialReview.aspx?id=377284&isReview=true

All authors have approved the final version to be published. All authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.nedt.2024.106211.

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