

## RESEARCH ARTICLE

# Teaching delirium to undergraduate medical students: Exploring the effects of a cross-professional group objective structured clinical examination compared to standard education

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## Abstract

**Objectives:** To compare a cross-professional facilitated delirium group objective structured clinical examination (GOSCE) educational intervention with standard delirium education for medical students during clinical placement, and explore the differences in the examiner's written feedback between the two groups.

**Methods:** A non-randomised clustered controlled designed study at a single metropolitan university across several campuses in Sydney, Australia. A convenience sample of third-year medical students was recruited. Students' knowledge, communication, and clinical reasoning skills were assessed using a delirium case mock OSCE at the end of the academic year. The OSCE marks and the examiner's feedback for the intervention and control group were compared.

**Results:** The intervention group ( $n = 41$ ) had a higher total mean OSCE mark compared to the control group ( $n = 29$ ) (36.5, SD 2.9 vs. 33.7, SD 2.9,  $p < 0.001$ ). Content analysis of the examiner's feedback showed the intervention group had a greater understanding of the need for forward planning and future cognitive assessments, and the roles of the interdisciplinary team in delirium care.

**Conclusions:** The innovative cross-professional facilitated delirium GOSCE education was effective in increasing delirium knowledge, communication, and clinical reasoning skills compared to conventional education for medical students during clinical placement. Further studies are needed to investigate how this is translated into practice.

## KEYWORDS

clinical skills, delirium, medical students, simulation training, undergraduate medical education

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## 1 | INTRODUCTION

Due to the high prevalence of delirium in hospitalised older people, it is essential that delirium care education becomes a core component of all undergraduate medical curricula. Delirium diagnosis and management is complex,<sup>1</sup> and clinical placements do not guarantee that all students will observe a delirium diagnosis or gold-standard delirium management.<sup>1,2</sup> Medical students often find interacting with people experiencing delirium challenging and stressful, and might avoid such interactions during their clinical placements.<sup>1</sup> International experts recently called for a framework of delirium content to be imbedded into undergraduate medical curricula.<sup>3</sup> This framework moves away from traditional teaching (i.e., lectures) about delirium and calls for interactive modes of learning and teaching such as case-based discussions, simulation, interdisciplinary workshops, and cross-professional education.<sup>3</sup>

A systematic review found that delirium educational interventions are most effective when learning is interactive and contains enabling and reinforcing factors.<sup>4</sup> Effective delirium education should promote ownership, challenge attitudes, improve behaviour and communication skills, and increase the recognition of the emotional effect of delirium.<sup>1,3,5</sup> There are very few studies evaluating delirium education for medical students, particularly in regard to the effects of simulation.<sup>4,6–8</sup> Simulation exposes students to the complexity, challenges, and uncertainty of delirium care in a formative, safe, and controlled environment.<sup>9</sup> Simulation is designed to increase self-efficacy and learning in the hope that medical students will seek out people experiencing delirium during their clinical placements.<sup>10</sup>

The simulation method using objective structured clinical examinations (OSCEs) was found to be valuable as an educational intervention for medical students during clinical placement.<sup>11,12</sup> One variation of the original OSCE format is the group GOSCEs.<sup>13–17</sup> The GOSCEs were first developed in 1991 as a formative self-assessment and learning intervention for general practitioners.<sup>13</sup> The GOSCEs were designed to promote self-reflection, self-assessment, and learning, rather than to examine the clinical skills of medical students.<sup>13</sup> There are few research studies evaluating the effects of formative GOSCEs on the learning of medical students. In a feasibility study (results not published), we found that a cross-professional facilitated delirium GOSCE education program during clinical placement had a significant impact on self-efficacy for medical students.

### Practice Impact

The findings from this study suggest that the GOSCE education intervention has the potential to overcome the opportunistic nature of clinical placement learning about delirium and increase delirium clinical competency for medical students.

However, it is not known if the delirium GOSCE education program is superior to standard delirium education.

