Multimodal Education Program to Improve Nurses' Knowledge and Confidence on Delirium Recognition in a Surgical-Trauma Intermediate-Care Setting

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Background: High incidence of delirium in hospitalized patients has been reported in the United States and is significantly associated with increased morbidity and mortality. The lack of knowledge and confidence in performing delirium assessment (KCDA) has led to significant underrecognition of delirium by nurses regardless of evidence-based education intervention. **Objective:** The purpose of this study was to determine the effectiveness of a multimodal educational program (MEP) to enhance nurses' KCDA. **Methods:** A MEP including an online didactic with a video-simulation and 1:1 bedside coaching with delirium screening (DS) was conducted in the surgical intermediate-care unit of an academic medical center. A quasi-experimental pre- and post-test design was used. **Results:** Of 23 nurses, the majority were <41 years old (73.9%) and had at least a bachelor of science in nursing degree (78.3%) with <6 years of experience (60.9%). The overall KCDA scores and the performance of DS improved significantly after the MEP ($p < .001$). A positive correlation was noted between the changes of the KCDA scores ($p = .009$). **Conclusions:** The MEP demonstrated improvement in nurses' KCDA. The MEP should focus on an individualized learning approach with a targeted patient population, using current delirium screening tools. **Implications for Nursing:** Educational programs are recommended in either an orientation or continuing education program on nursing units. This is also recommended for use in other academic centers that encompass similar clinical settings and could possibly be considered for use in other disease processes.

Keywords: delirium recognition; delirium assessment; delirium knowledge; delirium education

High incidence of delirium in hospitalized patients has been reported in the United States, causing a significant economic burden annually and an increase in hospital cost per patient (Inouye, Westendorp, Saczynski, Kimchi, & Cleinman, 2014). However, the condition is easily neglected and remains underrecognized, which necessitates interventions to promote awareness of delirium recognition (DR; Hipp & Ely, 2012; LaMantia et al., 2017). A bedside nurse is on the frontline in patient care. It is their responsibility to recognize changes in the patient's attention, level of consciousness, and cognitive function at an early stage (Brixey & Mahon, 2010). Frequent and accurate assessment by bedside RNs is essential for early DR (Girard, Panharipande, & Ely, 2008). Literature demonstrates that delirium is not frequently identified due to a lack of

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knowledge and confidence that may affect the reliability in assessing the onset of delirium (Flagg, Cox, McDowell, Mwose, & Buelow, 2010; Ista et al., 2014; Selim & Ely, 2017).

Background

Delirium is defined as "an acute onset of brain dysfunction associated with fluctuating mental status, lack of attention, and either unorganized thinking or altered level of consciousness" caused by many combined factors (American Psychiatric Association, 1999). Incidences of delirium in hospitalized patients have been reported in approximately 25%–56% of patients admitted in general wards, 70%–87% in ICU; 36%–53% (as high as 87% in the elderly population) post-surgery, and 83% in post-acute care settings (Inouye, Foreman, Mion, Katz, & Cooney, 2001). Bryczkowski, Lopreiato, Yonclas, Sacca, and Mosenthal (2014) and Angles et al. (2008) indicated overall occurrence of delirium in surgical and trauma units was approximately 60%. General etiology of delirium remains imperfectly understood (Speed, 2015). Delirium often occurs after acute illness, surgery, or hospitalization, which results in increased length of hospital stay, increased morbidity and mortality, loss of independence, long-term care facility stays, high healthcare cost, and worsening dementia, leading to long-term cognitive problems and poor quality of life (Gregory, 2016; Yanamadala, Wieland, & Heflin, 2013).

Delirium remains underrecognized by bedside RNs at all levels of severity (El Hussein, Hirst, & Salyers, 2015). A literature review revealed that RNs lacked knowledge of delirium because of limited education in the nursing curriculum or routinely in the work setting (Baker, Taggart, Nivens, & Tillman, 2015; Elliott, 2014). Insufficient delirium knowledge (DK) and inaccurate delirium assessment (DA) are strongly associated with lack of confidence on DR (Flagg et al., 2010; Hare, Wynaden, McGowan, Landsborough, & Speed, 2008; Selim & Ely, 2017).

Evidence-based educational intervention has demonstrated improvement in RNs' knowledge of delirium (Gesin et al., 2012; Gordon, Melillo, Nannini, & Lakatos, 2013; McCrow, Sullivan, & Beattie, 2013; Speed, 2015; Van de Steeg, Ijkema, Wagner, & Langelaan, 2015; Yanamadala et al., 2013). The American Geriatrics Society (AGS) Clinical Practice Guidelines emphasized that education should focus on DR and screening and include one-to-one peer support with a feedback session (The American Geriatrics Society Expert Panel on Postoperative Delirium in Older Adults, 2015). However, the optimal education delivery method and its outcomes remain inconsistent (Gesin et al., 2012). Many studies utilized self-reports of performance/confidence on DR without any objective evaluation, which may not necessarily reflect actual confidence in performance (Yanamadala et al., 2013). Thus, the purpose of the study was to determine effectiveness of a multimodal educational program (MEP) to enhance RNs' knowledge and confidence on DR. The fundamental elements of Bandura's Self-Efficacy Theory were used to develop the educational intervention (Bandura, 1993; Mann et al., 2012).

