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Delirium Education Program for Critical Care Nurses: A Mixed Methods Study

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DELIRIUM EDUCATION PROGRAM FOR CRITICAL CARE NURSES:

A MIXED METHODS STUDY

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Abstract

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Approximately 10-30% of hospital admissions develop delirium where nearly 30-40% of the delirium cases are preventable. Non-detection rates by acute care healthcare workers were reported at 72-75%. Hence, it is crucial for hospitals to develop delirium education programs focused on early recognition and prevention. Thus, the purpose of this mixed method study was to develop and evaluate the effect of a delirium education program (DEP) on improving critical care nurses' knowledge and self-confidence in identifying delirium and the associated risk factors. In the quantitative strand (Phase I) of the study, both the intervention and control groups completed the online pre-tests and posttests consisting of demographic survey, Nurses' Knowledge of Delirium (NKD), and Confidence Scale (C-Scale). The intervention group attended the DEP that included an online education module followed by one-on-one case study/vignettes with role playing. Data analysis of Phase I informed the decisions regarding the sampling for the qualitative strand (Phase II). The quantitative data were analyzed utilizing a mixed model Analysis of Variance (ANOVA) to test whether there were significant effects of the between group subject factor (group membership: intervention vs control), within group subject Time factor (pre-intervention vs post-intervention scores), and the Group by Time interaction. For Phase II, audio-taped phone interviews were conducted to gain a deeper understanding of the

lived experiences of the nurses related to DEP. Dataset of the qualitative strand was then embedded into the quantitative dataset to come up with the final results of the study.

Keywords: education, delirium, knowledge, self-confidence, experiences.

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Dedication

This work is dedicated to my family.

To my husband, who has always been supportive in all my endeavors and has provided with unconditional love, support and understanding.

To my children, who has provided me with love and support.

To my late father who instilled in me the significance of perseverance and patience in life. Most especially to my mother who has taught me the value of education and the importance of lifelong learning.

To my brother and sister who has been always there to support me.

How lucky I am to have each of you in my life.

Last but not the least, this research study is dedicated to all patients who one way or the other have experienced delirium at one point of their lives. Hopefully, this study will aid in advancing knowledge and skills of nurses in the early identification and prevention of delirium in the acute care setting and improve patient outcomes.

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Chapter 1

Introduction

Background and Significance

Approximately 10-30% of general hospital admissions develop delirium. Delirium affects about 80% of patients admitted in critical care units (Devlin, Brummel, & Al-Qadheeb, 2012). Nearly 30-40% of delirium cases in the hospital are preventable (Fosnight, 2010). Delirium has significant adverse outcomes, such as increased length of hospital stay, decreased physical and cognitive functions, increased mortality and morbidity, and increased costs to the healthcare settings thus, early prevention and recognition are vital (Aguirre, 2010; Anderson, Ngo, & Marcantonio, 2012; Andrejaitiene, & Sirvinskas, 2011; Balas et al., 2015; Baron, & Holmes, 2013; Davidson, Winkelman, Gelinas, Dermenchyan, 2015; Fong et al., 2012; Foster et al., 2010; Mangusan, Hooper, Denslow, Travis, 2015; Praditsuwan et al., 2013). Non-detection rates by healthcare workers in the acute care setting were reported at 72-75% (Collins, Blanchard, Tookman & Sampson, 2010; Rice et al., 2011). Hence, it is crucial for hospitals to develop education programs geared towards improving detection, early recognition, and prevention of delirium to improve patient outcomes and decrease healthcare costs. Health care providers should be educated on preventive measures, risk factors, signs and symptoms of delirium (Kalish, Gillham, & Unwin, 2014; Teodorczuk, Reynish, Milisen, 2012). Nurses who spend more time with patients play a crucial role in the prevention of delirium, improving detection rates, advocating for early prevention and management interventions, and providing necessary care to patients with delirium (Baker, Taggard, Nivens, & Tillman, 2015; Cerejeira & Mukaetova-Ladinska, 2011; Faught 2014; McCrow, Sullivan, & Beattie,2014; Whitehorne, et al., 2015).

Research Problem Statement

There was literature that described the importance of education with regards to delirium, however, there is still a scarcity of information regarding effective educational programs, strategies or interventions (Akechi et al., 2010). Thus, the intent of this study was to address the gap in existing literature in the development of an effective delirium educational program in the acute care setting to help improve nurses' knowledge and self-confidence in delirium recognition to positively impact elderly patient outcomes. The results of this study may provide clinical educators and key nurse leaders how to develop and utilize a delirium education program in nursing staff development in the acute care setting through exploring and understanding the experiences and perceptions of the nurses who received the delirium education program.

Purpose of the Study

The purpose of this mixed methods study was to develop and evaluate the effect of a delirium education program on improving critical care nurses' knowledge and self-confidence in identifying delirium and the associated risk factors. In addition, the study explored nurses' perception of their experience of the delirium education program.

Research Questions and Hypotheses

This study attempted to determine the effect of a delirium education program on nurses' knowledge and self-confidence in identifying delirium and the associated risk factors and perspectives and experiences of the delirium education program.

This study addressed the following research questions and hypotheses.

Research Question 1: What is the effect of the delirium education program on nurses' knowledge and self-confidence in identifying delirium and the associated risk factors?

H_{1a}: Nurses who participate in the delirium education program will have a greater improvement in knowledge in identifying delirium and the associated risk factors post intervention, compared to nurses who do not participate in the delirium education program.

H_{1b}: Nurses who participate in the delirium education program will have a greater improvement in self-confidence in identifying delirium and the associated risk factors post intervention, compared to nurses who do not participate in the delirium education program.

The independent variable for this study was the participation in delirium education program. The dependent variables were knowledge and self-confidence of the participants in identifying delirium and the associated risk factors.

Research Question 2: What are the experiences or perceptions of nurses of the delirium education program?

Chapter 2

Literature Review

The purpose of this mixed methods study was to develop and evaluate the effect of a delirium education program on critical care nurses' knowledge and self-confidence in identifying or recognizing delirium and its associated risk factors. Furthermore, it explored nurses' perceptions and experiences of the delirium education program. There is scarcity of information regarding effective educational programs, strategies or interventions, and its usefulness in the acute care settings (Akechi et al., 2010). Thus, it was the intent of this study to address the gap in existing literature with regards to the development of an effective delirium educational program in the acute care setting to help improve nurses' knowledge and self-confidence in delirium recognition positively impacting elderly patient outcomes.

This chapter's focus was a discussion of the major concepts that are significant to this study which includes but is not limited to delirium, pathophysiology, risk factors, types of delirium, assessment, prevention, instruments in assessing delirium, prognosis, and management. In addition, there was a discussion on educational interventions for delirium and their effects or benefits in the acute care setting.

Delirium

Delirium is a preventable. Early recognition and assessment of delirium by the healthcare professional can prevent delirium (Yang et al., 2013). Nurses at the patient's bedside play a significant role in the early recognition and detection of delirium in the acute care setting (Akechi et al, 2010; Hare et al., 2008). However, the non-detection rate of delirium in the acute care setting has been reported at 72-75% (Collins et al., 2010; Rice et al., 2011). Improving the

knowledge and skills of nurses in the early assessment, recognition, and treatment of delirium is crucial in improving patient outcomes.

Definition of Delirium

The word delirium came from the Latin word "Lira" which means furrow or "Delirare" which means to jump out of the furrow (Delirium, n.d.). Delirium is defined as an altered state of consciousness characterized by inattention, difficulty focusing, or easily distractibility. These changes in cognition that develops over a few hours or days and fluctuates over time (Delirium, n.d.; Hare et al., 2008; Huang et al., 2012; Thomas et al., 2012). The Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5) diagnostic criteria for delirium include: 1) disturbance in level of awareness or attention, 2) cognitive change, 3) disturbance that develops over short period of time (hours to days) which fluctuates during the course of the day, and 4) history, physical examination, or laboratory findings showing the physiological consequences of a general medical condition, substance abuse, or other causes (Balas et al., 2012; Desai, Chau, & George, 2013; European Delirium Association (EDA) & American Delirium Society (ADS), 2014). Synonyms of delirium include acute brain dysfunction, acute mental status change, acute confusional state, confusion, post-operative psychosis, intensive care unit (ICU) psychosis, acute organic syndrome and encephalopathy (Mittal et al., 2011).

Clinical Features

The distinctive clinical features of delirium are include: 1) acute onset, 2) lack of alertness, 3) inattention, 4) disorientation to time and place, 5) memory loss, 6) disorganized thinking, 7) perceptual disturbances, and 8) fluctuation in psychomotor activity (Huang et al., 2012; Tullman, Fletcher, Foreman, 2012). These features are important attributes of delirium that

nurses in the acute care setting need to be able to recognize and assess to aid in early detection of delirium. Table 1 summarizes the clinical features of delirium.

Table 1

Clinical Features of Delirium

Clinical Feature	Description
Acute onset	Hours to few days
Evidence of underlying condition	Comorbidities, other diseases
Alertness	Fluctuates from stupor to hypervigilance
Attention	Inattentive, easily distractible, difficulty shifting attention from one focus to another, difficulty keeping track of what is being said
Orientation	Disorientated to time and place
Memory	Inability to remember events of hospitalization or illness, instructions, forget events, activities, etc
Thinking	Disorganized thinking, irrelevant, incoherent, illogical
Perception	Perceptual disturbances – illusions, hallucinations (visual/auditory)
Psychomotor	Fluctuate between hypoactive, hyperactive, and mixed subtypes

Note: Adapted from Huang et al., 2012; Tullman et al., 2012

Pathophysiology

The pathophysiology of delirium is unknown however, some view it as a complex multifactorial causal mechanism. Current evidence shows that it is caused by: 1) neurotransmitter alterations – reduced acetylcholine; 2) inflammation – associated to trauma, infection, surgery increasing the production of proinflammatory cytokines; 3) anatomical lesions – brain lesions; 4) acute stress response – high cortisol levels precipitates delirium; 5) neuronal injury – causes metabolic and ischemic insults to the brain such as hypoxemia, hypoglycemia, and others; 6) metabolic and electrolyte disorders (Cerejeira et al., 2012; Kamholz, 2010; Lawlor & Bush, 2014; Maniou, 2012; Zaal & Slooter, 2012; Inouye, Westendorp, & Saczynski, 2014).

Delirium versus Dementia

Delirium is an altered state or disturbance of consciousness with inattention and changes in cognition that develops over a few hours or days and fluctuates over time (Hare et al., 2008; Huang et al., 2012; Mistraletti et al., 2012; Thomas et al., 2012). On the other hand, dementia has a gradual onset that develops over months or years. Although in dementia there is no noted fluctuation in alertness, sleep can be disturbed with night-time wandering and difficulty with short-term memory (Holly, Cantwell, & Jadotte, 2012). Dementia-superimposed delirium (DSD) is when signs and symptoms of delirium are present in a patient suffering from dementia (Steis, & Fick, 2012). Its diagnosis is challenging due to the fact that changes in cognitive function may be confused with psychological symptoms of patients with dementia (Morandi et al., 2012). DSD occurs in 22-89% of hospitalized or community dwelling patients (Flanagan, & Fick, 2010). According to Fick, Stein, Waller, and Inouye (2013), the overall incidence of DSD is 32%. The short-term mortality rate, increased length of stay, and poorer function at discharge of DSD patients is about 25% (Fick, Steis, Waller, & Inouye, 2013). (See Table 2)

Table 2

Differentiating Delirium and Dementia

Characteristics	Delirium	Dementia
Onset	Acute or subacute	Chronic
Duration	Hours to days	Months to years
Course	Fluctuating	Slow decline
Consciousness	Impaired	Unimpaired until late course of illness
Attention	Impaired – short attention span	Usually normal
Time of day	Worse at night	No change
Memory	Impaired – recent & immediate	Impaired – recent and remote
Speech	Slow incoherent; slurred	Aphasic, anomic, difficulty finding words
Sleep-Wake cycle	Abnormal; cycles reversed	Usually normal however, awakens during the night
Hallucinations and delusions	Visual, auditory, tactile	No hallucinations but maybe with delusions
Reversibility	Potential for reversibility	Irreversible

Note adapted from Flanagan, & Fick, 2010; Fick, Steis, Waller, & Inouye, 2013; Mistraletti, et al., 2012; Steis, & Fick, 2012; Vanderbilt University Medical Center ICU Delirium and Cognitive Impairment Study Group, n.d.; Wilkins, n.d.

Clinical Subtypes

Delirium has three clinical subtypes namely: hyperactive, hypoactive, and mixed (Grover et al., 2014; Hare et al., 2008; Kiely, Jones, Bergmann, & Marcantonio, 2012; Kostas, Zimmerman, & Rudolph, 2012; Mistraletti et al., 2012; Morandi et al., 2012; Steiner, 2011; Vanderbilt University Medical Center – ICU Delirium and Cognitive Study Group, n.d.; Wilkins, n.d.). Among these clinical subtypes, hypoactive delirium has the highest mortality. Patients with hypoactive delirium are 1.62 times more likely to die compared to the other subtypes due to its late recognition (Kiely, Jones, Bergmann, & Marcantonio, 2012). Differences between the subtypes are presented in Table 3 below.

Table 3

Clinical Subtypes of Delirium

Characteristics	Hyperactive	Hypoactive	Mixed
Level of alertness	Overly attentive, hyperalert	Drowsy, lethargic	Alternates between hyperactive and hypoactive
Motor activity	Increased	Decreased	
Thinking ability	Easily distracted	Difficulty focusing	

Note: Adapted from Grover et al., 2014; Hare et al., 2008; Kiely, Jones, Bergmann, & Marcantonio, 2012; Kostas, Zimmerman, & Rudolph, 2012; Mistraletti et al., 2012; Morandi et al., 2012; Steiner, 2011; Vanderbilt University Medical Center – ICU Delirium and Cognitive Study Group, n.d.; Wilkins, n.d.

Risk Factors

Many risk factors for delirium have been identified and prevention of delirium has been associated with identifying at risk patients. The Multifactorial Model of Delirium looks into the interrelationship of the contributing factors that put the patients at risk for delirium, and the patients' baseline vulnerability during hospital admission (Inouye, Westendorp, & Saczynstki, 2014). Delirium encompasses the interrelationship between vulnerability of the patients and precipitating factors (Inouye, Westendorp, & Saczynstki, 2014). Other researchers agree to the fact that delirium is caused by a combination of both the predisposing and precipitating risk factors (Brooks, 2012). Predisposing risk factors are patient characteristics that increase their likelihood of developing delirium. These predisposing risk factors are usually nonmodifiable (Balas et al., 2015; Desai, Chau, & George, 2013) and affect a patient's vulnerability for developing delirium at the hospital (Inouye, Westendorp, & Saczynstki, 2014). The predisposing risk factors for delirium include: advanced age, sex, pre-existing cognitive impairment or dementia, vision/hearing impairment, history of alcohol abuse, severity of illness, functional impairment, and depression. Preexisting dementia as a risk factor increases the risk of the patient developing delirium by about two to three times (Barr et al., 2013; Brooks, 2012).

Precipitating factors which are modifiable (Balas et al., 2015; Desai, Chau, & George, 2013) include acute illness, medications such as antihistamines, dopaminergics, anticholinergics, and benzodiazepines (Balas et al., 2015; Rothberg et al, 2013), environmental factors (McCusker, et al., 2013), sleep deprivation, infection or sepsis, (Khurana, Gambhir, & Kishore, 2011), metabolic disturbance, immobilization (Balas et al., 2015; McCusker et al., 2011; Steiner, 2011; Zaal & Slooter, 2012), post-cardiac surgery (Andrejaitiene & Sirvinkas, 2011; Godfrey et al., 2013; Mangusan, Hooper, Denslow, & Travis, 2015; National Institute for Health and Care

Excellence (NICE), 2010; Thomas et al., 2012), use of physical restraints, pain, dehydration, anxiety, lack of sleep, fractures or hip surgery (Deschodt et al., 2012), and primary neurologic diseases (McCusker et al., 2013; Koster, et al., 2011; Steiner, 2011; Zaal & Slooter, 2012).

Differential Diagnoses

The differential diagnoses of delirium have been noted in the literature. Vanderbilt University Medical Center – ICU Delirium and Cognitive Study Group (n.d.) provided a mnemonics of the differential diagnoses of delirium. DELIRIUMS mnemonics stands for: "D – drugs; E – Eyes, ears, and other sensory deficits; L – low O2 states (myocardial infarction, stroke, and pulmonary embolism); I – infection; R – retention (urine or stool); I – ictal state; U – underhydration/undernutrition; M – metabolic causes (diabetes mellitus, post-operative state, sodium abnormalities); S – subdural hematoma" (p. 3).