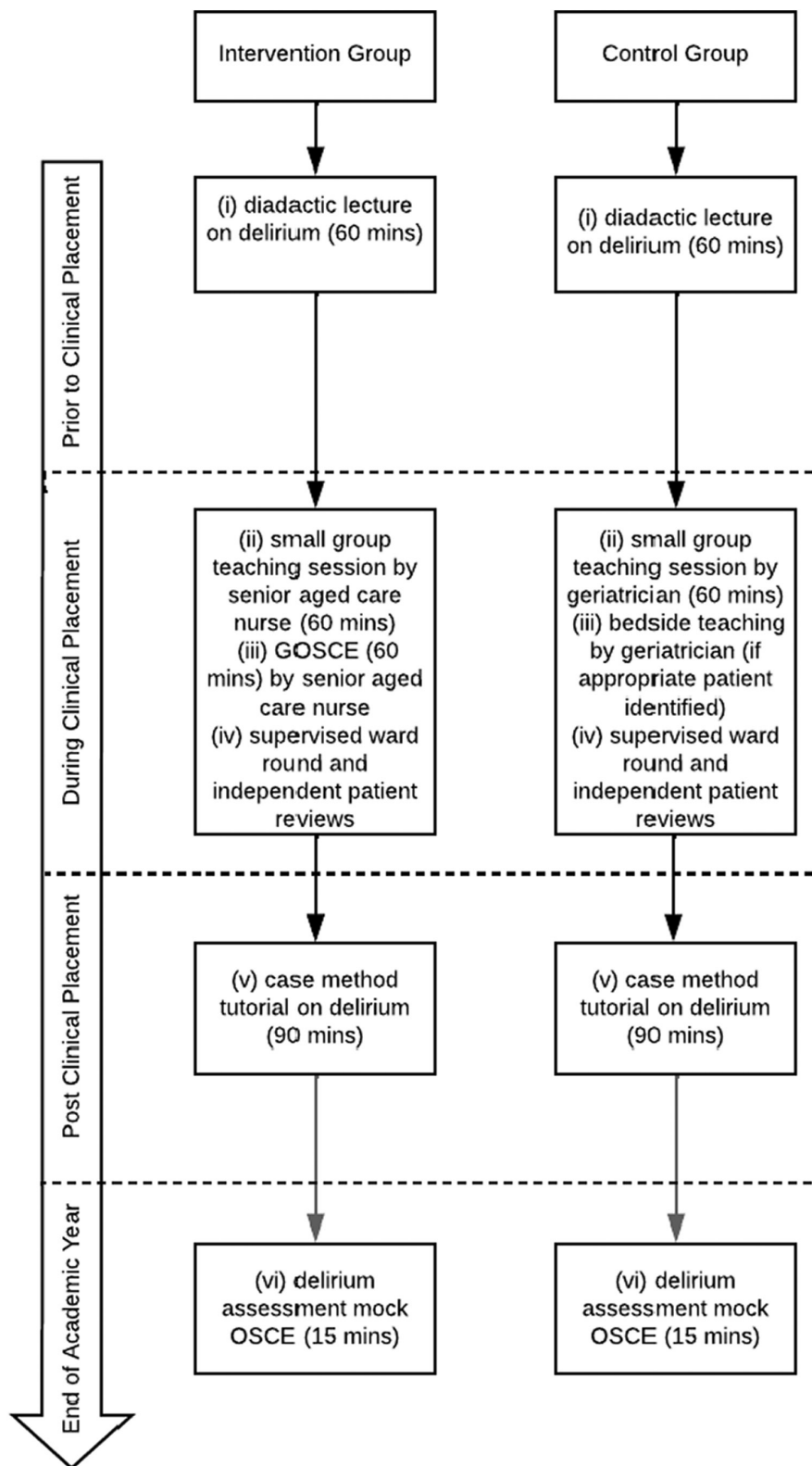
### 1.1 | Aims

To compare a cross-professional facilitated delirium GOSCE education intervention to standard delirium education for medical students during clinical placement. It was hypothesised that participants who received the intervention would demonstrate higher levels of delirium knowledge, communication, and clinical reasoning skills in their delirium case mock OSCE score than those in the control group. We also aimed to explore the differences in the examiner's written feedback between the two groups.

## 2 | METHODS

This study used a non-randomised clustered controlled design. The study was conducted at a single metropolitan university in Sydney, Australia. The medical school consists of six metropolitan clinical schools with a total of 228 student enrolments per year. The students within these clinical schools have similar academic performance, and are considered to be comparable.