Methods

Design

A quasi-experimental pre- and post-test design was used to evaluate changes in RNs' knowledge and confidence on DR and in RNs' ability to correctly use a delirium screening instrument via direct observation before and after participating in the MEP.

Setting and Sample

The project was conducted in the surgical-trauma intermediate-care unit (SIMU) at an academic medical center on the east coast of the United States. The SIMU is a 12-bed unit and 23 bedside RNs are employed. All bedside RNs were invited and consented to participate. Exclusion criteria for participation included float pool or non-unit based nurses, nursing assistants, APRNs.

Procedures

Institutional social and behavioral science review board approval was obtained. RNs were recruited via e-mail invitation, flyers, and verbal announcements. Once informed consent was signed, participants blindly picked a small, unique numbered sticker from a bowl of stickers, and were instructed to keep the sticker on the back of their name badge for the duration of the study. The participants entered this number on all assessment instruments for data matching purposes. The online education consisted of a 10-minute didactic presentation with an 8-minute video-recorded simulation and a 15-minute of 1:1 bedside coaching. The online didactic included definitions, pathophysiology, epidemiology, risk factors, different types of delirium and clinical manifestations, consequences, different delirium screening tools, current delirium screening tool used at the institution, as well as general prevention and management of delirium with institution guidelines. For video-recorded simulation, the scenario script was developed by the investigator based on hypoactive delirium seen in patients. Standardized patient, a nurse and a family member ran the scenario while the video was recorded. The recorded video was transformed into

a private YouTube. One-to-one bedside coaching was composed of an extensive review of the delirium screening tool, individual direction and advice with each nurse (Gordon et al., 2013). Each nurse was asked for a return demonstration in using the screening tool to the coaches. The coaches provided individualized constructive feedback to each nurse.

Outcome Measures

The Nurses' Delirium Knowledge Questionnaire (NDKQ) was adapted to evaluate nursing DK before and immediately after online training (Hare et al., 2008). The original 36-item assessment evaluated specific DK and risk factors; a 25-item assessment was used with permission from the original author. The measure was a combination of delirium definition, knowledge of screening tools, and knowledge of delirium in general and risk factors.

The Confidence Scale (C-Scale) was used to evaluate RNs' confidence level in performing DA before and after the MEP. The confidence scale contains five statements with five points of a Likert-type scale, with higher scores corresponding to greater confidence (Grundy, 1993).

The Nursing Delirium Screening Scale (Nu-DESC) is the delirium screening instrument currently being used in the SIMU at the facility. It was initially evaluated and validated by Gaudreau, Gagnon, Harel, Tremblay, and Roy (2005) for use in hematology–oncology and internal medicine units, and revalidated by Luetz et al. (2010) for use in ICU post-operative patients. Luetz et al. (2010) reported a higher sensitivity of 83% and relatively high specificity of 81%, compared to the Confusion Assessment Method for the ICU (CAM-ICU) ($p < .0001$). Either the investigator or a unit delirium champion (evaluators) observed each RN's performance in using the Nu-DESC before and after the MEP. Each produced a Nu-DESC result. The two results were compared and scored as positive for agreement and negative otherwise.

Data Analysis

Descriptive and inferential statistics were computed using IBM SPSS statistic software version 24. The level of significance was at .05 for all testing of significance. A descriptive statistical analysis was computed for demographic characteristics of the participants, the assessment scores, and agreement of the pre- and post-direct observation between the evaluators and the participants on delirium screening.

A paired t test was used to determine whether pre-post changes in the assessments of knowledge and confidence were significantly different from zero. Additionally, McNemar's tests were used to evaluate pre-post changes in agreement (positive/negative) between nurses' and evaluators' DAs and to evaluate pre-post changes in six individual items in knowledge assessment. The Kruskal–Wallis H test and the Mann–Whitney U test were used to compare the mean pre-post in knowledge and confidence assessments over categories of demographic characteristics. Spearman's rho correlation between change in knowledge and change in confidence was computed.

Results

All 23 SIMU RNs participated in the MEP. The MEP was offered from the beginning of September to the end of October 2018. All participants completed pre- and post-assessment instruments.

Demographics

Demographic information was collected from all participants and is shown in Table 1. Data revealed the majority of RNs who responded to the questionnaire were <41 years old (n = 17, 73.9%) and were female (n = 21, 91.3%). Most participants (n = 18, 78.3%) had at least a bachelor of science in nursing (BSN) degree. More than half (n = 14, 60.9%) of participants had <6 years of nursing experience. The data indicated that 16 (69.6%) of participants reported having received at least one delirium-related education training session in the past.

