



Articles

Delirium Knowledge and Screening Practices in Postoperative Cardiac Surgery: A Quality Improvement Project

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Delirium

Background

Postoperative delirium (POD) is common yet often underrecognized in older adults undergoing cardiac surgery. Staff education is essential for evidence-based delirium care in the postoperative setting.

Objective

To implement and evaluate a delirium education program for nursing staff in a postoperative cardiac surgery setting.

Methods

This uncontrolled before-and-after quality improvement project implemented structured delirium education for nursing staff at an 80-bed cardiac specialty hospital during competency updates, team meetings, and a lunch-and-learn session. Educational content included didactic learning, case studies, one-on-one demonstrations of validated delirium assessments, and integration of delirium as a quality metric into daily leadership rounds. Outcomes included pre- and post-intervention Nurses' Delirium Knowledge Assessment (NDKA), delirium screening documentation frequency, and timing of geriatric consultation.

Results

Participants' knowledge of delirium improved following education. The mean NDKA score increased from 20.53 (SD = 2.53) to 22.65 (SD = 1.93), $t(16) = -3.65$, $p = .002$, with a large effect size ($d = 0.884$). Following education, the mean delirium assessment documentation completion rate for day shift increased from 46% to 56%, $t(89) = 2.05$, $p = .044$, $d = 0.43$. The mean postoperative day of geriatric consultation decreased from 4.20 to 2.33 days; however, this difference was not statistically significant ($d = 0.81$; $n = 16$).

Conclusion

Education improved nurses' knowledge and delirium screening documentation. A nonsignificant trend toward earlier geriatric consultation was observed, though limited by sample size. These findings support the role of structured delirium education in promoting evidence-based postoperative delirium care.

INTRODUCTION

Hospital-associated delirium is widely prevalent, and risk of postoperative delirium (POD) following cardiac surgery is compounded by cardiopulmonary bypass, advanced age, underlying cognitive impairment, medications, and other acute and chronic conditions.¹ Occurring in up to 50% of adults over age 65 years, POD is the most common complication following cardiac surgery.² The American Geriatrics Society³ states that up to 40% of delirium cases are

preventable, indicating substantial opportunity for practice change.

The *Clinical Practice Guideline for Postoperative Delirium in Older Adults* by the AGS³ states its first recommendation as standardized delirium education that focuses on teaching nurses and other staff to recognize delirium, understand risk factors, and appropriately utilize screening tools. Despite this recommendation, a local 80-bed cardiac specialty hospital had not added POD to standardized education for nursing staff, revealing an evidence-to-practice gap.

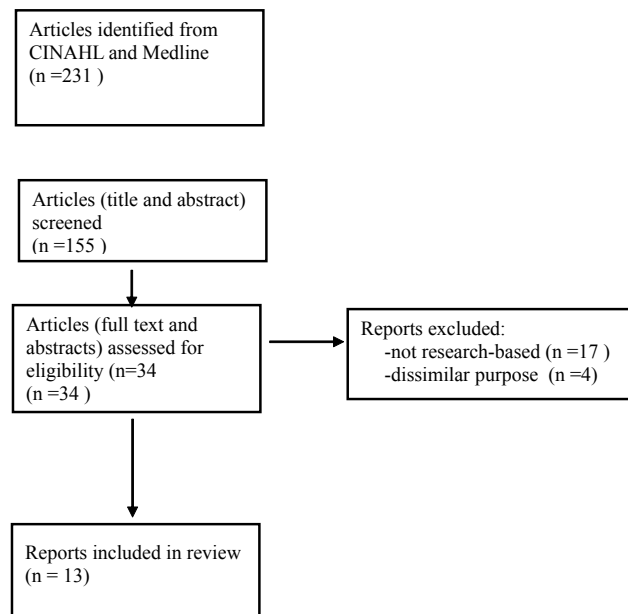


Figure 1. Literature Review Search Selection

Observations from the cardiac specialty hospital align with evidence demonstrating that many nurses have limited knowledge of delirium incidence, risk factors, and screening tools.⁴⁻⁶ Chart audits indicated that delirium screening documentation was underutilized.