The students undertake geriatric medicine learning within the third year of the 6-year undergraduate degree. The students attend a mandatory 4-week clinical placement in clinical schools based at teaching hospitals. The 4-week clinical placement is repeated four times over the academic year for different groups of students. A convenience sample of third-year medical students at two clinical medical schools was recruited into the intervention group and two clinical schools were recruited into the control group, based on their willingness to participate. Students were eligible to participate if they were a third-year medical student during the 2019 academic year and were attending one of the four



**FIGURE 1** Participant timeline. GOSCE, group objective structured clinical examination; OSCE, objective structured clinical examination

participating clinical schools. All eligible students (control group  $n = 73$  and intervention group  $n = 66$ ) were invited via email to participate in a delirium case mock OSCE in

the week prior to the end-of-year clinical OSCE exam in November 2019 (Figure 1). While students were expected to attend the intervention, they could opt out.

## 2.1 | Standard delirium education

The standard delirium education for the control group consisted of five parts leading up to the delirium assessment mock OSCE.

- (i) Didactic lecture on delirium (60 min) occurred prior to their 4-week aged care clinical placement. All students were expected to attend, or access a video recording, of the lecture by a geriatrician.
- (ii) During their aged care clinical placement, the students participated in a small group teaching session by a geriatrician (60 min).
- (iii) Bedside delirium teaching, led by a geriatrician, also occurred if appropriate patients were identified (Figure 2). Bedside delirium teaching was not guaranteed and the learning experience was not standardised across clinical schools.
- (iv) Students participated in supervised ward rounds and were provided with opportunities to undertake independent patient reviews.
- (v) Case method tutorial on delirium (90 min) occurred following clinical placement. Students from all the sites came together on campus and were required to discuss a case study of a person with delirium,

sharing their knowledge and clinical experience of delirium acquired during their clinical placement. The case method tutorial was the only mandatory educational component.

Education components (i), (iv), and (v) were the same for both control and intervention group; components (ii) and (iii) differed for the intervention group. Figure 1 shows the timeline and comparison of the education for both groups.

## 2.2 | Intervention group

For the intervention group, parts (ii) and (iii) consisted of the following during the 4-week aged care clinical placement (Figure 2).

- (ii) Small group teaching session (8–12 students) facilitated by senior aged care nurses with expertise in delirium (total 60 min).
- (iii) The GOSCE (total 60 min) facilitated by senior aged care nurses. The GOSCE was designed to provide formative feedback from the facilitator, peers, and the standardised patient (SP) on delirium knowledge, communication, and clinical reasoning skills.