Tools for the Assessment of Delirium

Several instruments for assessment of delirium have been developed over time to help recognize this condition. Some of these instruments include: Clinical Assessment of Confusion A (CAC-A), Confusion Assessment Method (CAM), 3-D CAM, CAM-S, Confusion Rating Scale (CRS), Confusional State Evaluation (CSE), Cognitive Test for Delirium (CTD), Delirium Assessment Scale (DAS), Delirium Index (DI), Delirium Observation Screening Scale (DOS), Delirium Rating Scale (DRS), Delirium Symptom Review (DSR), Delirium Severity Scale (DSS), Memorial Delirium Assessment Scale (MDAS), NEECHAM Confusion Scale, Nursing Delirium Screening Scale (NuDesc), Organic Brain Syndrome Scale (OBS), Delirium-O-Meter ,Mini Mental State Examination (MMSE), Single Question in Delirium (SQiD), Intensive Care Delirium Screening Checklist (ICDSC) (Adamis, et al., 2010; Bergeron, Dubois, Dumont, Dial, & Skrobik, 2001; Bjorkelund et al., 2006; Detroyer et al, 2014; de Jonghe et al., 2005; Inouye et

al., 2014; Lawlor & Bush, 2014; Marcantonio et al., 2014; Sands et al., 2010; Schuurmans et al., 2013; Ringdal et al., 2011, Vasilevski, Han, Hughes, & Wesley, 2012). Despite available tools to detect delirium this condition still remains difficult to identify.

Prognosis

The onset of delirium has a significant negative impact on patient outcomes. The consequences include increased hospital length of stay, increased mortality and morbidity, increased cost and financial burden of hospital, long-term care, long term cognitive impairment, and increased risk for hospital acquired infections (de Lange, Verhaak, & van der Meer, 2013; Desai, Chau, & George, 2012; Gleason, et al., 2015; Zaal & Slooter, 2012).

Pharmacologic Management

Pharmacologic management of delirium should be tried after non-pharmacologic interventions are not effective in treating delirium (Desai, Chau, & George, 2013). Evidence in the literature supports that pharmacological management should be reserved for patients with severe agitation who are at risk of harming themselves or others or causing disruption of care. Pharmacologic management of delirium includes: 1) anti-psychotics: haloperidol, olanzapine, quetiapine, risperidone, and ziprasidone; 2) intravenous sedatives and analgesics: dexmetomedine, lorazepam, midazolam, opioids, and propofol (Desai, Chau, & George, 2013, Mattoo, Grover, & Gupta, 2010; Hillard, Brown, & Mitchinson, 2015; Mistraletti et al., 2012; Serafim et al., 2015; Zaal & Slooter, 2012).

Non-pharmacologic Management

Prevention is the most effective strategy to minimize the incidence of delirium. The non-pharmacologic strategies to prevent delirium focus on a multicomponent approach.

Environmental care. Environmental care modification includes patient reorientation to time, place, person; simple, clear communication; provision of routine care; utilization of alternative measures to refrain from use of restraints such as sitters, technology (i.e. chair and bed alarms); increased surveillance and rounding; decrease in number of visitors, noise reduction, lighting to match time of day, and normal sleep-wake cycle, etc. (Carr, 2013; Conley, 2011; Cooter & Evans, 2012; Day, Higgins, & Keatinge, 2011; Fick, & Mion, 2013; Flaherty & Little, 2011; Mistraletti et al., 2012);

Clinical practice guidelines and protocols. The following are the hospital-based guidelines or protocols developed with the aim of decreasing delirium in the hospital: (AACN, 2011; Conley, 2011; Desai, Chau, & George, 2013; Douglas et al., 2013; Quinlan & Rudolph, 2011; Fick, & Mion, 2013; Mistraletti et al., 2012; Lorenzi, Fusgen, & Noacher, 2012; Mudge, Maussen, Duncan, & Denaro, 2013; Trogrlic et al., 2015; Vanderbilt University Medical Center ICU Delirium and Cognitive Impairment Study Group, n.d.):

1. Delirium risk assessment
2. ABCDE bundle is highly recommended for delirium prevention. Integration of the ABCDE bundle to the multidisciplinary and multicomponent implementation program to decrease delirium incidence can potentially improve patient outcomes. ABCDE bundle stands for awakening and breathing trial, coordination, delirium detection and early progressive mobility and exercise;
3. Assess vital signs and oxygen saturation;
4. Monitor blood glucose, electrolytes, intake and output
5. Promote nutrition and hydration
6. Functional optimization and mobilization;

7. Reorientation; use of hearing aids/glasses
8. Modification of environment: decrease visitors; noise reduction; family involvement in patient care; discontinue restraints; consider use of sitters; maintain normal sleep-wake cycle: lighting to match time of time; sleep promotion; discontinue urinary catheter
9. Maximize comfort: assess for urinary retention, constipation; decrease pain through non-pharmacological interventions
10. Minimize drug side effects; review medications that may cause delirium
11. Hospital Elder Life Program (HELP) was developed to prevent delirium and functional decline, allowing elderly patients to go home with maximum level of independence; just as they were previously prior to admission (Strijbos et al., 2013). The implementation of the HELP program in more than 200 hospitals worldwide has brought savings of about $9000 US dollars per patient per year (Inouye, Westendorp, & Saczynski, 2014)

Staff educational intervention. Staff education is also a crucial aspect of delirium prevention. Nurses spend more time with patients and play an essential role in the prevention of delirium. They help improve detection rates, advocate for early prevention and management interventions, and provide necessary care to patients with delirium (Akechi et al., 2010; Baker, Taggart, Nivens, & Tillman, 2015; Baron, & Holmes, 2013; Cerejeira & Mukaetova-Ladinska, 2011; Faught 2014; Kalish, Gillham, & Unwin, 2014; Kostas, Zimmermann, & Ryder, 2012; McCrow, Sullivan, & Beattie,2014; Reynish, Milisen, 2012; Yanamadala, Wieland, & Heflin, 2013).

One of the most important strategies designed to prevent delirium is related to the development of protocols, guidelines and hospital-wide delirium mitigation systems (Allen, et al., 2011; Kostas, Zimmerman, & Rudolph, 2012; Yevchak et al., 2012). Hospital leadership's commitment must not only focus on protocols and guidelines but also to a commitment to staff education (Kostas, Zimmerman, & Rudolph, 2012; Yevchak et al., 2012). Tullman et al. (2012) emphasized the importance of staff education and interprofessional care planning to improve recognition of delirium by staff. Nursing education has been considered an essential component to the success of any new protocol, or initiative (Rivosecchi et al, 2015). Involving nurses in a new clinical practice or initiative on delirium will help increase their willingness to support the change in nursing practice and improve patient outcomes (Davidson et al., 2015). Increasing the awareness and knowledge of staff on the repercussions of delirium in relation to caring for their patients who later become difficult to care for once delirium sets in, maybe key to helping them accept and adapt to the changes brought about by the new clinical practice guideline (Rivosecchi et al, 2015).

Literature was gathered from the disciplines of nursing, psychology, and education. Databases searched included the Cumulative Index of Nursing and Allied Health Literature (CINAHL), Academic Search Premier, PsychINFO, Health Source: Nursing/Academic Edition, Educational Resources Information Center (ERIC), and Cochrane Database of Systematic Reviews. The keyword used for searching was delirium totaling 29,022 results. Advanced search qualifiers or inclusion criteria like English language, full text, peer-reviewed, academic journals, and a time frame of search from 2010-2015 were instituted narrowing the selection to 481 results. The researcher used an additional query, educational intervention, to narrow the search results to 93. This was then followed with a systematic abstract review to assess the significance

of each study. A full-text review was done on each of those primarily focusing on educational interventions for nurses in the recognition of delirium. Additionally, references from these abstracts were reviewed manually with the same inclusion criteria. A total of 13 articles were identified for inclusion. This demonstrates the dearth of literature related to delirium education programs and their impact on nurses' knowledge and self-confidence in the recognition of delirium and the associated risk factors.

Akechi et al. (2010) investigated the effect of a delirium training program on registered nurses working in the acute care setting. A total of 390 out of 408 nurses participated in the study program. However, only 359 completed the pre- and post-training questionnaires. Thirty-two nurses were selected as delirium-link nurses and received the training program. A month after receiving the training, the delirium-link nurses were responsible for training the rest of the nurses in the units on delirium. Results showed that the educational program utilizing delirium-linked nurses to educate was found to improve the self-confidence of the nurses in certain domains. The study was not successful in improving nurses' self-confidence related to the detection and management of delirium (Akechi et al., 2010). This study only examined the self-confidence of the nursing staff post-educational intervention but did not determine the influence of the program on their actual performance or on simulated activities. The authors of this study recommended exploring other educational interventions that might yield better results than theirs in terms of improving nurses' ability to detect delirium early (Akechi et al., 2010). This study was not a randomized controlled trial and several biases may have influenced the findings. There was no clear description of sampling design was used and how the sample size for the control and intervention groups was determined.

A research study called the “Stop Delirium Project” was designed to include an educational intervention to improve delirium care of older people in care homes (Featherstone, Hopton, & Siddiqi, 2010). The educational intervention consisted of interactive teaching modules focused on recognition of delirium, risk factors, prevention, and management. Additionally, “How do you feel” cards were used to create empathy for residents and develop insight into the experience of delirium” (Featherstone et al., 2010). Real life case scenarios were utilized for staff education. Pre- and post-intervention questionnaires and interviews were used to assess the knowledge, self-confidence and practice of the staff. Ninety-one percent of the staff (nurses and care assistants) received the training where 99.7 % considered the training relevant to their work and 97%, considered the training as time well spent (Featherstone et al., 2010). The researchers claimed that interactive teaching modules help increase staff ownership, engagement and pride thus positively affecting their clinical practices. Although this study did not provide any information on how the participants were chosen for the study, it was considered for review due to the fact that it presented a suggested delirium educational intervention.

In a Spanish hospital, an intervention was developed to reduce incidence of delirium during hospitalization in elderly patients (Vidan et al., 2009). One part of this multifaceted program was an educational segment that addressed seven risk areas of delirium. Those were: orientation, sensory impairment, sleep, mobilization, hydration, nutrition, and drug use (Vidan et al, 2009). The educational intervention consisted of teaching sessions related to recognition of delirium and the risk factors (Vidan et al, 2009). Posters on environmental and general prevention measures were posted in the nurses’ station serving as reminders to bedside nurses. Five hundred forty-two patients aged 70 years old and above were included in the study. They either belonged to the intervention group called the Geriatric group (GI) or the Usual Care group

(UG). Only 11.7% of the GI group and 18.5% of the UC group developed delirium (Vidan et al, 2009). These results showed a lower incidence of delirium post-intervention as well as a reduced rate of functional decline (45.5% in GI vs 56.3% in UC) and improved quality indicators (Vidan et al., 2009). Despite the fact that this study did not investigate the impact of the educational intervention on nurses, it was included for review because there was a description of the educational intervention and its effect on patient outcomes.

A combined didactic and two scenario-based (case studies) educational intervention was developed to determine its ability to improve the intensive care unit staff's recognition of delirium at the bedside (Devlin et al., 2008). The two sets of two clinical-based scenarios were consistent with script concordance theory to mimic real-life case scenarios. Fifty ICU nurses participated in the study. Results showed the type of educational intervention used in the study was effective in terms of improving the nurses' clinical recognition of delirium from 12% to 82% and use of the delirium scale correctly from 8% to 62% (Devlin et al, 2008). Clinically-based scenarios proved to be an effective educational strategy to improve learners' knowledge and are least expensive (Devlin et al, 2008).

A total of 338 nurses participated in a study to determine nurses' knowledge of delirium and its risk factors (Hare, Wynaden, & McGowan, 2008). In this study, a 28-item questionnaire was developed and administered. This study did not describe the type of educational intervention that was utilized although results implied that an in-service education type used. Fourteen of the questions were related to delirium and the next 14 to risk factors for delirium. Overall results showed that nurses have inadequate levels of knowledge of the risk factors for delirium (Hare et al., 2008). The nurses who received the educational intervention scored higher than those who did not, but the scores did not extend to the risk factors of delirium (Hare et al., 2008). The

researchers claimed that in-service education is important and that more education is required to improve the nurses' knowledge (Hare et al., 2008). In-service education is usually short and brief which may have affected the results of the study. This study is considered useful to the author because the Delirium Knowledge Questionnaire is the same questionnaire used in this study.

A study done with medical-surgical nursing staff (n=29) in an academic medical center in southeastern United States focused on recognizing delirium superimposed with dementia (DSD) utilizing case vignettes (Fick et al., 2007). The researchers recommended increasing nursing awareness through education of DSD symptoms to help decrease the gap in nursing knowledge related to the results of their study (Fick et al., 2007). The results of this study revealed that those who correctly identify the hypoactive form of DSD and hypoactive delirium were 21% and 41%, respectively (Fick et al., 2007). Although this study only had 29 participants, the findings suggest the need for further delirium education in the hospital.

A scripted unfolding case study on delirium by Page, Kowlowitz, and Alden (2010) focused on older adults was utilized as an educational strategy for nurses, licensed practice nurses (LPNs), and nurse assistants (NAs). The case studies were designed for small groups of five to six participants. Participants did not have prior knowledge regarding the case study but were instructed to identify the case as it unfolded. Additionally, participants were allowed to support one another. A debriefing session was conducted and provided a review of key concepts and knowledge related to the case study and allowed participants to reflect and synthesize their learning experience (Page et al., 2010). A total of 494 healthcare providers participated in the study where 230 were nurses. Results showed that most participants (88.5%) rated the case study as excellent or very good and that the difficulty was just right (86.5%). A majority also agreed

(95.7%) that the learning activity increased their ability to identify strategies to care for delirious patients.

A multifactorial intervention program to reduce delirium duration, length of hospitalization, and mortality rates of delirious patients was developed by Lundstrom et al. (2005). An important component of this program was a staff educational intervention. The education/training was a 2-day course focused on assessment, prevention, and treatment of delirium in the geriatric population. Moreover, the training on nursing intervention was focused on the importance of interaction with patients who have orientation issues as well as optimization of care provided for those types of patients (Lundstrom et al., 2005). This research study demonstrated that the multifactorial intervention decreased the incidence of delirium, length of stay and mortality of patients related to delirium in the intervention ward. A total of 400 patients, age $\geq$ 70 years old were enrolled in the study. Although there was no mention of the number of staff involved in the multifactorial intervention nor was there any mention of how many were in the control or intervention groups, this study was included for review due to the fact that this study reported positive outcomes as a result of the multifactorial intervention where education or training of the staff was a component.

Another multifaceted delirium education intervention and the use of a checklist was conducted with surgical-trauma intensive care unit (STICU) nurses (n=20) to evaluate its impact on nursing knowledge of delirium and ability to evaluate it correctly (Gesin et al., 2015). Results of this study showed that the use of a multifaceted education program improved both the nurses' knowledge about delirium and their ability to recognize delirium (Gesin et al., 2015). The use of the Intensive Care Delirium Screening Checklist (ICDSC) and multifaceted education consisted

of a pharmacist-led didactic lecture, web-based module, and nurse-led bedside training (Gesin et al., 2015).

In another educational intervention aimed toward providing better care of end of life delirium patients (EOLD) was developed by Brajtman, et al. (2012). The concept of interprofessional (IP) education was used. The educational intervention included self-learning modules (SLM) with a McMaster-Ottawa team objective structured clinical encounter (TOSCE) focused on theory and principles of delirium assessment, diagnosis, and management. The convenience sample of 22 caregivers from a long term care facility and a hospice were used. The participants were divided into two groups, SLM and Non-SLM groups. Both groups participated in the Modified TOSCE and "theory burst" on EOLD which includes clinical instruction on definitions, screening tools, clinical features and best practice (Brajtman, et al., 2012). This entire process was repeated two weeks later after the SLM group received their module. At the end of the study, all participants received the module (Brajtman, et al., 2012). The results of the study showed that an educational intervention improved the EOLD knowledge and perceptions of the IP competence of the participants. Furthermore, the results revealed the potential value of the TOSCE as an IP teaching method (Brajtman, et al., 2012). Although this study utilized a small sample size limiting the generalizability of the findings, the results of this pilot study may be useful for future research utilizing TOSCE and IP educational interventions as well as revealing a potentially useful and innovative educational intervention that may be used by nurse educators in the acute care setting.

A study aimed to determine the effect of a comprehensive and sequential intervention (CSI) on knowledge about delirium was performed with nurses (n=58), physicians (n=18), trainees (medical students, residents, fellows, n=19) (Ramaswamy et al., 2011). The CSI was a

two-day program with a progressive four-part didactic series. The intervention included evidence-based reviews of delirium recognition, prevention, management with interactive small group sessions and case conferences with a leading expert on delirium as well as addressed clinical and administrative issues. Results revealed that there was a positive change in knowledge scores in the CSI program and there was a higher improvement in knowledge scores with those who attended two or more lectures compared to those who attended only one lecture. The participants showed a 28% increase in level of confidence in identifying patients with delirium (Ramaswamy et al., 2011).

A systematic review of educational interventions to improve recognition was done by Yanamadala, Wieland, and Heflin (2013). Twenty-six studies were identified. Only 21 studies involved nurses as participants. Two of the studies were not done in an acute care setting, and five were conducted before 2005. There was heterogeneity of educational interventions in the articles that were reviewed by the researchers which made it challenging for them to draw strong conclusions. The studies were classified by the researchers based on the type of educational intervention. Type 1 studies involving the use of didactic sessions were reported to improve knowledge and self-confidence in recognizing delirium. Type 2 studies which involved the use of assessment tools and protocols for practice showed gain in knowledge or self-confidence as well. Type 3 studies utilized workshops to provide information and training on the use of an assessment tool did not demonstrate any improvement or change in self-confidence or knowledge in recognizing delirium. Lastly, type 4 studies that employ resource nurses, feedback on performance, and protocols showed improved staff performance and recognition of delirium and adherence to protocols and initiatives (Yanamadala et al., 2013). Based on this systematic

review of educational intervention strategies, the most effective strategies are providing feedback, clinical pathways, and case studies (Yanamadala et al., 2013).