Nurses' Delirium Knowledge Questionnaire

For the 25-item NDKQ, the pre-assessment mean score was 74.6% (M = 18.65, standard deviation [SD] = 3.34) and the post-assessment mean score was 91.5% (M = 22.87, SD = 2.42). Fourteen respondents (60.9%) scored ≥75% on overall pre-assessment score, which increased to 21 (91.3%) on overall post-assessment score. The mean increase in the overall NDKQ was 4.22 (SD = 3.04) and was a statistically significant improvement from pre-intervention to post-intervention, $t(22) = 6.643$, $p < .001$ (two-tailed), based on a paired t test (see Table 2 and Figure 1).

The subscale scores of the NDKQ also increased significantly from pre-assessment to post-assessment. The mean knowledge of screening tools subscale score, with a possible high score of five, increased from 3.39 to 4.04 ($t[22] = 4.832$, $p < .001$). The mean knowledge of delirium general and risk factors subscale score, with a possible high score of 19, increased from 14.35 to 17.91, ($t[22] = 6.738$, $p < .001$; see Table 2). Twenty-one RNs (91.3%) correctly answered the delirium definition on both pre- and post-assessment.

TABLE 1. Demographic Characteristics of the Delirium Project Participants in SIMU (n = 23)

Variables	*n*	Percent
Age range (yrs)		
20–30	11	47.8
31–40	6	26.1
41–60	6	26.1
Gender		
Female	21	91.3
Years of nursing experiences		
<1 yr	2	8.7
1–5	12	52.2
6–10	4	17.4
11 and up	5	21.7
Years of health system employee		
<1 yr	3	13.0
1–5	16	69.6
11 and up	4	17.4
Nursing education preparation		
ADN	5	21.7
BSN and higher	18	78.3
Numbers of delirium training		
None	7	30.4
Once	11	47.8
Twice	5	21.7

Note. SIMU = surgical intermediate-care unit; ADN = associate degree in nursing; BSN = bachelor of science in nursing.

TABLE 2. Statistical Analysis of Pre- and Post-Assessment of Knowledge, Confidence, and Direct Observation (n = 23)

	M (*SD*)	*M* (*SD*)	Score Ranges				
NDKQ and C-Scale Scores	Pre	Post	Pre	Post	*M Pre-Post Difference* (*SD*)	*p* Value	95% CI
Definition of delirium[a]	.91 (.29)	.91 (.29)	0–1	0–1	.00 (.30)	1.00[g]	-
Screening tools[b]	3.39 (1.03)	4.04 (1.22)	1–5	1–5	.65 (.65)	<.001[h]	.37–.93
Delirium general/risk factors[c]	14.35 (2.72)	17.91 (1.31)	10–19	15–19	3.57 (2.54)	<.001[h]	2.47–4.66
Total NDKQ scores[d]	18.65 (3.34)	22.87 (2.42)	11–25	17–25	4.22 (3.04)	<.001[h]	2.90–5.53
C-scale scores[e]	16.43 (4.37)	22.91 (2.70)	8–25	16–25	6.48 (3.68)	<.001[h]	4.89–8.07
	n	*n*	%	%			
	Pre	Post	Pre	Post			
Direct observation							
Agreed-Positive[f]	5	23	21.7	100.0	-	<.001[g]	-
Disagreed-Negative[f]	18	0	78.3	0	-		-

Notes. *SD* = standard deviation; *M* = mean; CI = confidence interval, the level of significance was at .05 for all testing of significance; NDKQ = Nurses' Delirium Knowledge Questionnaire; C-Scale = Confidence Scale.

[a–d] Subscales of delirium knowledge test were scored separately with a total score being computed overall (Hare et al., 2008). The range of the total score is from 0 to 25 and a higher score corresponds to greater knowledge. [e]The confidence scale contains five statements with five points of a Likert-type scale, with higher scores corresponding to greater confidence. A total score ranged from five (low confidence) to 25 (high confidence; Grundy, 1993). [f]The investigator produced a Nu-DESC score and result, either "positive" or "negative," while also observing the nurse's performance. The nurse also produced a Nu-DESC score and result based on her or his assessment. The two Nu-DESC results were compared and scored as positive for agreement and negative otherwise. [g]Exact McNemar's test *p* value. [h]Paired *t* test analysis.