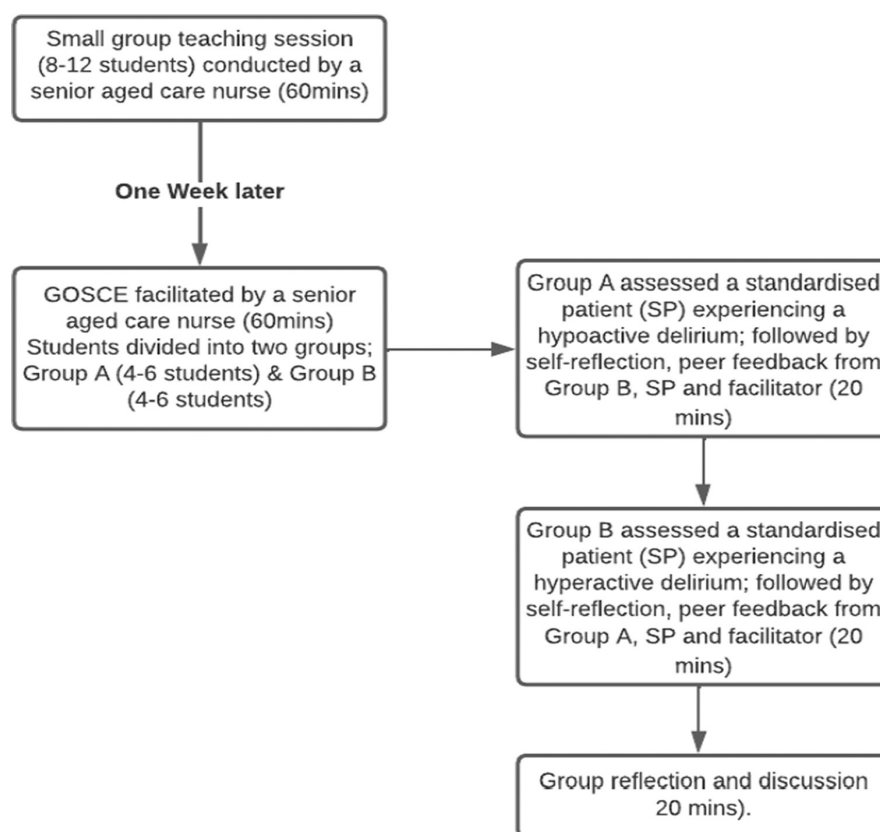


FIGURE 2 Intervention group (Medical student delirium GOSCE intervention). GOSCE, group objective structured clinical examination; SP, standardised patient

The GOSCE consisted of two stations that focused on delirium assessment.

1. Hyperactive delirium: a 69-year-old male, day three postgamma nail insertion for a fractured left hip sustained following a fall from a ladder;
2. Hypoactive delirium: a 90-year-old female admitted to hospital from a residential aged care facility with drowsiness and fever.

For the GOCSE, students were divided into two groups, consisting of four to six students. Each group participated in one station. The group not participating in the station was required to observe and provide peer feedback following the station. Prior to the beginning of the GOSCE, the students received an orientation to the structure of the GOSCE and instruction on giving feedback. Students had time before starting the station to discuss a strategy for the delirium assessment (5 min). Students were allowed 15 min to undertake the delirium screen, head to toe clinical assessment, and to discuss the potential causes of the delirium.

The intervention was developed by a geriatrician and aged care nurse practitioner and was mapped against recommendations set out in the international undergraduate medical curriculum for delirium (Appendix S1).<sup>3</sup> The SP was role played by nurses experienced in delirium. The SPs were instructed to purposefully create a challenging situation for medical students to stimulate a facilitated discussion around communication, attitudes, and good practice. The SPs were instructed to respond positively to effective communication and reassurance from students. The purpose of this was to focus on improving communication skills, and to increase understanding of the emotional effect of delirium.<sup>1,5</sup>

## 2.3 | Delirium case mock OSCE

Participants in the intervention and control group were compared using a delirium case mock OSCE. An OSCE was chosen as the mock exam format because all students were familiar with the structure of OSCEs and OSCEs are used to assess student competency in knowledge, communication, and clinical reasoning skills.<sup>18</sup> The OSCE was written by a geriatrician, who was both a clinician and teaching academic, using the medical school's standard marking rubric for the end-of-year clinical exam for the third-year medical students. The delirium case mock OSCE was peer reviewed by the medical school's clinical examination committee.

The OSCE scenario consisted of asking students to interview a distressed family member of an older person experiencing a delirium. The family member was role-played by a healthcare professional experienced in delirium. The students were required to elicit a medical history of the

older person and explain various aspects of delirium to the family member to demonstrate their delirium knowledge, communication, and clinical reasoning skills.

## 2.4 | Data collection

The delirium assessment mock OSCE was marked using the medical school's standard marking rubric which has five domains (Appendix S2).

1. Communication: engaging, empathising with, and listening to a distressed family member of an older person with delirium.
2. Delirium history: knowing what history is typical of delirium, and exploring possible causes.
3. Psychosocial impact of delirium: knowing possible impacts of delirium on the older persons' function and social situation.
4. Clinical reasoning and delirium diagnostic skills: tested the ability to summarise complex history and synthesise to the examiner.
5. Explaining in non-medical language the diagnosis, and educating the family member about delirium and how it is different to dementia: tested knowledge, communication, and clinical reasoning skills.

The examiner was the geriatrician who wrote the mock OSCE. Each domain was marked out of nine. Students who achieved a mark of nine in all five domains, had their total mark converted to 50, as per the standard practice of the medical school. Higher marks indicate greater delirium knowledge, communication, and clinical reasoning skills. A total mark was recorded for each participant. Students' marks were also converted into fail, pass, credit, distinction, and high distinction grading. The examiner provided handwritten feedback to the students to highlight areas of strengths and areas for improvement. The students' clinical school and student identification number were recorded on the OSCE marking rubric. No other demographic data of participants were collected. Human Research Ethics approval was gained from the Human Research Ethics Committee of University of Wollongong and the University of New South Wales (2019/ETH03736) prior to commencing recruitment and data collection. Written informed consent was obtained from individuals for the delirium case mock OSCE.