LITERATURE REVIEW

A structured literature review of CINAHL and MEDLINE was conducted to identify recent studies examining delirium education for nursing staff in adult acute care settings (see [Figure 1](#)). Searches were limited to full-text, peer-reviewed, English-language articles published between 2018 and 2024. Search terms included delirium and education, delirium and training, and delirium and learning. Delirium education in settings other than the adult acute care setting, such as pediatrics, emergency departments, extended care facilities, hospice, and palliative care were excluded. Studies with patients, families, or healthcare students as the learner were also excluded. Articles were initially screened by title and abstract for relevance, followed by full-text review based on inclusion and exclusion criteria. Thirteen studies were included in the final synthesis (see [Table 1](#)).

The literature demonstrates that education improves nurses' knowledge and screening of delirium and promotes appropriate delirium management.⁷⁻¹⁶ Studies also link education to increased use of nonpharmacologic strategies, earlier provider notification, and reduced use of potentially inappropriate medications.^{8,16} Knowledge of delirium alone is insufficient to change patient outcomes¹⁷; these findings emphasize the importance of combining staff education with broader systems-level approaches to delirium care.

The literature review was limited to evidence primarily from quasi-experimental and quality improvement pro-

jects, and none involved staff education in the cardiac surgery setting. This project aimed to bridge that gap by evaluating a delirium education intervention for nursing staff in the postoperative cardiac surgery setting.

PROJECT PURPOSE

This project's purpose was to develop an educational program for nursing staff that aligns with the AGS *Clinical Practice Guideline for Postoperative Delirium in Older Adults*.³

OUTCOMES

The anticipated outcomes of the project were three-fold. The first outcome was enhancement of nurses' knowledge of POD, as measured by the Nurses' Delirium Knowledge Assessment (NDKA¹⁸). The second outcome was improvement in nursing documentation of validated delirium assessments. The third outcome was evaluation of the timing of geriatric consultation as a potential indicator of interdisciplinary response to delirium.

METHODS

This uncontrolled before-and-after quality improvement project was conducted between December 2024 and April 2025 and is reported using the Standards for Quality Improvement Reporting Excellence (SQUIRE 2.0) guidelines.¹⁹

CONTEXT

The site for implementation was an 80-bed cardiac specialty hospital and the postoperative cardiac surgery patient population. The target participants for delirium education included approximately 200 critical care and