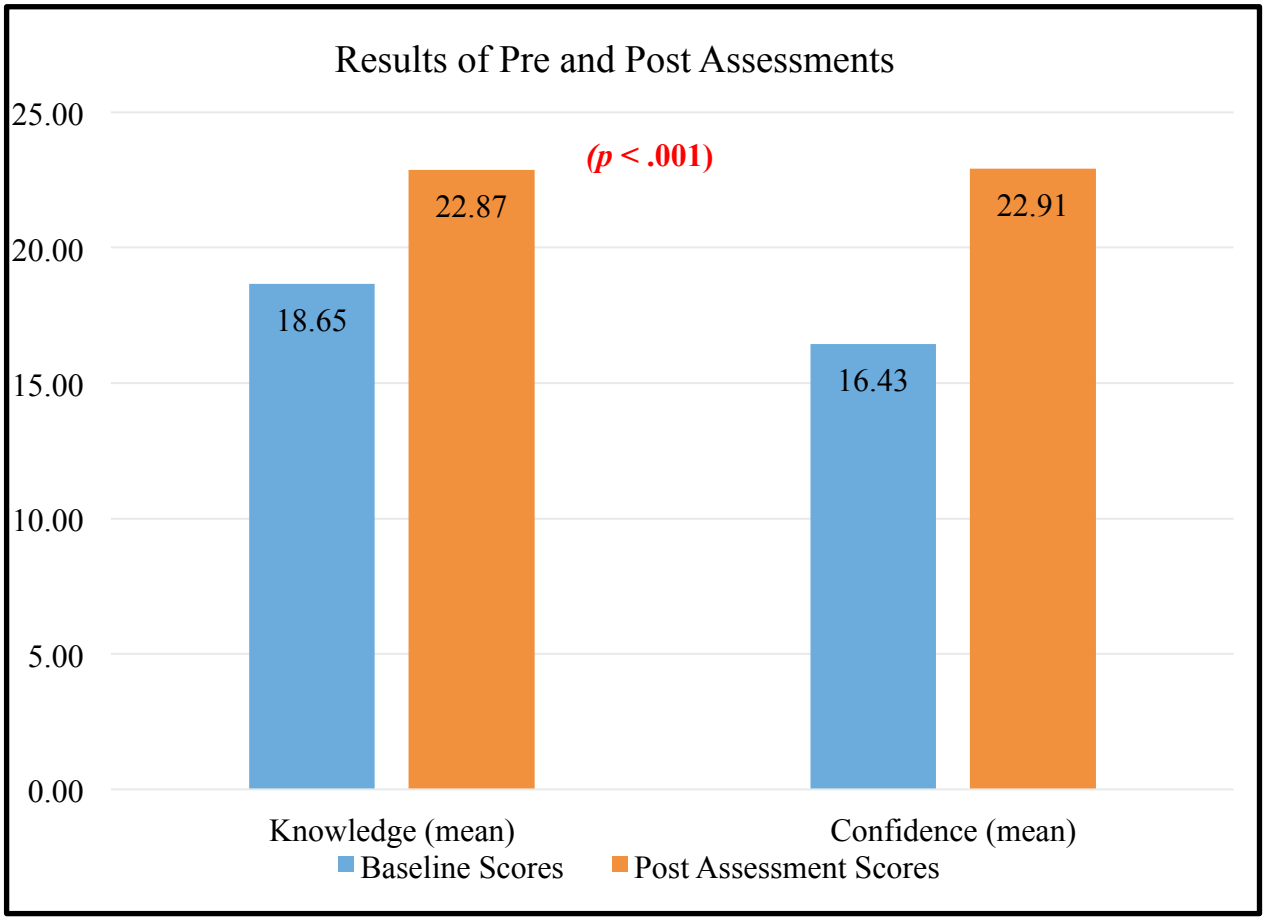

Figure 1. Comparison of pre- and post-knowledge and confidence assessments. The mean increase in the overall NDKQ was 4.22 (*SD* = 3.04) and was a statistically significant improvement in the overall NDKQ scores from the pre-intervention to the post-intervention, $t(22) = 6.643$, $p < .001$ (two-tailed), based on a paired t test. The mean increase in the confidence scores was 6.48 (*SD* = 3.68), which showed a statistical significant improvement, $t(22) = 8.445$, $p < .001$ (two-tailed), based on a paired t test. ***Notes.*** NDKQ = Nurses' Delirium Knowledge Questionnaire; *SD* = standard deviation.

Further, the lowest numbers of correct answers on the pre-assessment were following: "Mini-Mental State Examination (MMSE) is a screening tool for delirium and dementia" (n = 22, 95.7%); "males are more at risk for delirium than female" (n = 20, 87%); "symptoms of depression may mimic delirium" (n = 13, 56.5%); and "a patient who is lethargic and difficult to arouse does not have a delirium" (n = 11, 47.8%). However, statistically significant improvement showed based on McNemar's test after online education.