### 2.4.1 | Blinding

The study adopted a single-blind design. The examiner undertaking the delirium case mock OSCE was blinded to the group assignment of each clinical medical school and



the students to either the intervention or control group. Further blinding was not feasible given the nature of the intervention.

## 2.4.2 | Data analysis

The quantitative data were analysed using IBM SPSS statistics for Windows, Version 27.0.<sup>19</sup> A total mark was calculated for each student. Data were determined to be normally distributed. The total mark of students who had previously completed the GOCSE intervention and those who had not were compared using independent samples *t*-test. We conducted a post-hoc analysis that determined that a total number of 70 students would provide >95% power to detect an effect size >0.8 for the difference in OSCE scores between groups. All analyses are reported at the 0.05 significance level. All results are presented as mean  $\pm$  SD unless otherwise indicated. The categorical data of grade descriptors were explored through descriptive statistics.

All of the examiner's handwritten feedback was transcribed into a Microsoft Excel spreadsheet (version 2201). Conventional content analysis using an inductive approach as described by Hsieh and Shannon<sup>20</sup> was conducted by the first author to explore the differences in the handwritten feedback between the intervention and control group by the blinded assessor. The first author read and re-read the data to immerse and familiarize herself with the depth of the data, and to ascertain and identify common language and meaning. The focus was on understanding how the examiner's words were used to provide feedback to the student on their performance. Exact words were highlighted from the text that appear to capture key concepts and allowed for the creation of codes and themes.

## 3 | RESULTS

A total of 70 third-year medical students completed the delirium assessment case mock OSCE. The intervention group consisted of 41 (response rate 56%) students. The control group consisted of 29 (response rate 44%) students. The mean time duration between the completion of the delirium education and the mock OSCE exam for the intervention and control group was 14 weeks (range 1 to 27 weeks, SD 12.1).

### 3.1 | Delirium case mock OSCE mark

The intervention group had a higher total mean OSCE mark compared to the control group ( $36.5 \pm 2.9$  vs.

**TABLE 1** Allocated mock objective structured clinical examination exam grade

Allocated grade	Intervention group % (n)	Control group % (n)
Fail (<50%)	0 (0)	0 (0)
Pass (50%–64%)	7 (3)	24 (7)
Credit (65%–74%)	63 (26)	65 (19)
Distinction (75%–84%)	27 (11)	10 (3)
High distinction (85%–100%)	2 (1)	0 (0)

$33.8 \pm 2.9$ ,  $p < 0.001$ ). Between the two cohorts, none of the students received a fail grade (<50%) (Table 1). A total of 29% ( $n = 12$ ) of students in the intervention group received a distinction grade or higher (75%–100%) compared to 10% ( $n = 3$ ) in the control group.

## 3.2 | Content analysis

Content analysis of the examiner's comments generated three themes: (1) Follow up and Forward Planning, (2) Team Approach, and (3) Family and Carer Support.

### 3.2.1 | Follow up and forward planning

A total of 54% ( $n = 22$ ) students in the intervention group discussed support on discharge (i.e., services), follow-up, and/or future assessment of cognition, compared to 3% ( $n = 1$ ) in the control group. In the intervention group, the discussion of follow-up and/or future assessment of cognition stem from their awareness of the risk of delirium recurrence (15%,  $n = 6$ ) and delirium being a risk factor for dementia (19%,  $n = 8$ ). For example:

Described delirium as a risk factor for dementia. Discussed option for support and [home service assessment], arranged for follow up.