Table 1. Evidence Table for Literature Review

Study	Purpose Statement	Sample/ Setting	Level of Evidence	Type/ Design	Findings and Themes Identified
Aldawood, Z. S., Alameri, R. A., Elghoneimy, Y., Swyan, A. H. A., Almulla, H., Hammad, S. S., Saleh, N. S. A., & Alameri, S. A. (2023)	To assess critical care nurse's knowledge of ICU delirium and the effectiveness of an educational program (didactic PowerPoint) on critical care nurse's knowledge regarding recognition and assessment of ICU delirium.	Sample size determined by statistical testing to be 57 nurses in the setting of one 28-bed ICU in Saudi Arabia. Only Registered Nurses (RNs) working in medical intensive care unit (MICU), surgical intensive care unit (SICU) and coronary care unit (CCU) for more than six months were included.	Level IV	Quasi-experi-mental Pre-test post-test design	A modified delirium knowledge assessment scale (NDKA; Hare 2008) was used for measurement. Post-test, over 92% of nurses correctly answered assessment for the altered level of patient consciousness compared to 68.4% in pre-test. Over 90% of nurses correctly answered questions related to delirium occurrence post-test compared to 22 % in pretest. Nurses' knowledge related to risk factors did not improve after the educational program. Theme: Improved knowledge and recognition of delirium after education. Nurses changed their delirium management by decreasing stimulation and increasing patient re-orientation.
Alhalaiqa, F., Masa'Deh, R., Al Omari, O., Shawashreh, A., Khalifeh, A. H., & Gray, R. (2023)	To determine the impact of a didactic education program on nurses' knowledge, practice, attitudes, self-efficacy, and ability to detect delirium among Intensive Care Unit (ICU) patients.	Convenience sampling of ICU RNs from six different hospitals. The intervention group received six hours of delirium teaching over two days. A questionnaire was used to evaluate nurses' knowledge of delirium pre and post intervention.	Level IV	Non-equivalent Quasi-experimental	Attending the delirium education program improved nurses' knowledge and practice. Nurses in the intervention group detected 28% of patient cases of delirium; in the control group, nurses detected 6.5 % of delirium cases. Theme: After education, improved knowledge and recognition of delirium in nurses.
Blevins, C. S., & DeGennaro, R. (2018)	To evaluate the effectiveness of a multimodal educational intervention for nurses in the medical ICU to improve their knowledge and skills regarding delirium and delirium recognition.	Convenience sample of 34 nurses from a 28-bed medical ICU in an academic medical center participated in education which included a video vignettes, case studies, didactic content, (including review of CAM-ICU), and bedside instruction/ return demonstration of CAM-ICU delirium screening.	Level IV	A quasi-experimental pre- and post-intervention assessment design	A version of the NDKA (Hare, 2008) was used before and after intervention. The multimodal educational intervention improved nurses' knowledge about delirium. Ongoing delirium education is necessary to sustain accurate delirium identification. Knowledge of screening tools and knowledge of risks of delirium were not affected by the educational intervention. Themes: 1. Scenario-based education is supported by research. 2. Multi-modal education is effective. 3. Improved knowledge of delirium in nurses after intervention. 4. Education must be ongoing.
Detroyer, E., Dobbels, F., Teodorczuk, A., Deschodt, M., Depaifve, Y., Joosten, E., & Milisen, K. (2018)	To determine the effect of a nursing e-learning tool for delirium regarding: in-hospital prevalence, duration and severity of delirium or mortality in hospitalized geriatric patients, and geriatric nurses' knowledge and recognition regarding delirium.	Sample of 81 patients pre-intervention and 79 patients post-intervention. Intervention performed with 17 nurses of one geriatric in a university hospital	Level IV	Before-after study (sequential design)	Research showed no impact of the delirium e-learning tool on the in-hospital prevalence, duration and severity of delirium or mortality in patients or on nurses' knowledge about delirium (using the Delirium Knowledge Questionnaire) or on their ability to recognize delirium using case vignettes. Theme: This study's results were incongruent with the theme of nurses' increased knowledge of delirium after education.
Ewens, B., Seaman, K., Whitehead, L., Towell-Barnard, A., & Young, M. (2021).	To evaluate the level of delirium knowledge in clinicians caring for patients at high risk of developing delirium and to determine whether education can improve clinical assessment of delirium.	A convenience sample of clinical staff across 12 patient care units at a 722- bed hospital in Western Australia. 246 patient records prior to and 149 records after educational intervention were audited for delirium.	Level VI	Use of survey and chart audit	The audit found that use of a cognitive assessment tool overall increased from 8.5% before education to 43%. 159 staff completed the Delirium Knowledge Questionnaire (118 before and 41 after education). The most significant increase in knowledge was related to risk factors of delirium. Theme: Education increases detection of delirium.
Grealish, L., Jo-Anne, T., Krug, M., & Teodorczuk, A. (2019)	To investigate the impact of an educational program on nurses' knowledge about delirium prevention. Focus of the education was on the "knowing, meaning, and doing" related to delirium.	Survey of 42 nurses on one 24- bed hospital unit at a tertiary medical center over four time points. Education included 3 parts: online modules (knowing), discussion (meaning), and simulation (doing).	Level IV	Repeated cross-sectional survey, over four time points: before two time points during, and three months after education.	Correct responses on the Delirium Knowledge Questionnaire increased over time from 74.5% before to 86.4% after education. Theme: Scenario-based education and multi-modal education is effective. Increased knowledge and detection of delirium in nurses after education.
Jahanbazi, A., Jokar, F., & Kheirollahi, N. (2022)	To determine the effect of Scenario-Based Learning (SBL) on the performance of nurses in the management of delirium in	Convenience sampling of 32 nurses from one CICU.	Level IV	Quasi-experimental, pre-post-test design	SBL improved the delirium care performance levels of nurses in the cardiac surgery ICU. Nurses' knowledge/performance decreased after 3 weeks but remained higher than prior to SBL. Theme: Scenario-based education is effective. Improved knowledge of delirium