C-Scale

For the five-item C-Scale, the mean score was 16.43 (*SD* = 4.37) for pre-assessment and 22.91 (*SD* = 2.70) for post-assessment. Twelve (52.2%) of the participants had above an average score of confidence in using the Nu-DESC and only one reported having the highest confidence on pre-assessment. After the MEP, all participants (n = 23, 100%) achieved above average score of confidence and 10 of those (43.5%) achieved the highest confidence level. Further, the mean increase in confidence scores was 6.48 (*SD* = 3.68), which illustrated statistically significant improvement, $t(22) = 8.445$, $p < 001$ (two-tailed), based on a paired t test (see Table 2 and Figure 1).

Demographic Group Comparison

The Kruskal–Wallis H test and the Mann–Whitney U test were used to compare the means of pre-post changes in knowledge and confidence assessments over the categories within demographic characteristics and none of the tests were significant (see Table 3).

Correlation Analysis

Correlation between changes of pre- and post-NDKQ and changes of pre- and post-C-Scale were measured by Spearman's rho correlation. Overall, the result illustrated that the pre-post change in the NDKQ was positively associated with the pre-post change in the C-Scale (*rho* [22] = .529, p = .009; see Figure 2). In addition, the

TABLE 3. Comparison of Demographic Groups to Mean of Pre-Post Differences in Knowledge and Confidence Assessments (n = 23)

	Overall NDKQ			C-Scale		
Demographic	M Pre-Post Diff	95% CI	p	M Pre-Post Diff	95% CI	p
Age (years)						
20–30 (n = 11)	3.64	1.40–5.87	.222[a]	5.45	3.01–7.90	.466[a]
31–40 (n = 6)	3.50	.63–6.37		6.67	2.54–10.79	
41–60 (n = 6)	6.00	3.43–8.57		8.17	4.57–11.77	
Years of experience						
<6 (n = 14)	3.64	1.84–5.45	.305[b]	5.64	3.45–7.83	.277[b]
6 or up (n = 9)	5.11	2.92–7.30		7.78	5.26–10.29	
Education preparation						
ADN (n = 5)	3.00	.52–5.48	.290[b]	5.20	2.11–8.29	.363[b]
BSN & up (n = 18)	4.56	2.94–6.17		6.83	4.88–8.79	
# of Delirium trainings						
None (n = 7)	4.43	1.56–7.30	.861[a]	7.71	3.59–11.84	.377[a]
Once (n = 11)	4.36	2.01–6.72		6.55	4.64–8.45	
Twice (n = 5)	3.60	.74–6.46		4.60	–.56–9.76	

Note. NDKQ = Nurses' Delirium Knowledge Questionnaire; C-Scale = Confidence Scale; M Pre-Post Diff = mean pre-post difference; ADN = associate degree in nursing; BSN = bachelor of science in nursing; CI = confidence interval. The level of significance was at .05 for all testing of significance.
[a]Exact Kruskal–Wallis H test p value. [b]Exact Mann–Whitney U test p value.

correlation between pre-post change in the C-Scale and pre-post change in the delirium general and risk factors subscale was positive (*rho* [22] = .539, p = .008). However, there were no statistically significant correlations between the pre-post change in the C-Scale and the pre-post changes in delirium definition and screening tool knowledge subscales.

Direct Observation

Direct observation data were analyzed to investigate frequency of agreement in the Nu-DESC results between evaluators and the RNs. At the baseline observation, most RNs (n = 18, 78.3%) did not screen patients correctly using the Nu-DESC and were in disagreement (negative) with evaluators; all scored the Nu-DESC without asking the patients' hallucination or illusion status. At the same time, however, 12 of the 23 participants (52.2%) reported themselves having above average level of confidence in performing the Nu-DESC assessment, although 10 of the 12 (83.3%) failed to perform the assessment correctly. After the 1:1 bedside coaching, all RNs (n = 23, 100%) performed the assessment correctly in using the Nu-DESC and the results were in agreement (positive) with coaches. This increase was statistically significant based on McNemar's test with p < .001 (see Table 2 and Figure 3).

Discussion

There is no doubt that RNs are underrecognizing delirium when they do not have adequate DK. Consistent with previous literature, the findings of this study support a lack of RNs' knowledge on delirium including screening tools, risk factors, clinical manifestations, and complications of delirium (Baker et al., 2015; Elliott, 2014; Flagg et al., 2010; Meako et al., 2011; Selim & Ely, 2016; Sinvani, Kozikowski, Pekmezaris, Akerman, & Wolf-Klein, 2016; Speed, 2015). Of 23 participants, nine (39.1%) scored ≤ 75% on both overall pre-NDKQ and pre-knowledge of screening tool subscale, which were reported similarly by Speed (2015). In particular, approximately half of participants failed to identify symptoms of hypoactive delirium at baseline in this study. This finding is consistent with previous literature that hypoactive delirium is least likely to be recognized by RNs due to lack of knowledge (Detroyer et al, 2016; Elliott, 2014; Flagg et al., 2010; Hare et al., 2008; McCrow et al., 2013; Sinvani et al., 2016). Moreover, the findings of this study demonstrated poor performance in using the Nu-DESC by RNs, which were similar to findings reported by Varghese, Macaden, Premkumar, Mathews, and Kumar (2014). This could be results of insufficient knowledge in this aspect and could impede an accurate DA using a delirium screening instrument in a daily practice (Elliott, 2014; Flagg et al., 2010; Selim & Ely, 2016; Sinvani et al., 2016).