(examiner's comments for participant 6, intervention group)

### 3.2.2 | Team approach

A total of 32% ( $n = 13$ ) students in the intervention group discussed the role of the interdisciplinary team ('social worker', 'occupational therapist') and/or the family in caring and supporting the older person with delirium, compared to 3% ( $n = 1$ ) in the control group. For example:

[Discussed] we are here to help- we have social workers and people who can support her.  
(examiner's comments for participant 4, intervention group)

Talked about how relative can help - family member present, orientation, clock, calendar etc.  
(examiner's comments for participant 33, intervention group)

### 3.2.3 | Carer support

Compared with the control group (72%,  $n = 21$ ), the students in the intervention group provided greater reassurance, emotion support, and education to the distressed family member (80%,  $n = 33$ ). For example:

Lots of empathy, constantly reassured.  
[Asked] how are you coping and how are you holding up?... Checked on understanding of delirium.  
(examiner's comments for participant 21, intervention group)

Acknowledged distress, checked in multiple times about this distress when taking history. Very empathetic and reassuring. Described delirium symptoms well [to daughter].  
(examiner's comments for participant 10, control group)

The control groups were more likely to explain delirium to the family member using medical jargon (34%,  $n = 10$ ) compared to the intervention group (7%,  $n = 3$ ). For example:

Practice use of non-medical terminology when describing delirium, the knowledge there, but you had trouble describing it to the daughter.  
(examiner's feedback for participant 2, control group)

## 4 | DISCUSSION

The results of this study show that students who participated in the cross-professional facilitated delirium GOSCE intervention demonstrated superior knowledge, communication, and clinical reasoning skills in the mock OSCE compared to students who had the standard delirium education during clinical placement. This suggests that the GOSCE

intervention has the potential to overcome the opportunistic nature of clinical placement learning about delirium and increase delirium clinical competency for medical students.<sup>1,3</sup>

In addition to a higher OSCE mark, students in the intervention group demonstrated a greater understanding of the need for forward planning and future cognitive assessments and the roles of the interdisciplinary team in delirium care. This finding may be due to the cross-professional teaching and standardised structure using the GOSCE format. Delirium experts recommend cross-professional teaching of delirium,<sup>1-3</sup> and to the best of our knowledge we are the first study to evaluate the effects of incorporating cross-professional teaching into delirium education for medical students.<sup>21-24</sup>

We demonstrated that the intervention group were more likely to provide information to the family member using non-medical jargon. Our results are similar to those of Sutin and colleagues<sup>11</sup> who demonstrated that medical students who participated in a geriatric teaching OSCE during clinical placement scored higher in the communication and information-gathering component of the geriatric station in their end-of-year clinical skills examination. Our study also had similar findings to a study comparing simulation to standard medical education on delirium knowledge.<sup>6</sup> Fisher and colleagues<sup>6</sup> demonstrated a significant improvement in delirium knowledge for medical students following a 45-min delirium simulation compared to a control group. However, they did not evaluate the effect of the simulation on clinical reasoning skills. None of these studies tested the effects of cross-professional facilitated education about delirium for medical students.

A limitation to this study is the lack of baseline data. It is not known if students in the intervention group had a higher level of delirium knowledge and clinical reasoning skills prior to the GOSCE intervention. We did not ask students about their interactions with the interdisciplinary team members during their clinical placement. It is not known if students in the intervention group had greater interaction with members of the interdisciplinary team contributing to their heightened awareness about the importance of a team approach in delirium care. Besides student's clinical school and student identification number, no further demographic data were collected, thus we were unable to determine homogeneity of variance. In addition, there is a risk of bias with the examining geriatrician of the delirium case mock OSCE being an author of this study. We attempted to reduce this bias by blinding the examining geriatrician.

To the best of our knowledge, this is the first study comparing a delirium GOSCE intervention during clinical placement to a control group. Separating the intervention group and control group by clinical school reduced the possibility of contamination. Previous studies evaluating the

effect of a GOSCE intervention during clinical placement measured student reports of self-efficacy.<sup>15,17</sup> However, it is argued that self-efficacy does not always equate to clinical competency.<sup>25</sup>

We had one examiner assess all participants to reduce the likelihood of variation in assessment method. However, further research is needed to determine the long-term retention of delirium knowledge and skills, and the translation into clinical practice.

## 5 | CONCLUSIONS

The innovative cross-professional facilitated delirium GOSCE education is an effective method to increase delirium knowledge, communication, and clinical skills compared to conventional education for medical students during clinical placement. This study provides evidence to encourage the future use of GOSCEs during clinical placements for medical students. Further studies are needed to investigate the long-term retention of delirium care education and how this translates into practice.

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## CONFLICTS OF INTEREST

No conflicts of interest declared.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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