Study	Purpose Statement	Sample/ Setting	Level of Evidence	Type/ Design	Findings and Themes Identified
	Cardiovascular Intensive Care Units (CICUs).				after education (using the Delirium Knowledge Questionnaire). Improved performance was also achieved (early recognition not separated from other performance outcomes). Screening tools should be standardized, and education should be ongoing.
Montgomery, A., Smerdely, P., Hickman, L., & Traynor, V. (2024)	To determine if The Delirium OSCE Education Package is superior to standard methods of nurse delirium education.	Convenience sample of 190 nurses or student nurses from medical or surgical units from three hospitals in Australia.	Randomized control trial	A total of 51.3 % in the intervention group obtained a satisfactory observation of delirium care in practice score, compared to 34.9 % in the control group. The odds of a satisfactory observation of delirium care in practice score for the intervention group was 10.1 times higher than the control. Theme: Standardized tools for delirium education should be utilized.	Evaluate the impact of delirium education on nursing care.
Kim, Y.-N., & Kim, D.-H. (2021)	To examine the effects of case-based confusion assessment methods for ICU education on delirium knowledge and assessment accuracy for ICU nurses.	Convenience sample of 122 nurses (61 participants in each group) working in the intensive care unit of one university hospital in South Korea.	Level IV	Pre- and post-test non-equivalent case-control design	The case-based confusion assessment methods the educational program was effective for improving delirium knowledge (using the survey by Lee, 2007) and delirium assessment accuracy in ICU nurses. Theme: Scenario-based education is effective. After education, nurses' knowledge and recognition of delirium improved.
Ormonde, C., Igwe, E. O., Nealon, J., O'Shaughnessy, P., & Traynor, V. (2023)	To evaluate if delirium education for registered nurses working in post-anesthetics care units (PACU) impacts their self-reported confidence and competence in recognizing and managing delirium.	Snowball technique for RN recruitment via four professional organizations and three hospitals. 336 respondents were divided into three groups based on their level of delirium education.	Level VI	Quantitative use of a survey (descriptive design)	Quantity of prior delirium education did not improve the confidence, competence, knowledge, or case scenario responses of PACU RNs. Delirium education should undergo evaluation to ensure that education results in improved practice in the care of patients with delirium. Theme: Delirium education should be based upon methods and resources supported by research (standardized).
Sinvani, L., Delle Site, C., Laumenede, T., Patel, V., Ardito, S., Ilyas, A., Hertz, C., Wolf-Klein, G., Pekmezaris, R., Hajizadeh, N., & Thomas, L. (2021)	To evaluate a multi-component education model to improve delirium detection in a large healthcare system.	Fourteen ICUs across nine hospitals participated in a multicomponent delirium program consisting of a 1-day workshop that included: patient testimonials, discussions, didactics, and role-playing. Four ICUs received delirium training via telehealth.	Level VI	Quality improvement intervention	Post-training delirium detection was 5.4% in ICUs that did not participate in the training; 21.2% in ICUs that participated in the 1-day workshop; and 30.1% in ICUs that participated in the 1-day workshop plus tele-delirium training as measured by CAM-ICU. Theme multi-modal education is effective.
Solberg, L. M., Campbell, C. S., Jones, K., Vaughn, I., Suryadevara, U., Fernandez, C., & Shorr, R. (2021)	To evaluate the effectiveness of an education program to improve nurses' recognition and attitudes towards patients experiencing delirium.	389 health professionals participated in the 3-step educational program: self-directed online module, dementia simulation experience, and a multi-station delirium skills fair.	Level VI	Descriptive design; quality improvement	Statistically significant differences in pre- and post-testing suggested increased understanding of the experience and abilities of people experiencing cognitive impairment (self-reported). The four-month follow-up survey showed a continued understanding of the importance of recognizing, documenting, and treating delirium. Theme: Education improves nurses' knowledge of delirium.
Travers, C., Henderson, A., Graham, F., & Beattie, E. (2018)	To evaluate the impact of a social education approach to improving both nurses' knowledge of and screening for delirium.	34 nurses from 6 hospital units became "Cognitive Champions" to lead their units in a social education process about cognitive impairment and assessment of delirium. 148 unit nurses attended a delirium education along with bedside coaching. Of the 148 nurses, 118 were observed by a CogChamp assessing a patient for delirium using the CAM and were certified as being competent in using the tool.	Level IV	Quasi-experimental (non-blinded)	After a multi-method action plan, nurses' knowledge and screening rates of delirium increased from 35% prior to 69% after intervention. Theme: Nurses education improves detection of delirium.

progressive care nurses and other nursing staff employed at the cardiac specialty hospital.

INTERVENTION

A cardiac surgery nurse practitioner, in collaboration with the hospital's Clinical Nurse Specialist (CNS), developed evidence-based delirium education with input from the organization's geriatrician and nurse leaders. Educational content included delirium types with emphasis on the identification of hypoactive and mixed delirium, risk factors, prevention strategies, recognition and screening, appropriate management, and guidance for discussion with patients and their families.