Almost all RNs (95.7%) did not realize that the Mini-Mental State Examination (MMSE) is a screening tool for both delirium and dementia, which concurs with findings by Sinvani et al. (2016). This specialized screening tool is not used frequently in the clinical setting by bedside RNs. If RNs receive any

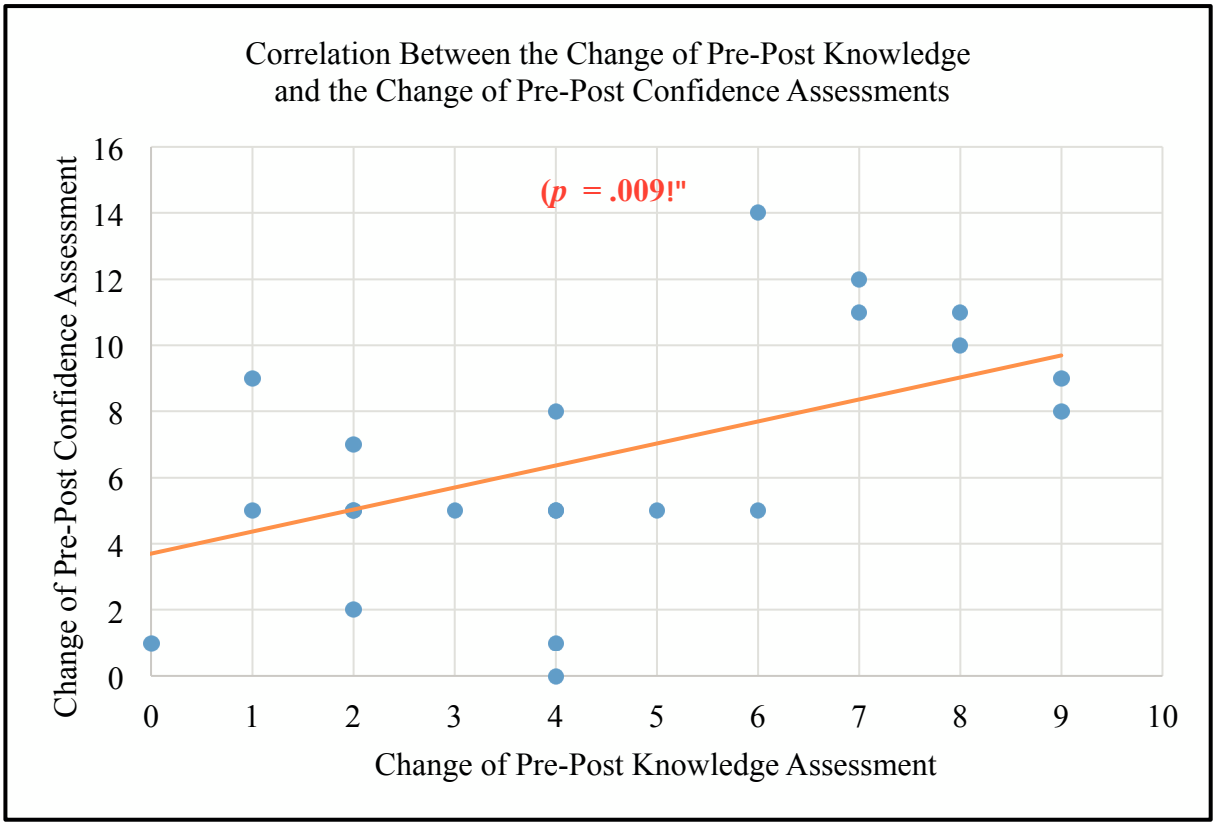

Figure 2. Correlation between the pre-post differences of knowledge and confidence assessment. The pre-post change in the knowledge assessment was positively associated with the pre-post change in confidence scale (*rho* [22] = .529, *p* = .009).

geriatric training or delirium training, they would be more likely to answer this question correctly (Sinvani et al., 2016). Most RNs (91.3%) answered correctly on definition of delirium at baseline, which was a similar aspect but lower result (67%) as reported by Elliott (2014); in contrast, Van de Steeg et al. (2015) found that RNs scored lowest at baseline on the definition of delirium. This could be due to the fact that institutions had paid more attention to delirium as a quality improvement in the United States compared to other countries. However, since a variety of knowledge assessment instruments have been used to measure the definition of delirium, it may not be plausible to compare this specific score with other studies in each country.