A randomized controlled trial to evaluate the impact of a delirium specific web-based educational intervention using a pretest/post-test time series design was done with 205 nurses from three different hospitals in Australia to measure delirium knowledge (DK) and delirium recognition (DR) over three time points (McCrow, Sullivan, & Beattie, 2014). The study showed a statistically significant difference between the intervention and non-intervention groups where DK scores were higher in the intervention groups compared to the non-intervention groups (McCrow et al., 2014). For the DR, there is a statistical difference in T1 (baseline) and T2 (post-intervention) mean scores. The study noted positive effects of the delirium specific web-based educational intervention in the acute care nurses' knowledge of and ability to recognize delirium (McCrow et al., 2014). The participants indicated high level of satisfaction with the educational intervention.

Summary

This chapter focused on the discussion of the major concepts that are significant to this study which includes but is not limited to delirium, pathophysiology, risk factors, types of delirium, assessment, prevention, instruments in assessing delirium, prognosis, and management. It further discusses educational interventions for delirium and their effects or benefits in the acute care setting. The educational interventions on delirium for healthcare staff discussed in the literature focused on the following effective strategies or modes of education delivery: interactive sessions, didactic lectures, web-based nurse training, case scenarios, scripted unfolding case studies, team objective structured clinical encounter (TOSCE), in-service education and use of resource nurses for training.

Chapter 3

Methodology

Theoretical Framework

Kolb's Experiential Learning Theory (ELT). The Experiential Learning Theory (ELT) (Kolb, 1999; Kolb, Bayatzis & Mainemelis, 1999) emphasizes the knowledge acquisition through transfer and application of knowledge in a practical learning experience. ELT focuses on the two modes of knowledge acquisition and two modes of transforming experience of adult development (Kolb, Bayatzis & Mainemelis, 1999) allowing the learner to experience, reflect, think, and act during any learning situation in a cyclic process. Knowledge acquisition experience includes concrete experience (CE) and Abstract Conceptualization (AC) (Kolb, 1999). Transforming experience, on the other hand, includes Reflective Observation (RO) and Active Experimentation (AE), (Kolb, 1999).

In this research study, knowledge acquisition happens during the "feeling" phase (CE) when the nurses actively learn about delirium during the online delirium educational intervention. In addition, they further acquire knowledge during the "thinking" phase (AC) when they develop a clear grasp of what they learned related to the concepts of delirium during the online module. Transforming experience occurs when the new knowledge that is acquired is applied at the "doing" phase (AE) that transpires during the one-on-one case study/vignette with role playing activity. Role playing has been found to be an effective method for teaching because it allows the students to realize the significance of the roles they are playing (Wheeler & McNelis, 2014). Role playing consists of three stages (Rowles & Russo, 2009): 1) briefing, 2) actual case scenario, and 3) debriefing. The "watching" phase (RO) is when the nurses reflect

and draw conclusions on their actual learning experience during the debriefing phase of the role playing.

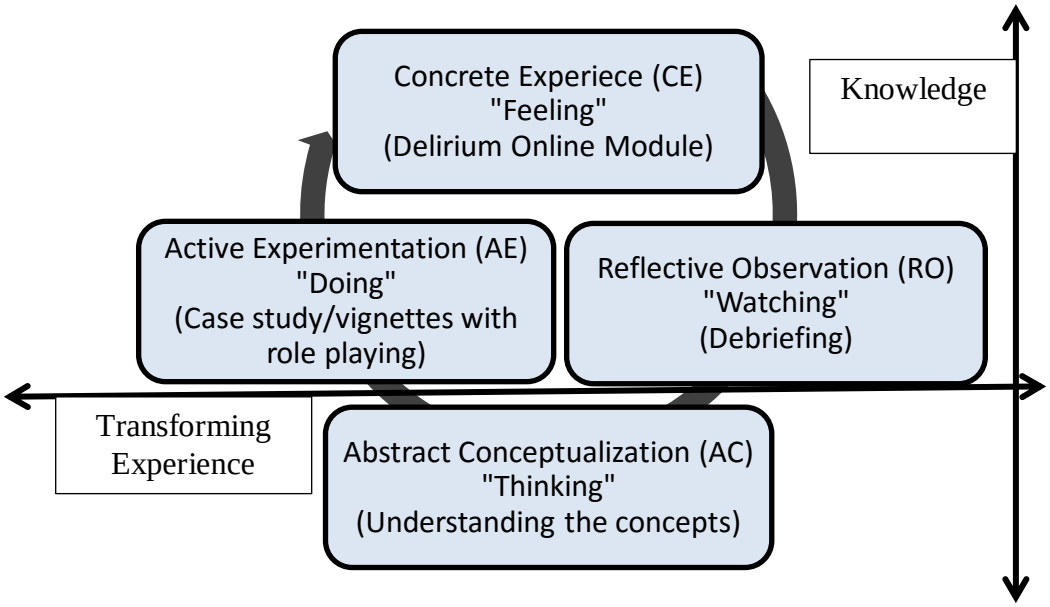


Figure 1. Recreated by author, adapted from Kolb's Experiential Learning Cycle (Kolb, 1999).

Research Design

This research study utilized an explanatory mixed method. It utilized a sequential technique where the researcher implemented the quantitative strand preceded by the qualitative strand during a certain phase of the research study (Creswell & Clark, 2011). (Appendix A) The quantitative component of the study was a randomized experimental design where the study participants were randomly assigned to a group that received the intervention (intervention or experiment group) or a comparison group that did not receive the intervention (control or non-treatment group). Data from each of the groups will be collected before and after the intervention. On the other hand, the qualitative data was collected utilizing purposive sampling where cases included were chosen taking into consideration those that most benefit the study (Polit & Beck, 2012) from the intervention group only. The qualitative data was used to explore

the experiences of the participants during the delirium education program. The qualitative data were collected utilizing semi-structured interview.

Rationale for Research Design

The focus of this research study was to explore the participants' experiences or perceptions of the developed delirium education program as it relates to knowledge of delirium and its association risk factors and self-confidence in identifying delirium and the associated risk factors. Through integrating both quantitative and qualitative data collection methods which was basically the mixed methods research design, a comprehensive approach to answering the research questions were met. The form of integration utilized was embedding data where the qualitative dataset collection into the quantitative data set after the educational intervention to aid in explaining results of the quantitative strand of the study. It further indicated how the participants experienced the intervention. The results provided meaningful explanation of the outcomes of the intervention.

Mixed methods research design provides more generalizable results, stronger evidence for the conclusion by merging and corroboration of findings, and offers the strengths of both quantitative and qualitative studies (Creswell, & Plano-Clark, 2011; Wisdom, Cavaleri, Onwuegbuzie, Green, 2012). Thus, it will provide a more holistic, comprehensive, and credible approach to the understanding of the phenomenon of interest (Venkatesh et al, 2013). Explanatory mixed method further supports the comprehensiveness of the study since in this type of mixed method, the qualitative data provided more detailed information regarding the quantitative results. The qualitative study was used to gather more insights and perspectives related to the results of the quantitative study.

Ethical Considerations

Recruitment and retention of subjects. The researcher recruited the participants of the study through email, flyer, and face-to-face recruitment (Appendices B, C). The recruitment process information included the overview of the study.

Protection of human subjects and ethical considerations. The study proposal was submitted to the school Institutional Review Boards (IRB) and hospital's Clinical Research Office for approval. Policies and procedures of the school's IRB and hospital's Clinical Research Office were reviewed by the researcher to ensure that the important points were taken into consideration. Once the study has been approved by the IRB (see Appendix D), the following procedures were initiated to protect human subjects of this study:

1. The researcher informed the prospective participants through email on the following:
    a. Purpose of the study
    b. Nature of the investigation
    c. Potential/anticipated benefits and risks if they choose to participate.
    d. Voluntary participation – that taking part of the research study is voluntary and withdrawal from the study anytime will not cause any penalty or loss of any benefits at work.
    e. Compensation –$5.00 coffee card per session based on their participation in the study. If the participant partially completed the study, partial compensation is received. The sessions are defined as follows: completion of demographic survey and pretest, online education module, simulation activity (one-on-one case study/vignette with role playing), post-test, and phone interview. For example, if a

participant completed only 3 sessions, he/she receives $15.00 however if all sessions were completed, he/she will receive $25.00.

f. Furthermore, it was emphasized that if they choose to participate in the study, they may obtain knowledge which may be beneficial to their clinical practice as nurses.

2. Participants who agreed to participate then signed the informed consent forms on paper (see Appendices E, F).
3. After the consent process, participants' identities were protected by identifying the data with specified codes which is only accessible to the researcher and put away in a locked file cabinet for safe-keeping located at the primary investigator's office. All experiences that each participant had during the study were kept confidential. Coded online pretests and posttests with no personal information maintain confidentiality. Each participant bears a code that was used for matching.
4. Monitoring the research to ensure participants' safety was the responsibility of the researcher.
5. There were appropriate additional safeguards to protect rights and welfare for special or vulnerable participants.

Phase I: Quantitative Phase

Setting. The site of this research study is the in a large community hospital in Southern California.

Population and sampling. The target population of this study consisted of all registered nurses working in the critical care units in the United States. The accessible population for this research study was the Coronary Care Unit (CCU) and Cardiovascular Intensive Care Unit

(CVICU) registered nurses working in a large community hospital in Southern, California (N=75). For the quantitative component of the study, once informed consents have been obtained, the participants were randomly assigned to a group that received the intervention (intervention or experiment group) or a comparison group that did not receive the intervention (control or non-treatment group). Along with being a registered nurse, the study participants met the following inclusion criteria: (1) having the ability to comprehend, read, and answer in English, (2) full-time/part-time (24-36 hours per week) who has worked at the hospital for a minimum of six months, (3) CCU and/or CVICU registered nurse, (4) has worked in the CCU and/or CVICU for at least six months, (4) works either day or night shift, and 5) has no education in delirium care for six months. The exclusion criteria for this research study include: (1) new graduate nurse, (2) registered nurse in leadership position, (4) float pool nurse, and (5) attendance in a recent (within six months) lecture, class, symposium on delirium.

Sample size. Literature reviewed indicated that the appropriate effect size of between-group difference in knowledge from baseline to post-test was .42 (f=.42) (Steginga et al., 2005). If we are to assume the same effect (f=.42 for between-group factor, f=.35 for within-subject factor, and within-between interaction, f=.22), a power analysis using G*Power (Faul, Erdfelder, Buchner, & Lang, 2007) showed that an analytical sample size of 30 will provide 0.73 power for the between groups main effect, 0.87 power for the within-subject factor, and 0.7 power for the within-between interaction effect, for a mixed model Analysis of Variance (ANOVA) with two groups and two waves of data collection and the following assumptions: correlation of 0.5 between measurements and alpha=0.05. Considering a 10% attrition rate over the 4-week intervention, 34 participants (17 per group) were needed for this intervention study.

Effectiveness of the intervention was supported by a significant Intervention by Time interaction effect on the outcome measures.

Data collection. The quantitative data collection utilized online survey software, SoGoSurvey. Both the intervention and control groups completed the online pre-tests consisting of the Demographic Survey Questionnaire, Nurses' Knowledge of Delirium (NKD), and Confidence Scale (C-Scale). The link to the online questionnaire were sent via email to all participants after consent to participate were obtained. The intervention group received the online Delirium Education after completing the pre-test and demographic survey then one-on-one case studies with role playing were scheduled. Three to four weeks after the completion of the pretests and demographic surveys and intervention, both intervention and control groups received the link to the online post-tests consisting of the NKD and C-Scale.

Demographic survey. The researcher developed the demographic survey (Appendix G) that was used to collect the demographic data. The demographic data online survey was used to describe the sample and understand the potential sources of bias such as age, sex, ethnicity, gender, work shift, job code, highest educational attainment, professional and clinical practice experience caring for patients with delirium.

Measurement tools.

Nursing knowledge. The 36-item Nurses' Knowledge of Delirium (NKD) by Hare et al. (2009) (see Appendix H) was used to assess the knowledge of the nurses in identifying delirium and the associated risk factors. Kuder–Richardson Formula 20 (KR-20) showed an internal consistency reliability co-efficients of 0.66 (n=26) and 0.80 (n=25) for Sections 3a and 3b of the questionnaire, respectively (Personal communication from Hare, 2015).

Self-confidence level. The 5-item confidence scale (C-Scale) created by O'Neill (as cited in Grundy, 1993) (see Appendix I). The C-scale contains statements that can be answered on a Likert-scale from 1 to 5, 1 being not at all certain, 2 as certain for only a few steps, 3 as fairly certain for a good number of steps, 4 as certain for almost all steps and 5 absolutely certain for all steps. Grundy (1993) conducted a study to determine C-scale's internal consistency, test-retest reliability and construct validity on nursing students to measure their confidence associate with performance of physical assessment. According to Grundy (1993), the C-Scale consistently demonstrated high internal consistency reliability throughout all periods of administration to students with a Cronbach's alpha ranging from .84 to .93 and to nurses with a Cronbach's alpha of .85. "The re-test reliabilities were high at 1 hour and 9 days retesting. The construct validity was supported by results of its use with both students and nurses" (Grundy, 1993, p. 8). In addition, the C-Scale had correlation coefficients with Confidence Visual Analogue Scale (C-VAS) from .58 to .80 and with the Confidence Verbal Descriptive Scale (C-VDS). In regards to the staff nurse C-scale scores, the correlation coefficients with C-VAS is .64 and with C-VDS is .77 (Grundy, 1993).

Intervention: Delirium education program. The delirium education program was developed by the researcher (Appendix J). Expert opinions were obtained to help ensure content validity of the delirium education program. A panel of three medical practitioners/professionals who were considered to be clinical experts in delirium reviewed the program objectives, content, comprehensiveness, method of instruction, and succinctness (see Appendices K, L). These content experts included two physicians: Neurologist, Critical Care Physician/Intensivist; and one nurse expert: Clinical Nurse Specialist/Educator Coordinator for Neurology and Critical Care Service Lines.

The delirium education program consisted of a 30-45-minute online learning module on delirium which included but was not limited to the following topics: definition, prevalence, key features, dementia vs delirium, etiology, associated risk factors, prevention, management, and use of the Nursing Delirium Screening Scale (NuDESC) (see Appendix M) by Gaudreau et al. (2005). After completion of the online module, the simulation activity (one-on-one case study/vignette with role playing) was conducted. Then the online post-tests were sent out after all the participants from the intervention group completed the intervention. The simulation activity enabled the participant to apply the content learned in the delirium online education program. Each simulation activity lasted about 15-20 minutes participants from the intervention group participated. Five standardized case vignettes developed by experts and one by the researcher were used (Fick, Hodo, Lawrence, & Inouye, 2007) (see Appendix N). These expert-developed vignettes were developed on five different hospitalized patients experiencing dementia, hypoactive delirium, hyperactive delirium, hyperactive DSD, and hypoactive DSD were used for case study with simulation. The overall agreement from all the four expert panelists who completed all case vignettes was 87% with a kappa of 0.69. "For identification of delirium, motoric subtype agreement was 100% with a kappa of 1.0" (Fick et al., 2007, p. 3-4).

The Nursing Delirium Screening Scale (Nu-DESC) developed by Gaudreau, Gagnon, Harel, Tremblay, and Roy (2005) is a five-item scale delirium screening instrument which is mainly based on the Confusion Rating Scale (Lutz et al., 2008). The components of the NuDESC scoring system are similar to the DSM-IV (Lutz et al., 2008). This quick and easy observational screening scale to recognize delirium does not require patient participation unlike other delirium screening scales (Lutz et al., 2008). The NuDESC has the sensitivity of .86 and a specificity of .87 for detecting delirium (Gaudreau et al., 2005).

Operationalization of variables. The responses to the demographic survey were categorical and classified based on their group membership, intervention vs control group. The demographic variables included information on the participants' demographics that include the following: age (ratio measurement), gender (nominal measurement), full-time or part-time (nominal measurement), work shift (nominal measurement), highest educational attainment (ordinal measurement), type of nurse (ordinal measurement), years of work experiences (ratio measurement), and experience in the delirium education program (nominal measurement).

The effect of the delirium education program on nurses' knowledge was measured by pre and post administration of the online NKD (Hare et al, 2008). Past research demonstrated strong reliability scores (Personal communication from Hare, 2015). The numbers of correct answers were summed up to obtain the individual composite scores for delirium knowledge. The effect of the delirium education program on nurses' confidence was after being measured by pre and post administration of the C-Scale (Grundy, 1993). This scale also demonstrated strong reliability and validity in other studies (Grundy 1993). For this scale, the individual scores will be added to obtain their composite scores for learner self-confidence.