Between January and March 2025, education was presented during required competency updates and a voluntary lunch-and-learn session, which included a PowerPoint presentation, video vignettes of patient scenarios, and one-on-one demonstrations of both the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU²⁰) and the Brief Confusion Assessment Method (bCAM²¹). Interdisciplinary communication of positive delirium screens was emphasized, including provider notification to support prompt geriatric consultation.

To reinforce learning, delirium education was presented during two consecutive team meetings. The first session included key delirium concepts along with review of the CAM-ICU and bCAM. The second session included case studies of recent patients who had experienced delirium.

Delirium screening documentation was incorporated into quality rounds, held weekdays at noon. During rounds, leadership asked each bedside nurse whether their patients had a positive delirium screening.

Education attendance was not formally tracked. Team meetings included both day and night shift staff, whereas the optional lunch-and-learn session and one-on-one CAM-ICU and bCAM demonstrations were primarily offered during daytime hours. Education was implemented as planned; however, participation in each component was not measured.

STUDY OF THE INTERVENTION

This project evaluated changes in nurses' delirium knowledge, frequency of delirium screening documentation, and timing of geriatric consultation.

MEASURES

Data was collected from pre- and post-education surveys and chart audits.

NDKA

To measure nurses' delirium knowledge before and after the educational intervention, the Nurses' Delirium Knowledge Assessment (NDKA) was utilized.¹⁸ The pre-education NDKA was completed by over 60 nursing staff. For staff unable to attend in-person education sessions, pre-education NDKAs were distributed and collected, and a recorded ver-

sion of the educational PowerPoint was provided via email. Both day and night nurses also had opportunities to participate in informal one-on-one CAM-ICU and bCAM demonstrations during their scheduled shifts. Depending on participation timing, the post-education NDKA was completed before or after team meeting education and reinforcement throughout leadership rounds. Only participants with matched pre- and post-intervention NDKA data ($n = 17$) were included in the analysis.

Permission to use and modify the NDKA was obtained via email from one of the original study's contributors (D. Wynaden, personal communication, September 14, 2024). Minor modifications were made to improve relevance to the postoperative cardiac surgery population, including removal of one item specific to orthopedic patients and one item related to gender-specific incidence.²²⁻²⁴ The modified NDKA consisted of 26 items, including one multiple-choice question assessing general delirium knowledge followed by agree, disagree, and unsure responses for the remaining items. A total score was computed for all 26 items.

Pre- and post-education NDKA questionnaires were scored for all participants. Each of the 26 items was assigned one point. Incorrect answers and questions answered as "unsure" were scored as "0". Correct answers were given a "1".

NDKA Validity/Reliability. With the initial utilization of the NDKA, Hare et al.¹⁸ state that content validity was not assessed; however, Aldawood et al.⁷ performed a pilot study to evaluate the reliability of a modified version of the NDKA and reported an internal consistency reliability of 0.80.

Demographics. Nurses' age range, sex, hours worked per week, years of healthcare experience, and educational level were recorded.

SCREENING DOCUMENTATION

The organization's electronic health record (EHR) included an optional delirium screening section based on the four features of delirium (acute change or fluctuation, inattention, altered level of consciousness, and disorganized thinking) in the CAM framework.²⁵ Nurses documented the presence or absence of these features to generate a positive or negative delirium screen. The EHR was structured based on the CAM-ICU for non-verbal patients and the bCAM for verbal patients but did not specify which assessment should be performed; therefore, documentation outcomes were analyzed collectively. Because the organization utilized a universal bed model, intensive care and progressive care patients were analyzed together.

In a meta-analysis, the CAM-ICU demonstrated a pooled sensitivity of 80.0%, and a pooled specificity of 95.9%.²⁶ While the bCAM was originally created for the emergency department, it has been utilized effectively in non-critically ill patients.²⁷ Validity testing of the bCAM in the emergency department setting has indicated a 93% specificity and 65% sensitivity.²⁸

CHART AUDITS

A chart audit tool was created to track delirium screening documentation and the timing of geriatrician consults. The tool included patient age, delirium screening documentation in the first seven postoperative days, whether delirium was identified during hospitalization, and the postoperative day of the geriatrician consult.

Patient identifiers were not included on the tool. Chart audits were performed on all patients over the age of 65 years who underwent sternotomy with cardiopulmonary bypass in the full month prior to education, December 2024, and in the full month following education, April 2025. The pre-education group included 49 patients, and the post-education group included 42 patients.