Further, the author found no statistically significant relationship between pre-post change in knowledge and confidence assessments and age, nursing experience, educational preparation or previous delirium education status, which are evident in previous literature (Baker et al., 2015; Blevins & DeGennaro, 2018; Hick et al., 2017; Speed, 2015; Van de Steeg et al., 2015; Varghese et al., 2014). However, some trends were observed. Greater age, more years of nursing experience, and higher educational level were associated with greater pre-post improvement in delirium knowledge and confidence assessments. A larger sample size would be necessary to address this inconsistency in future research.

Several studies have examined and revealed that educational interventions for nurses were effective in improving knowledge and confidence regarding DR (Detroyer et al., 2016; Gesin et al., 2012; Gordon et al., 2013; McCrow et al., 2013; Meako et al., 2011; Smith, Van Aman, Schneiderhahn, Edelman, & Ercole, 2017; Speed, 2015; Van de Steeg et al., 2015). The systematic review illustrated that a MEP was the most effective way to improve DR by nurses (Yanamadala et al., 2013). As witnessed in this project along with previous findings, this MEP, including the online program with video-recorded simulation and bedside coaching, demonstrated a significant improvement in nursing knowledge by 22.6% and confidence by 39.4% in using the delirium screening instrument. However, an online education requires sufficient self-discipline to complete it without supervision regardless of flexibility and low cost (Detroyer et al., 2016). Frequent follow-up e-mails, verbal reminders, and/or financial reward would be necessary to promote sufficient self-discipline during the training. It may require use of other interactive activity in combination to eliminate barriers to online training.