Data analysis. The quantitative data analysis preceded the qualitative interviews. The independent variable for this study was the participation in the delirium education program. The dependent variables were scores of nurses' on the knowledge and self-confidence questionnaires pre and post intervention. The quantitative data was analyzed utilizing a mixed-model (between-subjects/ within-subjects) Analysis of Variance (ANOVA) to test whether there are significant effects of the between group subject factor (group membership: intervention vs control), within group subject Time factor (pre-intervention vs post-intervention scores), and the Group by Time interaction. Before performing the Mixed Model ANOVA, the demographic

characteristics and pretest results of the knowledge and self-confidence survey were compared to determine whether there are any variables that need to be controlled. The statistical procedure for analyzing the quantitative data was conducted with Statistical Package for Social Sciences (SPSS) version 21 and SoGoSurvey online software.

Field (2013) defined ANOVA as "a statistical procedure that used the F-ratio to test the overall fit of linear model. It is an overall test of whether group means differs" (p.870). ANOVA reduces the error of variance thus increasing the statistical power and accuracy in estimating the group effects (Field, 2013). With mixed model ANOVA, several assumptions should be met to ensure validity of ANOVA results interpretation. These following assumptions were met in this research study: 1) exclusivity of the groups; 2) homogeneity of variance (variance of the groups should be equivalent); 3) dependent variable should be normally distributed.

Phase II: Qualitative Phase

Sampling. Purposive sampling procedure involves sampling from those who will provide the rich cases (Polit, & Beck, 2012). In this research study, purposive sampling involved taking information rich cases from the intervention group whose perceptions and experiences of the delirium education program provided further insights of the phenomenon of interest. The information rich cases that were selected pertained to those cases where the participants from the intervention group obtained the lowest knowledge pretest scores (below 50%) with improved post-test scores (increase in score by about 50%); pretest knowledge score of 70% or better to low post test score (below 50%); minimal (5-10%) increase or no change in knowledge and self-confidence scores; and 4) improved self-confidence scores from pretest to posttest (increase in score by 20% or better). Self-confidence scores ranging from 5-11 is considered low, 12-18 moderate, and 19-25, high (Personal communication from Grundy, 2015).

These cases were useful due to the fact that they provided important insights of the phenomenon of interest being studied. Phenomenological qualitative research studies in human science consider the use of at least three participants (Englander, 2012; Giorgi, 2009). In this case, the qualitative portion of this study utilized a sample size of around 6 participants from the intervention group.

Data Collection. A descriptive phenomenological inquiry was used for the qualitative portion of this study to describe and gain a deeper understanding of the lived experiences and perspectives of the nurses related to their experiences of the delirium education program as it relates to the identification of delirium and the associated risk factors. It involves "direct exploration analysis and description of particular phenomenon as free as possible from unexamined presuppositions arising at maximum intuitive presentation" (Streubert & Carpenter, 2011, p. 81). It further provides a highly valuable and effective way to investigate the phenomenon of interest being studied.

Interview. During Phase II, the Qualitative Phase, the participants who were chosen from the intervention group to participate in the qualitative portion of the study underwent semi-structured interviews. This type of interview format allowed the researcher to ask participants specific questions that focus on various aspects of the delirium education program as well as those related to identifying delirium and the associated risk factors as it relates to their scores. Follow-up questions based on the participants' responses were also included to provide further insights and clarification of responses. Semi-structured interviews allowed participants to fully describe their experiences and share their stories. It was the best way to gather experiential material that helped in developing a richer and deeper understanding of the phenomenon of interest being studied. Participants were scheduled either through email or over the phone. Due

to time and logistic constraints, the researcher conducted phone interviews which lasted about 10-30 minutes. The researcher used a digital tape recorder with a back-up second digital recorder. Whenever the researcher needs clarification of the response of the participant, a more directive style of questioning was used.

The researcher utilized a journal where notes or entries were done after each interview to ensure accuracy of transcription. These notes reflected the following: researcher's own interview skills, opinions notes on reflections that could have influenced the course or content of the interview process. The researcher maintained an objective stance during the interview. During the interview process, the researcher built rapport and candor to acquire truthful and valuable responses from the participants. The researcher paused and reflected after the first interview to ensure enough data are gathered. After the first interview, the researchers provided a summary of the interview and thanked the participant. To allow for member check, the participants were contacted for a follow-up meeting for them to comment on the themes and findings of the study. The entire digital audio file was uploaded to the computer and the original file was deleted after transcription has been completed.

Setting. The semi-structured interview over the phone was conducted at a comfortable, quiet undisturbed private location chosen by the participant. Each of the settings (researcher and participant) has a closed door where only the researcher and the participant are present in the room. The participant was assured that the researcher was alone in the room at the time of interview, the doors were closed and no one can overhear the interview. This helped maintain the participants' right to privacy and confidentiality. A written consent for the interview was obtained after the recruitment process. The researcher prior to the start of the interview notified the participant when the digital audio tape is activated and when they are turned off.

Interview questions. The interview questions (see Appendix O) were developed by the researcher following the guidelines in writing qualitative study questions especially the content, wording, and response strategy (Cooper & Schindler, 2011). There were fourteen open-ended questions. These questions were pretested or field tested by obtaining informal reviews from colleagues (Cooper & Schindler, 2011) to assess the appropriateness and any issues or difficulties it might pose to the participants during the interview. The researcher chose a semi-structured phone interview as the strategy of data collection for the qualitative component of this study because aside from being inexpensive and quick turnaround, it was also good for measuring attitudes and eliciting responses from the participants.

Data Analysis. All interviews were transcribed verbatim by the researcher in a private room with a closed door while wearing headphones. The researcher transcribed, read and proof-read the data several times to become familiarize with the ideas, opinions and identify relevant themes. Colaizzi's (1978) 7-step method of Phenomenological Analysis was utilized to analyze the qualitative data of this study (see Appendix P). The 7 steps are: transcription of data, extraction of relevant phrases/statements, formulation of meanings, organization of themes, exhaustion of descriptions, identification of fundamental structure and validation or review by participants. This method allowed the researcher to apply thematic analysis to the phenomenon of interest. It is important at this point to mention that the researcher was able to identify biases, assumptions, and preconceptions to the phenomenon so as to enable bracketing. Bracketing provides the researcher the means of reducing the chance of imposing pre-existing assumptions, biases, or preconceptions on the study which may influence the outcomes. According to Streubert and Carpenter (2011), bracketing and transparency are critical to the success of the data analysis.

The transcription of the data will be done verbatim. The researcher will transcribe, read and proof-read the data several times to familiarize with the ideas, opinions and identify relevant themes. It is expected that for the researcher to become part and get immersed in the data and obtain more understanding of the experiences. Journal entries will be also used in the data analysis as this can provide additional information that may not be in the interview transcript such as non-verbal cues, emotions or feelings related to the phenomenon of interest. A combination of manual coding and the use of software, MAXQDA[12], were used for coding and indexing of data. Once data have been sorted out, thematic analysis was completed. A constant comparative analysis was done during thematic analysis which aided in identifying the appropriate themes or essences of the study. The themes were identified based on the following criteria: reflective of the study's purpose, data thoroughness, exclusivity which means that only a piece of data can only fit into one category, and theoretically congruent.

Trustworthiness. To ensure trustworthiness of this qualitative component of this study, several measures were taken into consideration (Glesne, 2012; Polit & Beck, 2012; Streubert & Carpenter, 2011).

Credibility. To maintain the study's credibility, the following were undertaken:

a. Instituting bracketing entailed the researcher to identify his/her biases, assumptions, and preconceptions to the phenomenon that provided a means of reducing the chance of imposing pre-existing assumptions, biases, or preconceptions on the study. Participants' perspectives were obtained not that of the researcher's.
b. The use of method triangulation increased the study's credibility as well. Methodological triangulation is a research strategy utilized to improve reliability

and validity of data by using combination of more than one research strategy in a single investigation (Streubert & Carpenter, 2011). Thus, this research study utilized both quantitative and qualitative research methods or mixed methods, a form of method triangulation, that provided an unbiased multidimensional perspective of the phenomenon of interest.

c. The use of iterative questioning in data collection dialogues which entails the use of probes to elicit detailed information and iterative questioning was used.

d. Credibility was maintained with the member checking as describe previously.

Transferability. Ensuring trustworthiness and external validity include transferability.

Dependability. Reliability issues lie on the study's dependability. This study employed techniques or methods that will work in the same context with the same methods and the same participants when repeated and finally, obtain similar results.

Confirmability. Audit trail was done. The researcher recorded of activities throughout the qualitative research process.

Summary

The Experiential Learning Theory by Kolb provided a significant framework for this research study. The sequential explanatory mixed method allowed for the opportunity to investigate the effects of the delirium education program on the knowledge and self-confidence of nurses in the identification of delirium and its associated risk factors. Furthermore, this research design facilitated the exploration of the nurses' account of their experiences of the delirium education program. The data obtained from initial phase, quantitative phase, informed decisions regarding the sampling and interview questions in the second phase, qualitative phase.

The result of the online survey was further supported by the follow-up qualitative data collection to provide better understanding of the quantitative outcomes and meaningful results.

Chapter 4

Results

Findings of Phase I: Quantitative Phase

Data Collection Processes and Results

Recruitment of the participants for the survey was via the hospital's email account, flyer, and face-to-face. Potential participants in this study included 75 full-time/part-time registered nurses that worked in the CCU and /or CVICU in a large community hospital in Southern, California (N=75) for a minimum of six months. A number of the participants indicated their interest in joining the study via email and the rest during the face-to-face recruitment process. After successful recruitment of 34 participants, the researcher met with each participant to start the consent process and address any question that they have. Participants were then randomly assigned to either the intervention or control group after consent was obtained. Then, they were sent a SoGoSurvey link to complete the online demographic and pre-test (Time 1) surveys. Two respondents (6%), one from each group (intervention, control) dropped out of the study. After finishing the online survey, the intervention group, 17 participants, received the educational intervention, delirium education program. The participants informed the researcher on their availability for the simulation activity. Initially, the researcher's plan was to do case studies with high fidelity simulation in groups of around 4-5 nurses however, due to participants' preference and availability, this plan was unable to be initiated. The participants requested to complete one-on-one case study/vignette with role playing with the researcher. This occurred at two weeks after completion of the pretest surveys. After the intervention group completed the simulation activity which is 3-4 weeks after the completion of the pretests and demographic surveys both

intervention and control groups received the link to the online post-tests (Time 2) consisting of the NKD and C-Scale.

Description of the Participants

The survey targeted nurses who work in the CCU and/or CVICU of a large community hospital in Southern California (N=75). There were 16 participants in the intervention group and 16 participants in the control group (N=32) who completed the pretest and post-test surveys. Considering that there was a 6% (2 out of 34) attrition rate over the 4-week intervention, this is acceptable due to the fact that the computed attrition rate is 10% (4 out of 34) of the were analytical sample size for the study. Of the 32 participants, majority were White alone (59.4%), 25% reported being Asian, 6.3% Native Hawaiian, 6.3% were two or more races, and 3.1%, Hispanic or Latino. The mean participant age fall within the range of 30 to less than 40 years of age (38.1). Majority of the participants are female (96.9%). A few number of participants reported having their associate degree at 4%, master's degree at 25%, and majority with a bachelor's degree at 62.5%. With regards to the participants' years of experience as a nurse, the data showed that an equal number of participants (25%) worked from 2 years to less than 5 years, 5 years to less than 10 years, and greater than or equal to 15 years. Forty-four percent of the nurses worked in critical care for less than 5 years, 25% for 5 to less than 10 years, 22% for 10 to less than 15 years, and 9% for greater than or equal to 15 years. A vast majority of the nurses (87.5%) worked in both the CCU and CVICU and the rest working in CCU alone (12.5%). A greater number of the participants worked full-time (65.6%) than part-time (34.4%). Seventy-two percent of the participants indicated that they work day shift and the remaining at night shift. Participants stated belonging to clinical nurse I (65.6%), clinical nurse II (15.63%),

clinical nurse III (9.4%), and clinical nurse IV (9.4%). Lastly, 96.9% reported having experience taking care of patients with delirium (see Appendices Q, R).

Effects of the Educational Intervention on Knowledge and Self-Confidence

The independent variable for this study was the participation in the delirium education program. The dependent variables were scores of nurses' on the knowledge and self-confidence questionnaires pre and post intervention. The quantitative data was analyzed utilizing a mixed-model (between-subjects/ within-subjects) Analysis of Variance (ANOVA) to test whether there are significant effects of the between group subject factor (group membership: intervention vs control), within group subject Time factor (pre-intervention vs post-intervention scores), and the Group by Time interaction. Data was analyzed for the study's two hypotheses separately.

A total of 32 participants completed the NKD and C-scale pre-tests and posttests. The Cronbach's alpha for the NKD was.740 to .799 and for C-scale was .948 to .964 throughout all periods of administration to participants. Data screening and assumption testing were done by splitting the file by group. These procedures were done in each of the two groups separately. Although data screening procedures detected three outliers in the data utilizing box plots by group, they were not removed from the statistical analysis as the sample was small. Assessment of skewness and kurtosis values to include histograms with bell curve overlay were done to establish normality (Field, 2013). Moreover, sphericity and homogeneity of variance-covariance matrices and homogeneity of variance were also met. The data generated was used to evaluate both hypotheses one "a" and one "b". Thus, data analysis proceeded with 32 cases (intervention n=16, control n=16) without making statistical adjustments to the data.

Research question one addressed the effect of the DEP on critical nurses' knowledge and self-confidence in identifying delirium and the associated risk factors. Specifically, hypothesis

one “a” stated that nurses who participate in the DEP will have a greater improvement in knowledge in identifying delirium and the associated risk factors post intervention compared to nurses who do not participate in the DEP. Hypotheses one “b” stated that nurses who participate in the DEP will have a greater improvement in self-confidence in identifying delirium and the associated risk factors post intervention compared to nurses who do not participate in the DEP. To test these hypotheses, data were submitted to a series of mixed-model ANOVAs to answer the first research question in which educational intervention (intervention, no intervention) served as the between-subjects factor and time (pretest, posttest) served as the within-subjects factor. Both knowledge of delirium and self-confidence served as dependent variable in each of the analyses respectively. Results revealed a statistically significant group x time interaction for self-confidence, $F_{(1, 30)} = 16.22$, $p < .001$, $\eta^2_p = .351$. Also, the time main effect was statistically significant for self-confidence, $F_{(1, 30)} = 17.07$, $p < .001$, $\eta^2_p = .363$ but not group, $F_{(1, 30)} = 17.07$, $p = .34$, $\eta^2_p = .030$. The simple main effects and simple contrasts of the significant group x time interaction for self-confidence as well as the time main effect are interpreted more closely next.

The simple main effects results of self-confidence within group demonstrated that the intervention group demonstrated significantly increased self-confidence from pretest to posttest, and this effect was large ($\eta^2_p = .526$). Simple contrasts within time showed that, while there were no significant differences in self-confidence between the groups at pretest, at posttest the intervention group reported significantly higher self-confidence when compared to the control group, and that this effect was large ($\eta^2_p = .166$). The main effect for time on self-confidence revealed that participants generally reported increased self-confidence at pretest ($M = 15.09$, $SD = 4.18$) when compared to posttest ($M = 17.56$, $SD = 4.67$).

With respect to knowledge, results suggested that there were no statistically significant effects: group x time interaction, $F_{(1, 30)} = .38$, $p = .57$, $\eta^2_p = .011$; time main effect, $F_{(1, 30)} = .81$, $p = .38$, $\eta^2_p = .026$; and the group main effect, $F_{(1,30)} = .005$, $p = .94$, $\eta^2_p = .001$. Descriptive statistics for the sample by group and time is presented in Table 4.

Table 4

Descriptive Statistics by Time and Group for Each Variable

Variable/ Group	Pretest		Posttest	
	M	*SD*	*M*	*SD*
Self-Confidence				
Intervention	14.56	4.56	19.44	3.18
Control	15.62	3.84	15.69	5.23
Total	15.09	4.184	17.56	4.67
Knowledge				
Intervention	28.18	4.97	29.31	5.07
Control	28.53	2.94	28.78	3.45
Total	28.35	4.02	29.04	4.27

Section Summary

Thirty-two nurses participated in Phase I, quantitative strand of the study. For self-confidence, results revealed a statistically significant group x time interaction and time main effect was statistically significant for self-confidence. The group x time interaction, group main effect, and time main effect were not significant for knowledge.

Findings of Phase II: Qualitative Phase

Description of Participants

A total of 6 nurses from the intervention group were interviewed. The individual participant demographic profile is presented in Appendix S). Participants were provided with pseudonyms, RN1, RN2, RN3, RN4, RN5, and RN6. All of the participants were females and majority belongs to the 40 to less than 50 years of age range. Only 1 of the 6 worked in the CCU alone, the rest worked in both CCU and CVICU. Two of them completed a master's degree and the remaining, bachelor's degree. All of the 6 participants noted that they have experience caring for patients with delirium. Majority of them worked in critical care for more than 5 years, only but one worked less than 5 years. Five of the 6 participants worked day shift. As mentioned in an earlier chapter, the rationale for choosing these participants for the qualitative strand of this research study were: 1) Low pretest knowledge score (below 50%) to an improved posttest knowledge score (increase in score by about 50%); 2) pretest knowledge score of 70% or better to low post test score (below 50%); 3) minimal (5-10%) increase or no change in knowledge and self-confidence scores; and 4) improved self-confidence scores from pretest to posttest (increase in score by 20% or better).