Regardless of the number of delirium screenings performed per shift, documentation by the day shift nurse and the night shift nurse was counted once per shift. Documentation was reviewed for up to the first seven postoperative days or until hospital discharge, whichever occurred first. The denominator for each patient consisted of the total number of eligible nursing shifts during hospitalization, and the numerator consisted of the number of shifts with documented delirium screening. The proportion of nursing shifts with delirium screening documentation was calculated for each patient. Timing of geriatric consultation was defined as postoperative day (POD) of the first documented geriatrician consultation. Data from the chart audit tool was converted to an Excel spreadsheet for analysis.

ANALYSIS

Statistical significance was set at $p < .05$. Intellectus Statistics Software (2024) was used to evaluate the stated outcomes of the intervention with assistance from a statistician.

A Shapiro–Wilk test was used to assess normality of continuous variables. Paired pre- and post-education NDKA scores were analyzed using a two-tailed paired t test. When normality assumptions were met, differences in before and after education delirium screening documentation frequency were evaluated using independent samples t tests. A Mann–Whitney U test was utilized for non-normally distributed night-shift documentation data. Timing of geriatric consultation before and after education was also analyzed using an independent samples t test.

Effect sizes were calculated using Cohen's d . Power analysis was performed to determine the minimum sample sizes to yield a statistical power of at least 0.80 for detecting small ($d = 0.2$), medium ($d = 0.5$), and large ($d = 0.8$) effect sizes, respectively.

ETHICAL CONSIDERATIONS

Prior to the intervention, approval was obtained from two Institutional Review Boards (IRBs). Nurse participation was voluntary, and the purpose and procedures of the project were explained prior to participation. In accordance with the requirements of one IRB, written informed consent was obtained from nursing staff participants.

Table 2. NDKA Questionnaire Demographics

	number	percentage
Title		
Registered Nurse	13	76.47
Guest Care Provider	2	11.76
Physician Assistant	2	11.76
Years in Healthcare		
6-12y	8	47.06
<5 y	6	35.29
>12 y	3	17.65
Age		
31-40	7	41.18
41-50	1	5.88
20-30	6	35.29
>51	3	17.65
Qualifications		
Bachelor's	12	70.59
Certificate/Diploma	1	5.88
Master's	3	17.65
High school/GED	1	5.88
Gender		
Male	6	35.29
Female	11	64.71
Hours		
40-64	5	29.41
<40	11	64.71
>64	1	5.88

Note. Due to rounding errors, percentages may not equal 100%.

RESULTS

NURSES' KNOWLEDGE

Seventeen participants completed a Nurses' Delirium Knowledge Assessment (NDKA) questionnaire both before and after education.

DEMOGRAPHICS

Most of the participants were female (64.71%), bachelor-prepared (70.59%), and had worked in healthcare for 6-12 years (47.06%). Additional demographic details are presented in [Table 2](#).

RESPONSES

Pre- and post-education scores were paired using a unique identifier. Based on a total possible score of 26 points, the mean pre-test score was 20.53 (SD = 2.53) compared with 22.65 (SD = 1.93) post-test, indicating a statistically significant improvement [$t(16) = -3.65$, $p = .002$] with a large effect size ($d=0.884$; [Figure 2](#)).

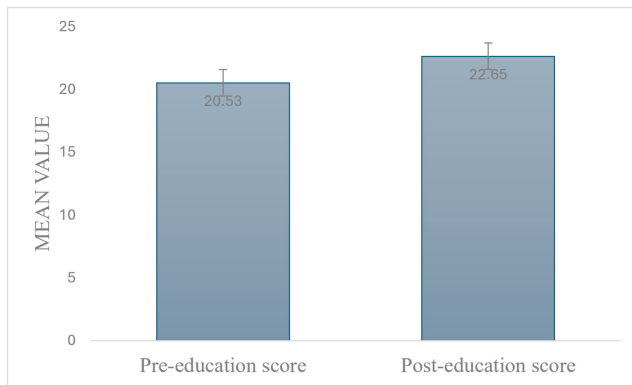


Figure 2. The Means of Nurses' Delirium Knowledge Assessment Scores Pre- and Post-education