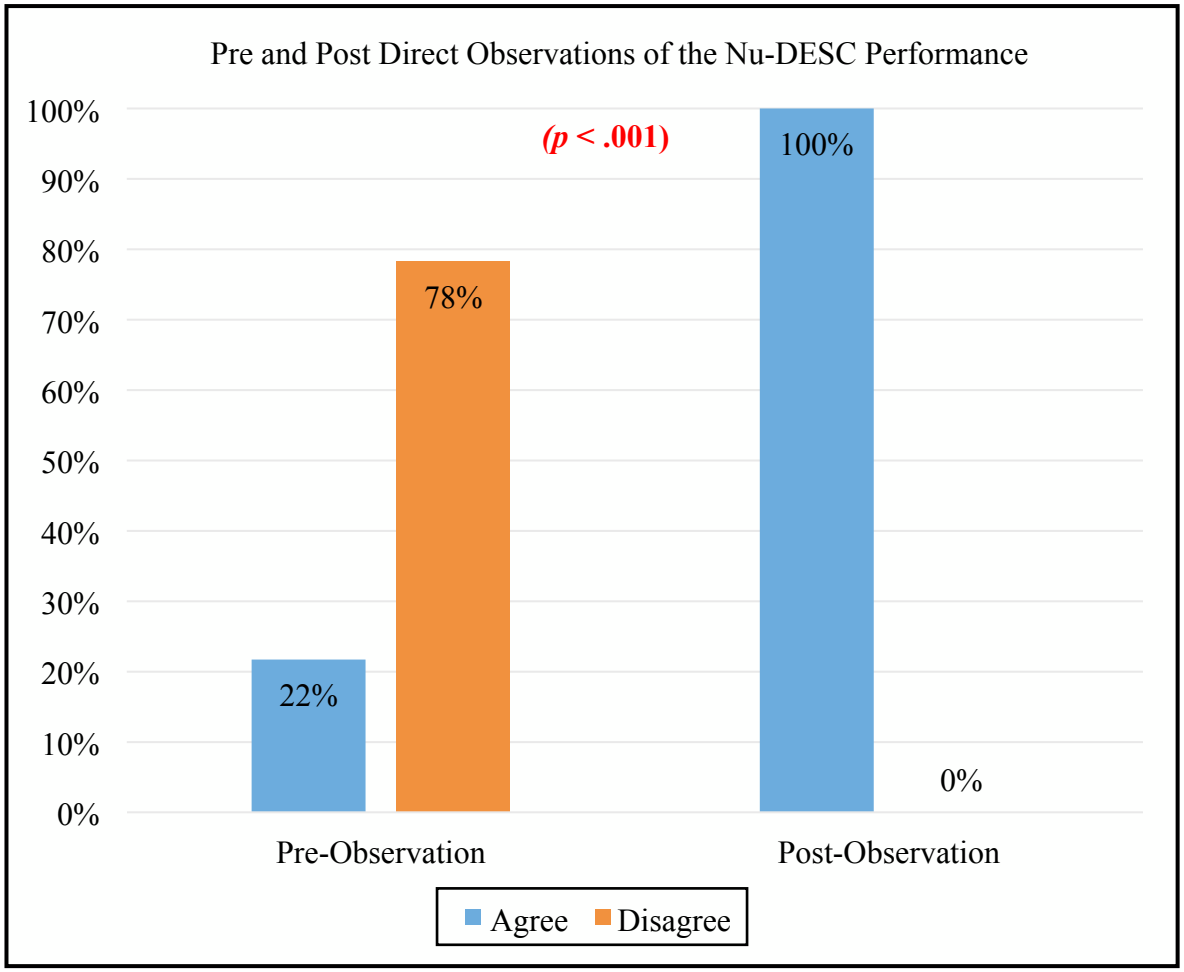

Figure 3. Comparison of pre- and post-direct observation. At the baseline observation, the majority of nurses (n = 18, 78.3%) did not screen patients correctly in using a Nu-DESC and were in disagreement between the coaches and the nurses. However, after the 1:1 bedside coaching, all of nurses (n = 23, 100%) performed correctly in using an Nu-DESC and the results were in agreement with the coaches' one. This increase was statistically significant based on McNemar's test with $p < .001$.

Many studies recommended bedside teaching as the most effective way to combine theory and practical intervention to improve DR by RNs (Elliott, 2014; Gesin et al., 2012; Gordon et al., 2013). This study demonstrated that the educational program coupled with a 1:1 bedside coaching in use of the Nu-DESC significantly improved confidence and practice in process of care. RNs' accuracy of delirium screening and confidence level in using the Nu-DESC were problematic at baseline in this study; 78.3% of RNs failed to ask the patient's hallucination or illusion status regardless of their self-confidence level. This could be because RNs believe delirium does not present with illusion or hallucination (Sinvani et al., 2016). After the coaching session, the dramatic change from 21.7% to 100% of agreed or positive results between coaches and RNs should be viewed as a key successful point of this study. This is most likely attributed that bedside coaching was intended to focus on improving a specific skill of delirium screening by using a scale (Gordon et al., 2013).

Additionally, this finding demonstrated that a "train-the-trainer" approach in using a delirium champion worked efficiently and effectively as an educational strategy to educate peers at the bedside (Gesin et al., 2012). The unit delirium champion promoted peer RNs by giving immediate performance feedback and actively engaging them to change their practices when it was in conjunction with the intervention (Doran & Sidani, 2007; Flodgren et al., 2011; Kitson et al., 2008; Yevchak et al., 2014). It is crucial to have strong trusting relationships with nursing staff when implementing an evidence-based practice in the clinical setting (Yevchak et al., 2014). Using a unit delirium champion who already has established good relationship with RNs facilitated active engagement of RNs in the solution (Yevchak et al., 2014). This study's findings add to that body of knowledge, demonstrating that adoption of a unit delirium champion across the clinical setting can optimize delivery of the education intervention.

Many studies utilized self-report of performance/-confidence in using a delirium screening instrument without any objective evaluation or without directly observing performance (Akechi et al., 2010; Hickin, White, & Knopp-Sihota, 2017; LaFever, Bory, & Nelson, 2015; Ramaswamy et al., 2011; Smith et al., 2017; Speed, 2015; Yanamadala et al., 2013). The self-reporting confidence and/or performance may not necessarily reflect RNs' actual performance in accurate delirium screening. Of 23 participants, 12 (52.2%) reported themselves having above an average level of confidence in performing the Nu-DESC assessment, however, 10 of those (83.3%) failed to perform the assessment correctly. This study pointed out that directly observing RNs' performance in using a delirium screening instrument is necessary to validate their performance after education. Future research is recommended whether the routine delirium screening has been maintained in daily practice after education over time.

Limitations

Limitations included a small sample size and restriction to one specialty unit at the institution, which may limit generalizability. Another possibility would be that RNs would use other sources of information to answer knowledge questions. The investigator did not have any control in the online learning environment because participants most likely completed their tests on their own time. Additionally, there was no measure of knowledge and confidence retention after the MEP because of investigator time constraints, which would be important information to have for future educational program planning and would be recommended for future research. Moreover, although this project confirmed a statistically significant increase in knowledge and confidence on DR, the clinical value of this intervention, such as patient outcomes affected by accurate delirium assessment after education was not measured; therefore, further research is warranted.

Conclusion

There is substantial evidence about effectiveness of evidence-based educational interventions on DR. Implementation of an MEP on DR requires comprehensive strategies to facilitate a learning environment that supports nurses' motivation. As witnessed, the MEP with the use of current delirium screening instrument is crucial to improve RNs' knowledge and confidence. The intervention should focus on an individualized learning approach, including 1:1 bedside coaching, the invaluable role of a unit delirium champion, with a targeted patient populations and settings. This MEP is recommended for use in other academic centers that encompass similar clinical settings and could possibly be considered for use in other disease processes. Future research is warranted to investigate knowledge and confidence retention of nurses after education and the effect on patient outcomes by accurate DAs.

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