Data Collection Processes and Results

The qualitative research question was focused on determining the experiences or perceptions of the nurses on the delirium education program. The qualitative semi-structured interview was designed to ask questions to the participants to obtain answers to the research question. Colaizzi's (1978) 7-step method of phenomenological analysis was utilized to analyze the qualitative data of this study (see Appendix P). The following steps were employed:

Step 1: Transcription

The researcher transcribed each interview from the digital audio recorder to a Microsoft Word document with an appropriate level of detail. Transcripts were double-checked for accuracy by the researcher through reading and proof-reading the data several times thus becoming familiarized with the ideas, opinions and identify relevant themes.

Step 2: Extracting significant statements/generating initial codes

Transcripts were coded and indexed manually. These transcripts were loaded into a computer software program, MAXQDA[12] to further complete the data coding and indexing process (Appendix T). An iterative approach was used to analyze data. The transcripts were reviewed for fundamental meaning units. Initial ideas/codes were noted during this process. Statement or phrases that directly pertain to the phenomena were extracted. All data were given equal attention. Thorough and comprehensive coding process was done. Researcher's notes or journal entries were used as this provided additional information that may not be in the interview transcript such as non-verbal emotions or feelings related to the phenomenon of interest. It is important at this point to mention that the researcher was able to identify biases, assumptions, and preconceptions to the phenomenon so as to enable bracketing. Bracketing provided the researcher the means of reducing the chance of imposing pre-existing assumptions, biases, or preconceptions on the study which may influence the outcomes.

The 6 interviews produced around 2-4 pages of transcription with a total of 6875 words. With the use of MAXQDA[12] coding, the 6 interviews resulted in 228 significant words, statements, or phrases related to the participant's experience of the intervention which is the delirium education program and its effects on their knowledge and confidence in identifying delirium and the associated risk factors.

Step 3: Formulation of meanings or collation or aggregation of formulated meanings

With the use of both manual and the computer software, MAXQDA[12], each of the 222 words, statements, and phrases were coded. The codes were again reviewed to compare the extracts across participants. Codes were then reclassified and combined, if necessary.

Step 4: Categories, cluster of themes and themes

In every subsequent iteration of data analysis, relevant phrases and descriptions were compared and contrasted for the purpose of identifying the appropriate themes or essences of the study. The themes were identified based on the following criteria: reflective of the study's purpose, data thoroughness, exclusivity which means that only a piece of data can only fit into one category, and theoretically congruent. Categories were grouped into main themes taking into consideration the purpose of the research study.

Step 5: Exhaustive description of the phenomena/review of themes

In this step, the researcher checked the themes against each other as well as the original data. They were also checked in relation to coded extracts. Each theme was reviewed again against the collated data extracts, verified and defined. At this point, the thematic 'map' (Appendix U) was generated to further aid in the analysis.

Step 6: Identification of fundamental structure

The researcher at this point continued analysis of the themes was done to generate and refine the specifics of each theme. Clear definitions and specific names for the themes were then created. The researcher ensured that the analysis and the data matched each other and produced a well-organized story about the phenomenon of interest.

Step 7: Validation of exhaustive description

The researcher was able to bring back to the 6 participants the results of the findings of the study to validate the findings. Individually the researcher discussed the findings with them face-to-face showing them a written copy of the findings. All of the participants stated that the themes did represent their experiences. This step of the data analysis allowed for member checking which impacts the credibility of the study.

Individual Case Studies

Participants' demographics were individually considered to better provide for more in-depth analysis of their lived experiences as it relates to the effect of DEP on their knowledge and self-confidence.

Participant RN1. Participant RN 1 is a female nurse, age 30 to <40 years old, who works as a full time employee, with a bachelor's degree, and about 5 to <10 years of experience in the critical care unit. Her self-confidence scores showed a 20% improvement from a pretest score to post-test score. It is important to point out that although her self-confidence scores in both the pre-test and the posttest were high, she scored herself in the posttest with the highest score anybody can get which is 25. Her knowledge scores showed minimal improvement (4%) with pretest and post-test scores of 70% or better. Although she showed only a minimal improvement in knowledge scores, excerpts from the interview showed that she acknowledged an improvement in knowledge. Below are examples of the quotes.

"I felt that I learned a lot of different things…after viewing the PowerPoint and doing the case studies it kinda help to break it down better and easier."

"I think it really helped me a lot in understanding delirium."

"I did not know that, I thought … why will that be at risk for delirium? After I learned from your education program, it actually is a risk for delirium. But I am not sure why I answered "true" it should be "false". It does not reduce the risk, it actually increases the risk.

"I felt that the information given on the PowerPoint...it was interesting that I took the pretest that I did not know like the urinary catheter, also the hip replacement question, why would that be and these are the things that didn't know."

Participant RN2. Participant RN 2 is a female nurse, age 40 to <50 years old, who works as a part-time employee, with a bachelor's degree, and about 15 years of experience in the critical care unit. Her knowledge scores showed remarkable improvement (almost 40%) with a pretest score of below 50% to 70% or better in the posttest. Her self-confidence scores showed an almost 50% improvement from a pretest score of 12% to a posttest score of 60%. Her self-confidence score was low at pretest and at posttest, at moderate level. The great improvement in her scores can be further explained by the quotes below where she reflected and looked into detailed information related to what she has learned from the DEP.

"I actually think patients with diabetes is at higher risk for delirium because they end up with electrolyte imbalances."

"Well….. Initially, I don't think it can contribute to delirium; it is just more of a fall risk but after the DEP, I realized it could be a risk factor."

Participant RN3. Participant RN 3 is another female nurse, age 40 to <50 years old, who works as a part- time employee, with a master's degree, and about 10-15 years of experience in the critical care unit. Her knowledge scores showed minimal improvement (8%) with pretest and post-test scores of 70% or better. Her self-confidence scores showed a great improvement of about 28% from a low pretest score to a moderate post-test score. Although her knowledge scores showed a minimal improvement, excerpts from the interview showed that RN3 discussed,

analyzed detailed information about delirium related to the information discussed in the DEP and applied those concepts at the workplace. Below are examples.

"Patients with delirium have fluctuation between orientation and disorientation. I am not sure why I answered false."

"Well… not all patients who are lethargic and difficult to rouse has delirium. I guess we cannot generalize them."

"They could be sedated that is why they are difficult to rouse and are lethargic. Three days ago I just had a patient who was extubated, rather than labeling her crazy. Does she have dementia? Is it anxiety? Is it delirium? I don't want treat her heart rate because it is elevated because her beta blocker wasn't worker. Is it anxiety or delirium?"

Participant RN4. Participant RN 4 is a female nurse, age 40 to <50 years old, who works as a full time employee, with a bachelor's degree, and about 10 to <15 years of experience in the critical care unit. Her knowledge scores showed minimal improvement (7%) with pretest and post-test scores of 70% or better. Although her self-confidence scores showed only a 4% improvement from pretest score to post-test score, it is worth noting that she was initially moderate in self-confidence and post intervention, she scored herself with high confidence. Although there was minimal improvement in the knowledge score, quotes from the interview indicated that RN4 not only learned concepts from the DEP but also analyzed and applied the concepts learned. Examples of these quotes are below.

"I think they do because their blood sugars are up and down, very labile and if they don't have a very good control of diabetes definitely their blood sugars fluctuations definitely affecting their mental status at that time and I think that will put them at higher risk for delirium. You know they have neuropathy and that will decrease their sensation as well that will … I think.. it will add on to the risk for delirium."

She even further discussed delirium in relation to genetics in the quote below.

"I think genetic is always playing a part in any disease. I am not sure the prevalent. I think it does have an effect."

Participant RN5. Participant RN 5 is a female nurse, age 40 to <50 years old, who works as a full time employee, with a bachelor's degree, and about 10 to <15 years of experience in the critical care unit. Her knowledge scores showed a pretest of 70% or better however the post-test score was below 50%. Her self-confidence scores did not change from pretest to posttest which is high. RN5 was the participant who had some technical difficulties. It appeared that based on the interview, she did not intend to skip questions which could be the reason why she had a 70% or better pretest knowledge score and a posttest score below 50%.

"Yes, I was using my cell phone and I had some technical difficulties. I cannot use internet explorer on your survey, so I went to Google Chrome.

RN 5 discussed some details about delirium, analyzed some concepts and gave positive comments about the program related to increase in knowledge. Excerpts from the interview that showed are below.

"I think it does. Based on the PowerPoint, it actually talked about depression mimicking delirium.

"… our elderly patients are in a lot of medications, the more medications, the more they end up with delirium"

"…males are more prone to develop delirium, that is what I have learned from your education program."

"It improved my skills and confidence"

"It did improve my confidence in recognizing delirium."

Participant RN6. Participant RN 6 is again a female nurse, age 30 to <40 years old, who works as a part time employee, with a master's degree, and about less than 5 years of experience in the critical care unit. Her knowledge scores showed minimal improvement (9%) with pretest and post-test scores of 70% or better. Her self-confidence scores showed a great improvement of about 48% from a moderate pretest score to a high post-test score. It is important to point out that

she scored herself in the posttest with the highest score anybody can get which is 25. RN 6 showed great improvement in self-confidence scores which were discussed later. However, with regards to the knowledge scores, although her scores showed minimal improvement after the intervention, a quote from the interview showed that indicated the RN6 applied concepts of delirium to understand a patient that she had. Below is the quote.

"I had a patient had a gastrointestinal surgery…Overall, you know, he seemed that a pretty healthy guy. When I got a report in the morning, the nurse told me that he was kind of rude or cranky…When I went in to assess her and looked more closely, he was very delirious..."

Essences, Themes, and Subthemes

Based on the qualitative data analysis, two main findings were identified. First, all participants expressed a positive outlook toward the educational intervention, with only one recommending improvements. Second, the following five themes permeate the lived experiences of these nurses of the delirium education program: (1) participants' outlook about the delirium education program; (2) DEP is high quality; (3) awareness or knowledge of delirium comes with DEP; (4) confidence in recognizing delirium stems from DEP; and 5) delirium: frequent or not?.

Each of these findings is presented in detail in the following sections and representative extracts from the data set are provided.

Each of these findings is presented in detail in the following sections and representative extracts from the data set are provided.

Theme Number One: Participants' Outlook About the DEP

As the participants were sharing their experiences of the DEP, one of the main themes that emerged is the participants' outlook about the DEP. All the six participants perceived the educational intervention on delirium in an overwhelmingly positive light, stating that the intervention increased their knowledge and understanding of delirium as well as their confidence

in assessing delirium. Several participants expressed that they often confused substance abuse (e.g. alcohol withdrawal, sleeping pill) and other conditions as delirium. Upon reflection on their posttest performance, many participants wondered why they initially responded to certain knowledge questions regarding delirium in the way they initially had. They conveyed that the delirium educational intervention helped clarify their confusion and provided them with essential information to better identify or recognize, diagnose and treat patients exhibiting symptoms of delirium. Below are some representative quotes from participants.

"Actually I liked it … I think going over the case study was great. It was clear and direct. I feel that the PowerPoint that you put together and then the case studies, that was great." (RN1)

"Yes, the delirium education and case studies were helpful in educating me more about my patients with delirium. … I think it simplified things and helped me understand delirium better." (RN2)

"Well, I liked it." (RN3)

"I think the powerpoint is pretty clear. Gave me very good tips. I feel it is a lot less confusing with regards to the tool unlike what we used here, the CAM-ICU which is very confusing. I think it is totally usable. Ahmm.. I would definitely use it at our X hospital as well … There are some parts that you can study on your own which is good. And you provide case study that answered the questions that I have after the powerpoint. I think that fit me well." (RN4)

"I think it is an excellent program. It improved my skills and confidence. ..It talks about background, history, assessment, treatment and case studies. ..I think it is a very good program, very excellent program …I like the case studies. I like the details about delirium and dementia. A lot of details are very great in the powerpoint. " (RN5)

"It was concise and relevant and very applicable." (RN6)

As evidenced by these participant experiences, the delirium educational intervention was not only well-received but it was also informational, instructive, and convenient. Participants especially enjoyed the detail and clarity of the PowerPoint presentation as well as the case studies. Participant RN4 even compared the intervention to the program currently in place at

his/her workplace, indicating that the delirium educational intervention was superior compared to the confusing one offered by her employer.

Theme Number Two: DEP is high quality

Another main theme that emerged is: perceptions of the quality of the DEP. Participants felt that the quality of the delirium educational intervention was high. They expressed that the intervention included the right mix of information and that the information was pertinent and did not overlap too much with information they already knew. In analyzing the perceptions of the quality of the DEP, four subthemes were developed: 1) high quality DEP; 2) type of educational intervention; 3) use of NuDESC tool in clinical practice; and c) mandating the DEP for all nurses.

Subtheme: DEP is concise, relevant and effective. This subtheme materialized when five out of the six participants indicated that the DEP was of high quality related to it being concise, relevant, and effective. Excerpts to show evidence of this subtheme are below.

"There was nothing missing. It actually…ah… was very concise though. And I was surprised in a good way. I didn't think … that it went too far into things that I already knew. I thought it was all very relevant, very continuing education for our level of expertise." (RN6)

"It made sense; it reminds me of what I deal everyday … It was very educational, simple, clear and direct to the point." (RN2)

"It is a quick guide…It was very effective." (RN3)

"I don't think you need to improve it but I think it would be great if we could just actually put it into practice, start using it and also use the tool." (RN1)

"After I reviewed your course, your delirium PowerPoint and all study cases, it gave me… a better understanding about delirium… things I have forgotten over the time. Your PowerPoint explains the psychosocial, family contact and things like that. We need to find out details about the background, the family who are close to them, who are familiar with them." (RN5)

However, one participant had one suggestion for improvement, albeit she still believed the quality of the program to be exceptional.

"The questions in the pre and posttest, the wording, was a little bit confusing, it took me a little bit of time. Other than that there is nothing I would like to change to the delirium education program. It was concise and relevant and very applicable." (RN1)

Subtheme: DEP helps with busy schedules. During the interviews, all of the participants expressed their thoughts related to the type(s) of educational intervention that they think was (were) effective. Participants appreciated the ease and convenience with which the intervention was delivered, expressing that unlike traditional modes of delivery, online delivery fit their busy schedules far better. Furthermore, they also have positive comments about adding case studies with role playing to the PowerPoint or didactic portion of the education program. Below are the excerpts that support this subtheme.

"I loved that it is an online training mixed with case studies something like hands on." (RN2)

"…think I also like that the program is online." (RN4)

"…with online convenience with technology and with my busy schedule, now with the online program with it fits my busy schedule. The online course is very good in explaining all detailed information about delirium." (RN 5)

"I actually liked the online program because I can do it when I am focused…ahm…but you know.. I was able to do it on my own pace. I didn't have to…ahm… I think in person, you know I might have lost interest…might or have to go out at that time when I didn't want to…it was really nice it was online." (RN6)

"I felt like that the one that we learned and after viewing the PowerPoint and doing the case studies it kinda help to break it down better and easier. I feel that the PowerPoint that you put together and then the case studies, that was great." (RN1)
"…liked the case studies too because it provided me with better understanding… the delirium education and case studies were helpful in educating me more about my patients with delirium." (RN2)

"…the case studies were really very helpful with regards to what I should be looking for." (RN3)

"And you provide case study that answered the questions that I have after the PowerPoint." (RN4)

"The case studies are very interesting." (RN5)

"…the case studies were great. … The case studies to use the tool, it removes the guesswork." (RN6)

Subtheme: NuDESC is a user-friendly tool. This subtheme surfaced when all the participants articulated their thoughts about the tool used in the DEP to assess delirium, the NuDESC tool. They all felt that the tool is very useful and effective in diagnosing delirium and is very easy to use. The following exemplifies this subtheme.

"But I just want to see it…involved…or come to fruition into our unit specially the tool. That we will be using that scoring system because it will really help us." (RN1)

"I think the more I will use the tool that was used in the program, it will be easier for me at the bedside to assess delirium. The tool was very easy and quick to use. I like the algorithm or the NuDESC tool. So using a tool would be helpful in our unit." (RN2)

"I like that one (referring to the NuDESC tool) because it is user friendly. It is a quick guide... This one is much better, more precise in categorizing the patient and determining whether the patient has dementia or delirium. The criteria are more specific and better tool to utilize. I can apply it right away … The tool was easy to use. It is an important tool to apply." (RN3)

"I feel it is a lot less confusing with regards to the tool unlike what we used here, the CAM-ICU which is very confusing. I think it is totally usable." (RN4)

"The tool was easy to use." (RN5)

"Because the other tools that I looked at, they are pretty long ah…especially if the patient have a language barrier or they are hard of hearing, things like that. It (NuDESC tool) kind of solidifies the assessment portion." (RN6)

Subtheme: Mandating DEP for all nurses. Several of the participants expressed that the program was so informative and instructive that they felt that all nurses in their unit should be required to undergo the training.