Note: 95.00% CI Error Bars included

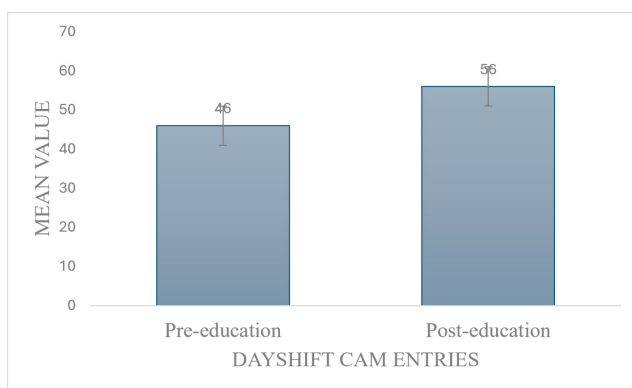


Figure 3. The Means of completed Confusion Assessment Method Documentation for Day Shift Pre- and Post-Education

Note: 95.00% CI Error Bars included

DELIRIUM SCREENING DOCUMENTATION

Documentation was analyzed separately for day and night shifts, as well as for both shifts combined.

DAY SHIFT

In the pre-education group ($n = 49$), the rate of completion for day shift documentation was 46% ($SD = 0.22$) compared with 56% ($SD = 0.22$) post-education. This difference was statistically significant [$t(89) = 2.05$, $p = .044$] with a moderate effect size ($d = 0.43$; [Figure 3](#)).

COMBINED SHIFTS

Combined shift documentation did not differ significantly before and after education [$t(89) = -0.63$, $p = .527$; $d = 0.133$].

NIGHT SHIFT

Night shift documentation was analyzed using a Mann-Whitney U test, with no significant difference be-

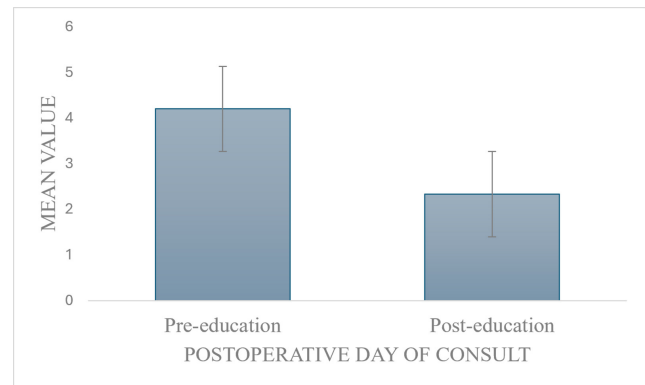


Figure 4. The Mean Postoperative Day of Geriatric Consult Pre- and Post-Education

Note: 95.00% CI Error Bars included

tween pre- and post-education ranks ($U = 1163.5$, $z = -1.07$, $p = .283$).

TIME TO GERIATRICIAN CONSULT

The mean postoperative day (POD) of geriatric consultation decreased from pre-education ($M = 4.20$, $SD = 3.01$) to post-education ($M = 2.33$, $SD = 1.21$). Although not statistically significant, the observed effect size was large [$t(14) = -1.43$, $p = .173$; $d = 0.81$; [Figure 4](#)].

DISCUSSION

NDKA RESPONSES

The findings are consistent with evidence demonstrating that education improves nurses' knowledge and awareness of delirium.^{7-9,11-15} Baseline NDKA scores were relatively high prior to education, indicating pre-existing knowledge of delirium and possibly limiting improvement in scores after education. This may reflect the cardiac surgery population of predominantly older adults, which aligns with previous findings that familiarity with delirium is often higher in geriatric-focused settings²⁹ compared with ICU settings.⁷ This variation in baseline knowledge may explain the modest improvement observed in this study, despite statistical significance and large effect size.

Over 60 nursing staff completed the pre-intervention assessment; however, post-intervention completion was lower. Because NDKA participation was voluntary, nurses with interest in delirium education or quality improvement may have been more likely to participate, which limits the generalizability of findings.

DELIRIUM SCREENING DOCUMENTATION

Improved day shift documentation aligns with literature showing that structured education improves delirium screening practices. Ewens et al.¹⁰ reported a significant increase in use of a cognitive assessment tool with documentation rising from 8.5% pre-intervention to 43% post-

intervention. Similarly, Travers et al.¹⁶ demonstrated improvements in screening rates from 35% to 69%.