"I think this delirium education should be assigned or mandated to all nurses… think all nursing staff should get the education, not just us who went to through this study but also other nurses in the unit or even the entire hospital." (RN2)

"I think what you did, we can all learn from it. I think it is going to be helpful to all of us. I think all nurses should go through the education you developed." (RN5)

"I think we just need to bring the PowerPoint to our X hospital nurses so they can learn. I think it has very detailed information that nurses can learn about delirium." (RN4)

The fact that some participants felt so strongly about the utility of the delirium educational intervention to express that it should be required to be taken by all nurses in their workplace speaks to the relevance, high quality, and need for the intervention, especially given the confusion some participants expressed about delirium diagnosis and symptoms.

Theme Number Three: Awareness or Knowledge Comes With DEP

This main theme that surfaced is related to awareness or knowledge of delirium. Participants spoke at length about their increased awareness or knowledge of delirium symptoms as a result of the educational intervention. RN1 expressed in different occasions of the impact of the delirium education program on her knowledge or awareness of different aspects of delirium. The following examples demonstrate this main theme:

"I definitely feel more comfortable because before I felt like I had some comfort with it but the confusion lies within all the different scoring mechanisms, what scoring mechanisms are you using, …you know… how are we diagnosing if this patient has delirium. I felt… I feel now that I feel much better." (RN1)

"I felt that I learned a lot of different things. You know, there is so many different scoring, tests, and mechanisms that I felt like that the one that we learned and after viewing the PowerPoint and doing the case studies it kinda help to break it down better and easier." (RN1)

"I felt that the information given on the PowerPoint...it was interesting that I took the pretest that I did not know like the urinary catheter, also the hip replacement question, why would that be and these are the things that didn't know." (RN1)

"The program made me more aware of the things that I need to watch out for to recognize delirium. I hope I can help my patients more by recognizing delirium early. WE tend to say "sun downing" but I guess it is really delirium." (RN2)

"I didn't really know what to expect because my first experience with delirium, any kind of delirium was guidance is CAM-ICU. I am a little bit traumatized a little bit. So this is like…seen

this totally an eye opener for me, this is something that is doable instead of confusing everybody." (RN4)

"…your delirium PowerPoint and all study cases, it gave me… a better understanding about delirium…" (RN5)

"No, dementia is definitely a risk for delirium but not everyone with dementia develops delirium." (RN6)

All six participants expressed that the way they experience and engage with patients who suffer from delirium is different because of the educational intervention. As a result, they all felt that the intervention increased their awareness of the symptoms and how to better treat these patients.

Theme Number Four: Confidence in Recognizing Delirium Stems from DEP

Four of the six participants verbalized that their confidence in recognizing delirium improved. Examples that illustrate this theme are listed below.

"I improved…or increased (was referring to confidence)… definitely feel more comfortable because" (RN1)

"I had more confidence after rather just ….after watching the delirium education program and case studies with simulation." (RN2)

"It (was referring to DEP) improved my skills and confidence…it did improved my confidence in recognizing delirium." (RN5)

"I felt pretty confident even assessing it but I felt very confident in observing it and treatment and things like that" (RN6)

Theme Number Five: Delirium: Frequent or Not?

Across participants, an emergent consideration was the frequency of delirium cases in their clinical practice. Participants expressed that delirium cases were not as frequent, although many admitted that they may have initially miscategorized delirium as substance abuse such as alcohol withdrawal. Here is what participants had to say on this theme.

"Actually we see a lot, after a procedure or when they wake up and they don't have sedation." (RN5)

"I wouldn't say that is really that often …" (RN1)

"… so I see a lot of that …" (RN2)

"Maybe frequency, I get that once a month … But I still would have one patient that manifests some sort of unusual behavior." (RN3)

Evidently there was a great deal of variability in the frequency of delirium cases in the various units of the participants, indicating they all experienced delirium occurrence individually. In analyzing the frequency of delirium case experiences, two subthemes were developed: role of experience as a clinician and challenging cases associated with delirium identification.

Subtheme: Experience as a clinician is a key. This subtheme emerged as the researcher and the participants discussed their experiences with caring for patients with delirium. Participants felt that their experiences as a clinician played a key role in their ability to adequately diagnose and treat delirium.

"I have …ah ..multiple situations or experiences with…you know taking care of patients with delirium. I have been a nurse for xx years and xx years of that is in ICU …" (RN2)

"I am a part-time employee so I do patient care maybe once or twice a week depending if I am not in charge or a rapid response nurse or sepsis." (RN3)

"… I feel that more of my experience is more related to alcohol withdrawal and not delirium." (RN1)

"Oh, I still feel I need to practice more on real patients.... It's just that I need to practice it at the bedside." (RN4)

Whereas RN2 is experienced with treating patients with delirium, RN 1, RN 3, and RN4 are not so secure in their experience, indicating that more experienced nurses who work in

certain contexts, such as the ICU, may have more experience working with patients who suffer from delirium. RN 4 expressed that she needs to practice more at the bedside.

Subtheme: Challenges in clinical practice related to identification of delirium. The subtheme, challenges in clinical practice, emerged when the participants discussed their experiences in the clinical setting. Participant RN4 highlights the challenge associated with delirium identification and accurately reporting the frequency of delirium because it is sometimes confused with other conditions such as dementia, anxiety, alcohol withdrawal, or just unusual behavior. The following examples demonstrate the challenges in the recognition of delirium, dementia, and anxiety:

"I have a lot of patients but our confusion was, were they demented or they delirious. That is unclear to us. There are so many patients coming in and they have already dementia going on and now going through surgery, go to ICU, then develop psychosis." (RN4)

"But I still have would have one patient that manifests some sort of unusual behavior." (RN3)

Participants RN3 and RN4 as well stated the challenge with recognizing delirium versus dementia.

"Three days ago I just had a patient who was extubated, rather than labeling her crazy. Does she have dementia? Is it anxiety? Is it delirium?" (RN3)

"I have a lot of patients but our confusion was, were they demented or they delirious? That is unclear to us. There are so many patients coming in and they have already dementia going on and now going through surgery, go to ICU, then develop psychosis. For me it is really difficult to figure out whether they are delirious or demented because that is two different treatments." (RN4)

More so, two participants RN 1 and RN3 also talked about challenges with alcohol withdrawal and delirium. Some of the comments that illustrate this are as follows:

"I would like to say I also see delirium patients but I also see alcohol withdrawal patients which might not be delirium but alcohol withdrawal."(RN1)

"We get too many patients now with alcohol withdrawal but the question is when they become agitated, do they really have delirium or is it just part of alcohol withdrawal?" (RN3)

Section Summary

The qualitative data analysis identified two main findings. First, all six participants expressed a positive outlook toward the educational intervention. Second, the following five themes permeate the lived experiences of these nurses of the delirium education program: Theme One: participants' outlook about the delirium education program; Theme Two: DEP is high quality with 4 subthemes: 1) DEP is concise, relevant, and effective; 2) DEP helps with busy schedule; 3) NuDESC is a user-friendly tool; 4) mandating DEP for all nurses; Theme Three: awareness or knowledge of delirium comes with DEP; Theme Four: confidence in recognizing delirium stems from DEP; and Theme Five: delirium: frequent or not? with 2 subthemes: 1) experience as a clinician is a key and 2) challenges in clinical practice related to identification of delirium.

Integration of the Quantitative and Qualitative Data Results

As the final phase of this explanatory sequential mixed method design, it is essential to integrate the quantitative and qualitative results using the embedded technique. Embedding the dataset of the qualitative strand following the quantitative strand helped explain the results of the impact of the results of the study. Results of both strands show both convergence and divergence. The results converge with respect to self-confidence post-educational intervention. Quantitative results showed that participants' self-confidence increased from pretest to posttest but that this change was notable only for those in the educational intervention and not those in the control group. Four of the six participants from the intervention group who completed the semi-structured interviews verbalized that their confidence in recognizing delirium improved. Examples that illustrate this construct, increased in confidence are below.

"I improved…or increased (was referring to confidence)… definitely feel more comfortable

because" (RN1)

"I had more confidence after rather just ….after watching the delirium education program and case studies with simulation." (RN2)

"It (was referring to DEP) improved my skills and confidence…it did improved my confidence in recognizing delirium." (RN5)

"I felt pretty confident even assessing it but I felt very confident in observing it and treatment and things like that" (RN6)

These qualitative findings support this conclusion insofar as participants expressed an increase in self-confidence, primarily because the educational intervention reduced confusion and clarified how better to diagnose and treat patients with delirium.

This notwithstanding, there was also divergence among the two strands. Whereas the quantitative results reveal no statistically significant differences on knowledge of delirium between the intervention and control group, the qualitative findings portray a different story. Participants strongly felt that they not only liked the educational intervention but that it also helped to increase their understanding of delirium, how to identify or recognize delirium, its associated risk factors, and how to better treat patients with delirium. Excerpts that show these are below.

"...it was interesting that I took the pretest that I did not know like the urinary catheter, also the hip replacement question, why would that be and these are the things that didn't know. I feel that the PowerPoint that you put together and then the case studies, that was great." (RN1)

"Oh…I actually think a patient with diabetes is at higher risk for delirium because they end up with electrolyte imbalances. What do you think?" (RN2)

"I think they do because their blood sugars are up and down, very labile and if they don't have a very good control of diabetes definitely their blood sugars fluctuations definitely affecting their mental status at that time and I think that will put them at higher risk for delirium. You know they have neuropathy and that will decrease their sensation as well that will … I think… it will add on to the risk for delirium." (RN4)

The narratives above suggested that participants felt that their knowledge of delirium increased as a result of the intervention. However, the quantitative results do not support this claim. Plausibly, the knowledge measure may have been flawed in capturing a wider breadth of dimensionality of delirium. Participant RN6 felt that the items in the knowledge measure were confusing. It may be that other participants did not express this either out of courtesy or professional respect. Examples of these questions from the measure are: "Delirium is generally caused by alcohol withdrawal?" and "A family history of dementia predisposes a patient to delirium?" The narrative from RN6 is below.

"The questions in the pre and posttest, the wording, was a little bit confusing, it took me a little bit of time. Other than that there is nothing I would like to change to the delirium education program. It was concise and relevant and very applicable." (RN6)

If this was the case, the knowledge measure may have occluded real differences in knowledge between the participants in the intervention and control group at posttest that the qualitative interviews nevertheless captured. Therefore, this is an important finding that needs to be looked at in future research. Although only one participant took note of this, it captured an important point in relation to the research questions. Furthermore, it is also important to mention that the knowledge measure could have measured the basic knowledge of the participants whereas the intervention was geared towards the application of the concepts of delirium which was not captured by the questionnaire.

Chapter 5

Conclusions and Recommendations

Study Purpose

The purpose of this explanatory sequential mixed methods study was to develop and evaluate the effect of a delirium education program on improving critical care nurses' knowledge and self-confidence in identifying delirium and the associated risk factors. Furthermore, it was aimed to explore the nurses' perceptions and account of their experiences of the delirium educational program. A sample of 32 critical care nurses from a large community hospital in Southern California participated in the quantitative phase (Phase 1) of the study over about a month period. The participants were randomly assigned to the intervention (n=16) and control (n=16) groups. Six nurses from intervention group participated in the qualitative phase (Phase II) of the study.

Delirium Education in the Acute Care Setting

There is scarcity of information regarding effective educational programs, strategies or interventions, and its usefulness in the acute care settings (Akechi et al., 2010). Staff education is also a crucial aspect of delirium prevention. Nurses spend more time with patients and play an essential role in the prevention of delirium. They help improve detection rates, advocate for early prevention and management interventions, and provide necessary care to patients with delirium (Akechi et al., 2010; Baker, Taggart, Nivens, & Tillman, 2015; Baron, & Holmes, 2013; Cerejeira & Mukaetova-Ladinska, 2011; Faught 2014; Kalish, Gillham, & Unwin, 2014; Kostas, Zimmermann, & Ryder, 2012; McCrow, Sullivan, & Beattie,2014; Reynish, Milisen, 2012; Yanamadala, Wieland, & Heflin, 2013).

Effects of the Educational Intervention on Knowledge and Self-Confidence

Effective strategies or type of educational interventions for healthcare staff in improving both knowledge, skills, and confidence in recognizing delirium are: interactive sessions, didactic lectures, web-based nurse training, case scenarios, scripted unfolding case studies, team objective structured clinical encounter (TOSCE), in-service education and use of resource nurses for training.

Self-Confidence in Delirium Recognition

Educational interventions that were found to be effective improving self-confidence of healthcare professionals in recognizing delirium:

a) A month-training for delirium-link nurses (Akechi et al., 2010).
b) Two or more lectures of a comprehensive and sequential intervention (CSI) (a progressive four-part didactic series, interactive small group sessions and case conferences) (Ramaswamy et al., 2011)

Findings in this study were similar to these educational intervention studies. This study utilized an online educational intervention with simulation one-on-one case studies with role playing. The results of this research study showed an increase in the self-confidence of the nurses who receive the intervention focused on identifying delirium and its associated risk factors.

Knowledge of Delirium

Educational interventions that proved to be effective in increasing knowledge are:

a) Use of Intensive Care Delirium Screening Checklist (ICDSC) and multifaceted education consisted of a pharmacist-led didactic lecture, web-based module, and nurse-led bedside training (Gesin et al., 2015).
b) Clinically-based scenarios (Devlin et al, 2008).

c) In-service type of educational intervention (Hare et al., 2008).

d) Two or more lectures of a comprehensive and sequential intervention (CSI) (a progressive four-part didactic series, interactive small group sessions and case conferences) (Ramaswamy et al., 2011)

e) The interprofessional educational intervention with SLM and TOSCE of life delirium patients (EOLD) (Brajtman, et al., 2012).

f) Web-based educational intervention (McCrow et al., 2014)

Recognition of Delirium

Educational interventions that proved to be effective improving the skills of recognizing delirium are:

a) Use of Intensive Care Delirium Screening Checklist (ICDSC) and multifaceted education consisted of a pharmacist-led didactic lecture, web-based module, and nurse-led bedside training (Gesin et al., 2015).

b) Interactive teaching modules with real life case scenarios (Featherstone et al., 2010).

c) Teaching sessions and posters (Vidan et al. ,2009)

d) Combined didactic and two scenario-based (case studies) educational intervention (Devlin et al, 2008)

e) Case vignettes (Fick et al., 2007)

f) A scripted unfolding case study with debriefing session (Page et al., 2010).

g) A multifactorial intervention program consisted of a 2-day course (Lundstrom et al., 2005).

h) Studies that employ resource nurses, feedback on performance, and protocols (Yanamadala et al., 2013).

i) Web-based educational (McCrow et al., 2014)

This research study's quantitative results revealed no significant differences on the knowledge scores between the intervention and the control groups. Three extreme outliers in the data utilizing box plots by group were detected. Data excluding the outliers were again analyzed utilizing SPSS and showed the same results. The educational intervention consisted of an online education followed by one-on-one case studies with role playing. High fidelity simulation (HFS) which may be an effective educational strategy than role playing was the initial plan however, due to time constraints and participants' preference, role playing ruled over HFS. At this point, it is important to note that the results indicated that the educational intervention is not effective after all in terms of increasing the knowledge of the participants. Suggestions how to better improve the educational intervention is further discussed in the recommendation sections. However, on the other hand, qualitative results did not support this finding because participants strongly felt that the educational intervention helped increase their understanding of delirium (i.e. recognizing or identifying delirium, its associated risk factors). The qualitative analysis of the individual participant case studies actually showed that the participants not only showed knowledge acquisition from the online education (concrete experience and reflective observation) but also indicated they reflected on things that they have learned from the DEP (abstract conceptualization) and applied the knowledge learned in actual cases (active experimentation).

Type of Educational Intervention

The qualitative strand of this mixed methods study revealed the preferences of the nurses with regards to the type of education intervention. Results showed that majority of the participants appreciated the ease and convenience of having an online educational intervention,

expressing that unlike traditional modes of delivery; it fit their busy schedules far better. Furthermore, they also have positive comments about adding case studies with role playing to the PowerPoint or didactic portion of the education program.

Similarly, studies that were reviewed showed that multi-faceted type of educational interventions such as combination of interactive case-based scenarios and web-based modules were effective in increasing knowledge and self-confidence in recognizing delirium (Gesin et al., 2015).

Utilizing NuDESC Tool in Clinical Practice

According to Lutz et al. (2008), the NuDESC scoring system is a quick and easy observational screening scale to recognize delirium and does not require patient participation unlike other delirium screening scales. The ease of use of this delirium scoring system is reflected on this research study's qualitative results when all the participants expressed their thoughts about tool as very useful, effective and very easy to use. The participants articulated their wish to be able to use this tool to assess patients in their current clinical setting. A couple of participants even stated their frustration with the tool that they currently use and commented that it was hard to use compared to NuDESC.

Mandating the DEP for all Nurses

The need for mandating the delirium education program for all nurses stems from the fact that approximately 10-30% of general hospital admissions develop delirium and non-detection rates by healthcare workers in the acute care setting were reported at 72-75%. Nurses who spend more time with patients play a crucial role in the early recognition of delirium to improve patient outcomes. The results of this study showed that the participants agreed that the delirium education program should be offered not only to critical care nurses but to all nurses in the acute

care setting. This is a recommendation that will be discussed further in the section, recommendations for nursing and nursing education.

Challenges in Clinical Practice Related to Delirium Identification

It is important to note that the results of this study related to a learning needs assessment by the nurses. The learning need highly suggested including concepts of differentiating substance abuse (e.g. alcohol withdrawal syndrome) and other conditions (dementia, anxiety).

Bias of the Study

The most important bias of this researcher was related to being a nurse educator and having done a lot of literature search on delirium which could have fostered the development of competence on the phenomenon of interest in the researcher. Having the ability to identify biases, assumptions, and preconceptions to the phenomenon by this researcher enabled bracketing thus it was a means of reducing the chance of imposing pre-existing assumptions, biases, or preconceptions on the study which may influence the outcomes. Bracketing and transparency are critical to the success of the data analysis (Streubert and Carpenter, 2011). Participants' perspectives were obtained not that of the researcher's.

Limitations of the Study

Any research study has its own limitations. The primary limitation of this study was the small sample size. In addition, a limitation that was also noted related to the sample is the exclusion of new graduate nurses. In any clinical setting, there will be always be different levels of expertise (novice to expert). New graduate nurses belong to the novice group. The exclusion of the novice nurses could have affected the generalizability of the results of this study. It would have been interesting to take note and compare the knowledge and confidence scores of the new graduate nurses with that of the experienced nurses as well as the accounts of their experiences

related to the intervention if they were included in the study. The rationale for excluding the new graduate nurses was that during the time that the study was conducted, these nurses were pre-occupied with completing their mandatory educational modules, classes, and bedside orientation.

Other study limitations were technological access and computer skills which may have an effect on the generalizability of results. Follow-up with participants revealed some issues related to this. The quantitative component of the study was conducted in an online environment, the survey questionnaires and educational module. A couple of the participants had difficulty in accessing the survey and a few nurses closed their internet browsers too early even before they even accessed the educational module. The researcher assisted the participants in accessing the survey. For those who have already completed the survey and was not able to access the online module, the researcher provided them with second copy of the online module via email.

Another limitation of the study was related to maintaining a controlled environment or condition. Some of the participants completed the survey at the workplace where the workload, environment, and other factors such as interruptions could have affected the results of their survey scores and ability to learn from the online module. Furthermore, accessibility to online content related to phenomenon of interest during the pretests and the posttests survey was not within the control of the researcher.

The participants work in the same work environment. Interaction between the intervention and control group cannot be prevented by the researcher to happen. Discussion and comparing notes between nurses from both groups can happen and this can affect the generalizability of the results.

The presence of confounding variables such as years of nursing experience or critical care experience could also affect the scores of the participants. If a participant had experience

with caring for delirium patients then this can affect how the nurses' knowledge and confidence in identifying delirium. These variables were not controlled in this study. Another factor that can affect the knowledge and confidence scores of the participants is receiving any other type of education related to delirium during the research. There could have been an instance during their shift interdisciplinary rounds where the physician and the nurse discussed his/her patient diagnosed with delirium. Concepts related to the prevention and caring for patients with delirium may have been presented during the rounds and can affect the knowledge and confidence scores of the nurse.

In the qualitative component of the study, a limitation of the study was related to the working relationship of the researcher to the participants. Although member check was done, participants may not have answered the interview questions honesty out of courtesy or professional respect for the researcher. In addition to this, another factor which cannot be controlled was the participants' fear of social acceptance in honestly describing their experiences during the interview portion of the study.

External validity could be an issue in this study because the sample was obtained from a single geographic location or facility. Therefore, the sample could not have been a representative of the critical care nurses population. This research study was done in a CCU and CVICU where the focus of expertise is cardiac. There was no representation from neurological ICU.

Last but not the least, due to the time constraints and resources, this research study has not been conducted in a longer period of time and more number of participants.

The aforementioned limitations could potentially affect the representativeness of the sample, therefore limiting the ability to generalize study findings to all acute care nurses.

Recommendations for Nursing Education

This research study was conducted from the perspective of a clinical nurse educator in the acute care setting administering the intervention with the results that will help support hospital administration, nursing education, and future educators who not only would like to administer this intervention but also with an aim to help nursing staff recognize delirium early and improve patient outcomes. The results of this study have led to several recommendations.

Since the quantitative results did not show any statistical difference in knowledge scores between the intervention and control groups, there is a need to look at improving the educational intervention. Suggestions to improve the educational intervention can be geared towards incorporating HFS in groups of 4-5 to allow for in-depth and rich discussion of cases as well as time for debriefing. If role playing is used over HFS, utilizing a standardized patient (SP) may provide improved results. The SP is a trained person who is able to portray a case scenario consistently over time that allows the learner the same learning opportunity. This form of standardization permits both educators and learners to the uniqueness of each performance. Another type of educational intervention that can help improve the knowledge of the participants may start with a case study followed by the online educational module then again followed by a case study.

Results on the self-confidence scores showed a statistical difference between the two groups. The narrative comments also reveal that the participants considered the DEP of high quality and clarified some of their confusion on some concepts about delirium. Thus, the created multifaceted delirium education program, a combination of web-based module and one-on-one case study/vignette with role playing, proved to be a very effective mode of education delivery to increase confidence. The content of the program was sufficient enough to clarify certain

ambiguities that the nurses have. Although there was a mention of a learning need to clarify the differences between substance abuse and anxiety, these concepts can easily be added to the learning module and case studies.

Hospital administration and nursing education need to realize that it is crucial for hospitals to develop education programs geared towards improving detection, early recognition, and prevention of delirium to improve patient outcomes and decrease healthcare costs. Nurses who spend more time with patients play a critical role in the prevention of delirium, improving detection rates, advocating for early prevention and management interventions, and providing necessary care to patients with delirium. In order to address this concerning issue, a multifaceted delirium educational intervention should be mandated to all nurses working in the acute care setting. Several of the participants expressed this sentiment that all nurses in their unit should be required to undergo the training or even from the whole hospital.

Another recommendation which was also deemed to be significant is to use an easy tool or scale to assess delirium at the clinical setting. The narrative comments of the nurses in this study highly recommended the use of the NuDESC tool. For the nursing administration and nursing education, it is vital to note that early detection of delirium can be related to compliance of assessment of delirium in patients. If the nurses are challenged or frustrated in using a complex scale to assess delirium, chances are they will not use the tool or maybe use it incorrectly. This frustration may add to the other nursing workload such as complexities and high patient acuities. Providing nurses an easy scale or tool to use will be decrease the hesitancy to use the tool, maybe increase nursing satisfaction, and maybe increase the detection rates of delirium at the bedside which eventually will improve patient outcomes through early prevention and treatment.

Recommendations for Future Research

After data analysis has been completed, several recommendations related to future studies can be made.

1. Replicate the study using a larger sampler size of acute care nurses in multiple locations (different facilities) to come up with more generalizable findings.
2. Replicate the study in different units to explore nursing learning needs caring for different type of patient population (e.g. medical-surgical units) since this study was done in the critical care setting.
3. Conduct a multi-faceted educational intervention to include high fidelity simulation. High fidelity simulation has shown to improve nursing students' knowledge and self-confidence.
4. Consider to add a didactic lecture in the classroom setting to address other learning styles. Some people learn more in the classroom setting than on online learning modules.
5. Conduct the educational intervention in a longer period of time instead of a four-week long intervention to achieve more conclusive results.
6. Address some confounding variables such as years of nursing experience to obtain generalizability of the findings.
7. If using a web-based survey or module, make sure to address how technological issues will be addressed.
8. It might be interesting to focus an educational intervention to address specific patient population such as delirium in patients with substance abuse due to the increasing trend of admission of these types of patients.

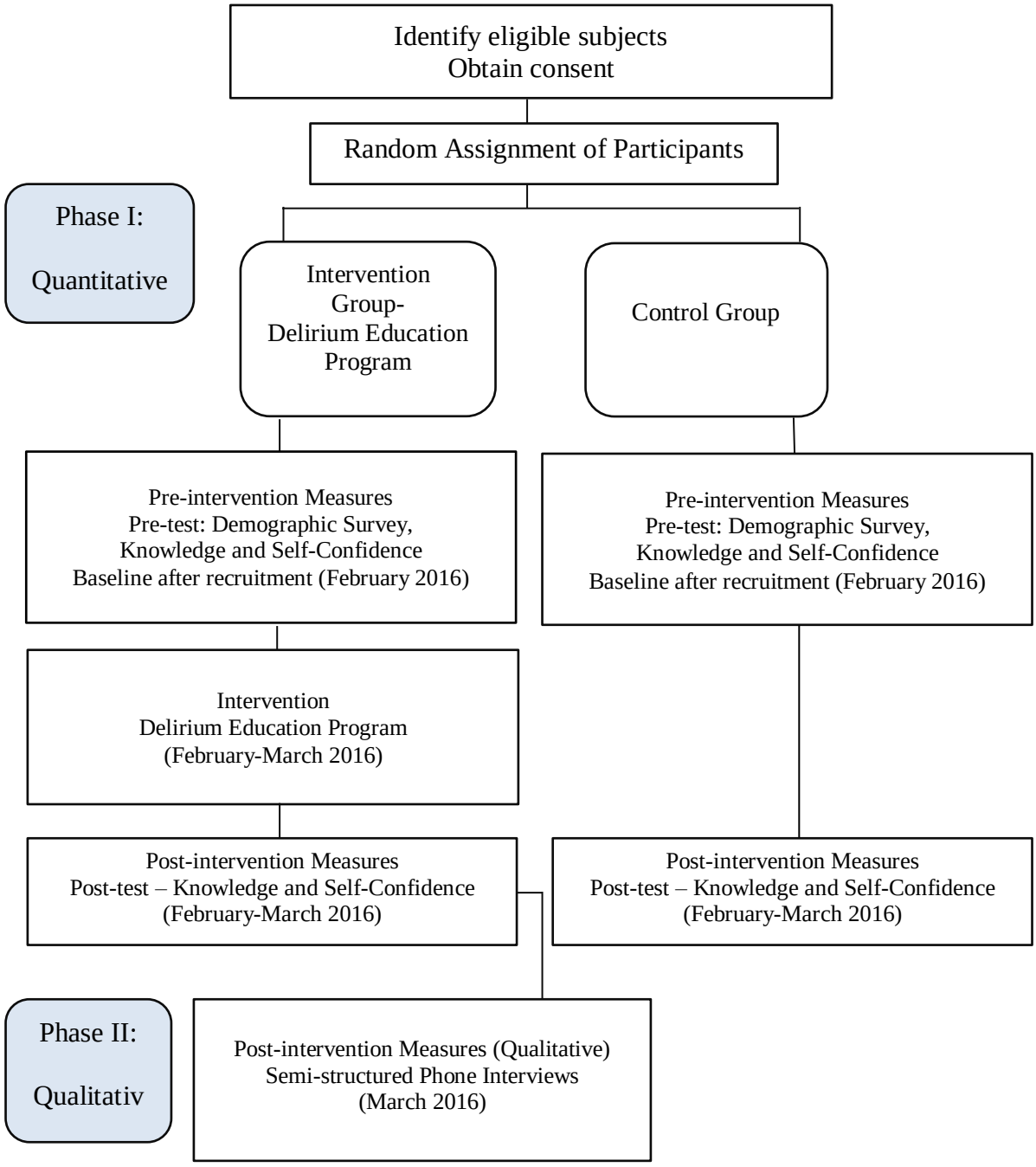
Summary

This chapter presented a summary of the results and conclusions of the study related to the effect of the DEP on critical care nurses' knowledge and self-confidence. Conclusions were made after data integration was done. Researcher bias and study limitations were explored. Recommendations for future research and nursing education were included. Implications of findings for nursing education and future research were provided.

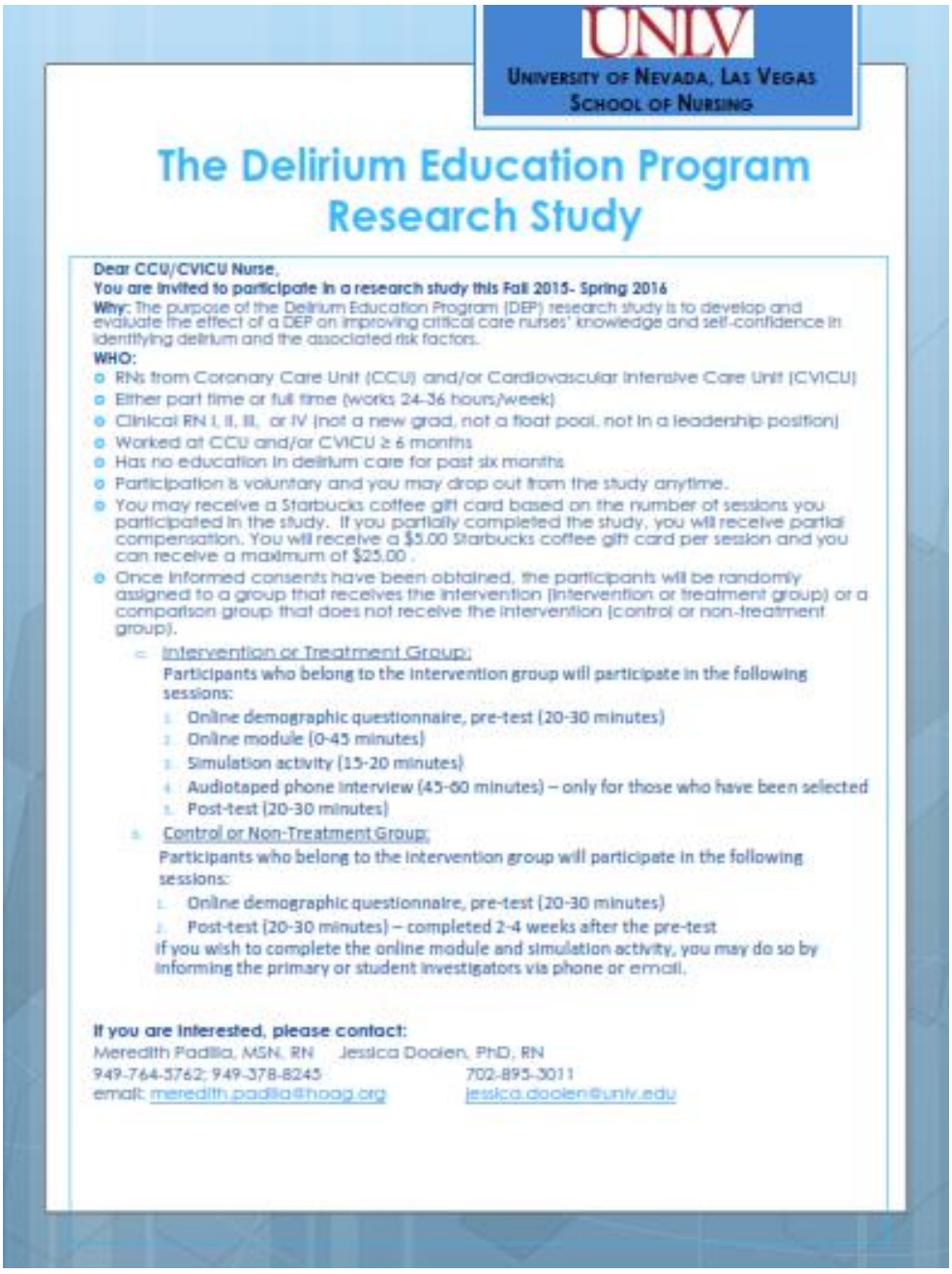
Conclusion

The findings of this mixed methods study indicate that the DEP developed by the researcher increased the self-confidence of nurses. Although the DEP has room for improvements such as changing the mode of educational delivery as well as adding more information to the content such as alcohol withdrawal, it has its important potential uses in nursing education and clinical nursing practice. To improve the knowledge and self-confidence of nurses in identifying delirium at the clinical setting, nursing education needs an effective and concise DEP. Furthermore, availability of a user-friendly assessment tool to assess delirium such as NuDESC that can be used by nurses is also vital in the clinical setting. Results of this dissertation research study have indicated that the DEP developed by the researcher, an online module followed by one-on-one case study/vignette with role playing can be improved to provide an effective educational program for critical care nurses in increasing their knowledge and self-confidence in identifying delirium and the associated risk factors.

Appendix A Diagram of Data Collection Process



Appendix B Participant Nurse Recruitment Email (Approved by UNLV IRB)



UNLV
University of Nevada, Las Vegas
School of Nursing

The Delirium Education Program Research Study

Dear CCU/CVICU Nurse,

You are invited to participate in a research study this Fall 2015- Spring 2016

Why: The purpose of the Delirium Education Program (DEP) research study is to develop and evaluate the effect of a DEP on improving critical care nurses' knowledge and self-confidence in identifying delirium and the associated risk factors.