Both day and night shift staff received delirium education during required team meetings; however, additional one-on-one CAM-ICU and bCAM demonstrations and an optional lunch-and-learn session were more accessible to day shift nurses. Differences in educational exposure and leadership reinforcement may have contributed to improved day shift documentation. Limited access to education and reduced leadership presence at night have been identified as barriers to consistent implementation of practice change across shifts.^{30,31} Future educational interventions should include structured strategies to engage off-hour staff.^{32,33}

GERIATRIC CONSULT

Although not statistically significant, the trend toward earlier geriatric consultation is consistent with previous research suggesting that education may influence clinical response to delirium. Alhalaiqa et al.⁸ found that education improved nurses' ability to detect delirium, while also increasing implementation of nonpharmacologic management and provider notification. Similarly, Travers et al.¹⁶ reported practice changes following delirium education, including reduced benzodiazepine use. Together, these studies suggest that improved delirium knowledge may translate into changes in clinical decision-making. In the current project, the decrease in postoperative day of geriatric consultation may reflect increased awareness of delirium and earlier intervention but should be interpreted cautiously due to small sample size ($n = 16$).

LIMITATIONS

The limitations of this project include generalizability, sample size, and instrumentation factors. Because the project was conducted at a single 80-bed cardiac specialty hospital, the results may not be applicable to other hospital settings or patient populations.

The low number of completed pre- and post-education NDKA questionnaires ($n = 17$) limits interpretation of the intervention's impact. Because attendance was not formally tracked, staff reach cannot be determined. Pre-intervention survey completion exceeded post-intervention completion, and the overall effect may be underestimated due to the small number of paired responses. Similarly, the small number of patients with delirium who received postoperative geriatric consultation may have contributed to non-significant findings despite a large effect size.

Testing of content validity of the Nurses' Delirium Knowledge Assessment (NDKA) was not reported by Hare et al.¹⁸ Additionally, the NDKA was modified to align with the project setting and target population. While acceptable internal consistency has been reported in modified NDKA instruments,⁷ the modified version used in this project was not evaluated. These limitations should be considered, particularly given the small sample size.

Nurses' delirium screening documentation may represent workflow compliance rather than delirium recognition.

The impact of increased delirium screening documentation on nursing workload was not evaluated, and compliance may diminish over time without ongoing reinforcement.

Short-term and resource staff were not included in the educational intervention due to organizational structure, and differences in staffing patterns between shifts were not measured, which may have influenced delirium screening documentation outcomes.

Because the EHR did not differentiate between CAM-ICU and bCAM use, delirium screening documentation was analyzed collectively. Findings should be interpreted as documentation practices rather than assessment-specific outcomes.

SUSTAINABILITY

For project sustainability, delirium education was integrated into orientation curriculum. CAM-ICU and bCAM one-on-one demonstrations were added to annual competency updates to standardize assessment practices. Day and night shift nursing leadership were engaged to reinforce the importance of delirium screening documentation every shift.

RECOMMENDATIONS

Future initiatives should include resource and short-term staff and utilize simulation and case-based learning, as evidence suggests these approaches are more effective than didactic instruction alone (Montgomery et al., 2024). Reinforcement through spaced repetition, case studies, and continued involvement of the geriatric team may further strengthen delirium knowledge and screening practices.^{9,12}

CONCLUSION

This project highlights that even small, focused delirium educational interventions can improve nursing staff's knowledge and documentation practices. Future projects should evaluate whether delirium screening documentation translates to changes in care, including non-pharmacologic interventions, medication review, and interdisciplinary collaboration.

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AUTHOR CONTRIBUTIONS

Original draft preparation: Dara Commons

Revising and editing: Lori Alesia, Mary Browning, Dara Commons, and Diane Smith

ETHICS STATEMENT

Prior to delirium education, approval was obtained by the Ascension St. Vincent and University of Indianapolis In-

stitutional Review Boards (IRBs). Nurses' participation in the project was voluntary, and project details were fully explained prior to obtaining written informed consent.

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DECLARATION OF INTERESTS

There are no conflicts of interest to disclose.

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CONFLICTS OF INTEREST

None

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ABBREVIATIONS

American Geriatrics Society (AGS); Brief Confusion Assessment Method (bCAM); Clinical Nurse Specialist (CNS); Confusion Assessment Method (CAM); Confusion Assessment Method for the Intensive Care Unit (CAM-ICU); Nurses' Delirium Knowledge Assessment (NDKA); postoperative delirium (POD)

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