WHO:

- RNs from Coronary Care Unit (CCU) and/or Cardiovascular Intensive Care Unit (CVICU)
- Either part time or full time (works 24-36 hours/week)
- Clinical RN I, II, III, or IV (not a new grad, not a float pool, not in a leadership position)
- Worked at CCU and/or CVICU ≥ 6 months
- Has no education in delirium care for past six months
- Participation is voluntary and you may drop out from the study anytime.
- You may receive a Starbucks coffee gift card based on the number of sessions you participated in the study. If you partially completed the study, you will receive partial compensation. You will receive a $5.00 Starbucks coffee gift card per session and you can receive a maximum of $25.00 .
- Once informed consents have been obtained, the participants will be randomly assigned to a group that receives the intervention (intervention or treatment group) or a comparison group that does not receive the intervention (control or non-treatment group).
  - Intervention or Treatment Group:

    Participants who belong to the intervention group will participate in the following sessions:
    1. Online demographic questionnaire, pre-test (20-30 minutes)
    2. Online module (0-45 minutes)
    3. Simulation activity (15-20 minutes)
    4. Audiotaped phone interview (45-60 minutes) – only for those who have been selected
    5. Post-test (20-30 minutes)
  - Control or Non-Treatment Group:

    Participants who belong to the intervention group will participate in the following sessions:
    1. Online demographic questionnaire, pre-test (20-30 minutes)
    2. Post-test (20-30 minutes) – completed 2-4 weeks after the pre-test

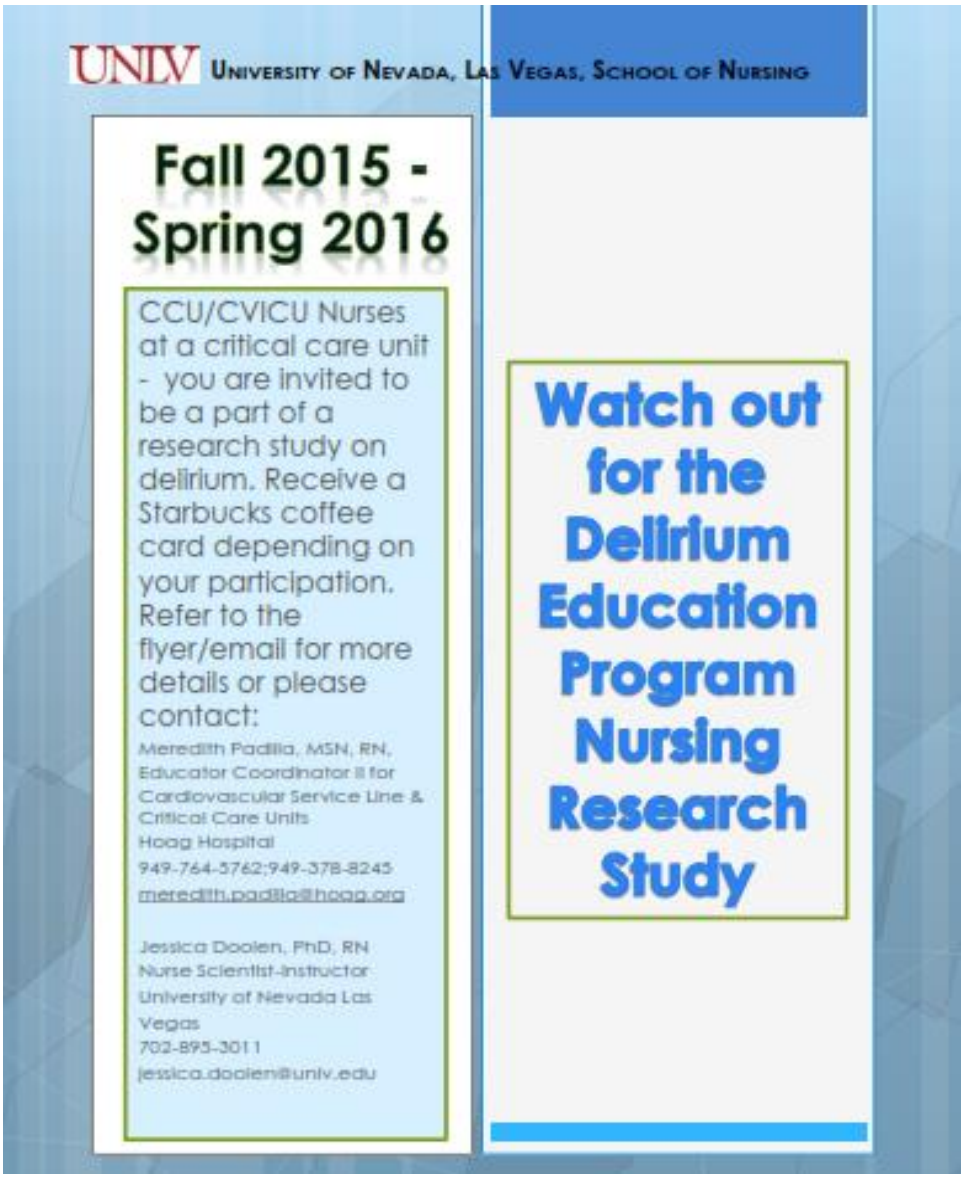
    If you wish to complete the online module and simulation activity, you may do so by informing the primary or student investigators via phone or email.

If you are interested, please contact:

Meredith Padilla, MSN, RN — 949-764-5762; 949-378-8245 — email: meredith.padilla@hoag.org

Jessica Doolen, PhD, RN — 702-895-3011 — jessica.doolen@univ.edu

Appendix C Participant Nurse Recruitment Flyer (Approved by UNLV IRB)



Appendix D UNLV IRB Approval

UNLV

UNLV Biomedical IRB - Expedited Review
Approval Notice

DATE:	December 23, 2015
TO:	Jessica Doolen
FROM:	UNLV Biomedical IRB
PROTOCOL TITLE:	[797871-2] Delirium Education Program for Critical Care Nurses: A Mixed Methods
SUBMISSION TYPE:	Revision
ACTION:	APPROVED
APPROVAL DATE:	December 23, 2015
EXPIRATION DATE:	December 22, 2016
REVIEW TYPE:	Expedited Review

Thank you for submission of Revision materials for this protocol. The UNLV Biomedical IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a protocol design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

PLEASE NOTE:
Upon approval, the research team is responsible for conducting the research as stated in the protocol most recently reviewed and approved by the IRB, which shall include using the most recently submitted Informed Consent/Assent forms and recruitment materials. The official versions of these forms are indicated by footer which contains approval and expiration dates.

Should there be any change to the protocol, it will be necessary to submit a **Modification Form** through ORI - Human Subjects. No changes may be made to the existing protocol until modifications have been approved.

ALL UNANTICIPATED PROBLEMS involving risk to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NONCOMPLIANCE issues or COMPLAINTS regarding this protocol must be reported promptly to this office.

This protocol has been determined to be a Minimal Risk protocol. Based on the risks, this protocol requires continuing review by this committee on an annual basis. Submission of the **Continuing Review Request Form** must be received with sufficient time for review and continued approval before the expiration date of December 22, 2016.

- 1 -

If you have questions, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 702-895-2794. Please include your protocol title and IRBNet ID in all correspondance.

Office of Research Integrity - Human Subjects
4505 Maryland Parkway . Box 451047 . Las Vegas, Nevada 89154-1047
(702) 895-2794 . FAX: (702) 895-0805 . IRB@unlv.edu

UNLV

UNLV Biomedical IRB - Expedited Review
Modification Approved

DATE:	March 31, 2016
TO:	Jessica Dooley
FROM:	UNLV Biomedical IRB
PROTOCOL TITLE:	[797871-3] Delirium Education Program for Critical Care Nurses: A Mixed Methods
SUBMISSION TYPE:	Amendment/Modification
ACTION:	APPROVED
APPROVAL DATE:	March 31, 2016
EXPIRATION DATE:	December 22, 2016
REVIEW TYPE:	Expedited Review

Thank you for submission of Amendment/Modification materials for this protocol. The UNLV Biomedical IRB has APPROVED your submission. This approval is based on an appropriate risk/benefit ratio and a protocol design wherein the risks have been minimized. All research must be conducted in accordance with this approved submission.

Modifications reviewed for this action include:

1. The simulation activity will be changed to a one-on-one case study with role playing.

This IRB action will not reset your expiration date for this protocol. The current expiration date for this protocol is December 22, 2016.

Should there be any change to the protocol, it will be necessary to submit a **Modification Form** through ORI - Human Subjects. No changes may be made to the existing protocol until modifications have been approved.

ALL UNANTICIPATED PROBLEMS involving risk to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed.

All NONCOMPLIANCE issues or COMPLAINTS regarding this protocol must be reported promptly to this office.

This protocol has been determined to be a Minimal Risk protocol. Based on the risks, this protocol requires continuing review by this committee on an annual basis. Submission of the Continuing Review Request Form must be received with sufficient time for review and continued approval before the expiration date of December 22, 2016.

If you have questions, please contact the Office of Research Integrity - Human Subjects at IRB@unlv.edu or call 702-895-2794. Please include your protocol title and IRBNet ID in all correspondence.

Office of Research Integrity - Human Subjects
4505 Maryland Parkway . Box 451047 . Las Vegas, Nevada 89154-1047
(702) 895-2794 . FAX: (702) 895-0805 . IRB@unlv.edu

Appendix E Consent Form: Quantitative Study (Approved by UNLV IRB)

UNLV

INFORMED CONSENT FOR SURVEY PARTICIPANTS

Department of Nursing

Consent Form: Quantitative Study

TITLE OF STUDY: Delirium Education Program for Critical Care Nurses: A Mixed Methods Study

INVESTIGATOR(S): Jessica Doolen, PhD, APRN, CNE; Meredith Padilla, MSN, RN

For questions or concerns about the study, you may contact Meredith Padilla at 949-378-8245.

For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted, contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 877-895-2794 or via email at IRB@unlv.edu.**

Purpose of the Study

You are invited to participate in a research study. The purpose of this study is to develop and evaluate the effect of a delirium education program on improving the critical care nurses' knowledge and self-confidence in identifying delirium and the associated risk factors.

Participants

You are being asked to participate in the study because you work at the Coronary Care Unit (CCU) and/or Cardiovascular Intensive Care Unit (CVICU) at large hospital in Southern California and that you have attended the Delirium Education Program.

Procedures

If you volunteer to participate in this study, you will be asked to do the following:

You will be randomly assigned to a group that receives the intervention (intervention or treatment group) or a comparison group that does not receive the intervention (control or non-treatment group).

Intervention or Treatment Group:

Participants who belong to the intervention group will participate in the following sessions:

1. Online demographic questionnaire, pre-test (20-30 minutes)
2. Online module (0-45 minutes)
3. Simulation activity (15-20 minutes)
4. Audiotaped phone interview (45-60 minutes) – only for those who have been selected
5. Post-test (20-30 minutes)

Control or Non-Treatment Group:

Participants who belong to the intervention group will participate in the following sessions:

1. Online demographic questionnaire, pre-test (20-30 minutes)
2. Post-test (20-30 minutes) – completed 2-4 weeks after the pre-test

If you wish to complete the online module and simulation activity, you may do so by informing the primary or student investigators via phone or email.

Protocol #797871-2, Expiration: 12-22-16

Risks and Benefits of Participation

There are very minimal expected risks to you as a participant such as such as loss of time and you may become uncomfortable when answering some questions to you if you decide to participate in this study. The benefit for participation is you may obtain knowledge which may be beneficial to your clinical practice as a nurse after you complete the educational intervention.

Cost /Compensation

You will receive a Starbucks coffee gift card for your participation in the study. You will be compensated $5.00 per session. If you partially complete the study, you will receive partial compensation. The sessions are defined as follows: completion of the demographic survey and pre-test, online module, simulation activity, post-test and phone interview. For example, if you completed only 3 sessions, you only get $15.00 however, if you completed all the sessions, then you will receive $25.00.There is no compensation from the Hospital for participation in the study. If you are in the non-treatment or control group or non-treatment group and you wish to complete the online module, you may do so by informing the primary or student investigators via phone or email.

Confidentiality

All information gathered in this study will be kept as confidential as possible. No reference will be made in written or oral materials that could link you to this study. All records will be stored in a locked facility at UNLV for 5 years after completion of the study and only the primary and student investigators will have access to them. After the storage time the information gathered will be destroyed.

Voluntary Participation

Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with UNLV and the hospital. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Participant Consent:

I have read the above information and agree to participate in this study. I have been able to ask questions about the research study. I am at least 18 years of age. A copy of this form has been given to me.

Signature of Participant _____ Date _____

Participant Name (Please Print) _____

Appendix F Consent Form: Qualitative Study (Approved by UNLV IRB)

UNLV

INFORMED CONSENT FOR INTERVIEW PARTICIPANTS

Department of Nursing

Consent Form: Qualitative Study

TITLE OF STUDY: Delirium Education Program for Critical Care Nurses: A Mixed Methods Study

INVESTIGATOR(S): Jessica Doolen, PhD, APRN, CNE; Meredith Padilla, MSN, RN

For questions or concerns about the study, you may contact Meredith Padilla at 949-378-8245.

For questions regarding the rights of research subjects, any complaints or comments regarding the manner in which the study is being conducted, contact **the UNLV Office of Research Integrity – Human Subjects at 702-895-2794, toll free at 877-895-2794 or via email at IRB@unlv.edu.**

Purpose of the Study

You are invited to participate in a research study. The purpose of this study is to develop and evaluate the effect of a delirium education program on improving the critical care nurses' knowledge and self-confidence in identifying delirium and the associated risk factors.

Participants

You are being asked to participate in the study because you fit this criteria: 1) you work at the Coronary Care Unit (CCU) and/or Cardiovascular Intensive Care Unit (CVICU) at large hospital in Southern California as a full-time or part-time (24-36 hours per week) staff nurse for at least six months, 2) you did not receive any education on delirium care for six months, and 3) you are not a new graduate nurse, a float pool nurse, or in a nursing leader (e.g. charge nurse).

Procedures

If you volunteer to be a participant in this study, you will be asked to participate in an audiotaped phone interview which might take 45-60 minutes and will focus on your experience of Delirium Education Program. The interview will be conducted at a comfortable, quiet undisturbed private location chosen by you, as the participant. Each of the settings (researcher and participant) has a closed door where only the researcher and the participant are present in the room. The room can be a private room at your home or workplace and researcher's workplace or private office. It will be assured that the researcher is alone in the room at the time of interview, the doors are closed and no one can overhear the interview. This will help maintain your right to privacy and confidentiality as a participant. The researcher prior to the start of the interview will notify you when the digital audio tape is activated and when they are turned off during the interview.

Risks and Benefits of Participation

There are very minimal expected risks to you as a participant such as such as loss of time and you may become uncomfortable when answering some questions to you if you decide to participate in this

Protocol #797871-2, Expiration: 12-22-16

study. The benefit for participation is you may obtain knowledge which may be beneficial to your clinical practice as a nurse after you complete the educational intervention.

Cost /Compensation
You will receive a Starbucks coffee gift card for your participation in the study. You will be compensated $5.00 for this session. If you partially complete the study, you will receive partial compensation.

Confidentiality
All information gathered in this study will be kept as confidential as possible. No reference will be made in written or oral materials that could link you to this study. All records will be stored in a locked facility at UNLV for 5 years after completion of the study and only the primary and student investigators will have access to them. After the storage time the information gathered will be destroyed.

Voluntary Participation
Your participation in this study is voluntary. You may refuse to participate in this study or in any part of this study. You may withdraw at any time without prejudice to your relations with UNLV and the hospital. You are encouraged to ask questions about this study at the beginning or any time during the research study.

Participant Consent:
I have read the above information and agree to participate in this study. I have been able to ask questions about the research study. I am at least 18 years of age. A copy of this form has been given to me.

Signature of Participant _____ Date _____

Participant Name (Please Print) _____

Participant Consent for Audio Taping:
I agree to be audiotaped for the purpose of this research study.

Signature of Participant _____ Date _____

Participant Name (Please Print) _____

Appendix G Demographic Survey Questionnaire

*** 1. What is your ID #**
(Enter a value between 101 and 517)

_____

2. What is your age? (Select one option)

- ○ 20 to < 30 years
- ○ 30 to < 40 years
- ○ 40 to < 50 years
- ○ greater than or equal to 50 years old
- ○ Prefer not to answer

3. What is your sex? (Select one option)

○ Male ○ Female ○ Prefer not to answer

4. How do you describe yourself? (Race) (Select one option)

○ White alone	○ Asian alone	○ Two or more races	○ Prefer not to answer
○ Black or African American alone	○ Native Hawaiian and Other Pacific Islander alone	○ Hispanic or Latino	

5. Where do you work? (Select one option)

○ Coronary Care Unit (CCU) only	○ Cardiovascular Intensive Care Unit (CVICU) only	○ Both Coronary Care Unit (CCU) and Cardiovascular Intensive Care Unit (CVICU)	○ Prefer not to answer

6. What shift do you work most of the time? (Select one option)

○ Day Shift ○ Night Shift ○ Prefer not to answer

7. What is your highest educational attainment? (Select one option)

○ Associate Degree in Nursing ○ Master's Degree in Nursing ○ Prefer not to answer

○ Bachelor's Degree in Nursing ○ Doctorate Degree in Nursing

8. What type of employee are you? (full time/part time) (Select one option)

○ Full time (greater than or equal to 36 hours per week) ○ Prefer not to answer

○ Part-Time (greater than or equal to 24 hours per week but less than 36 hours)

9. Total number of years as a nurse? (Select one option)

○ < 2 years ○ 5 to ○ greater than or equal to 15 years

○ 2 to < 5 years ○ 10 to < 15 years ○ Prefer not to answer

10.Number of years in Critical Care? (Select one option)

○ < 2 years ○ 5 to ○ greater than or equal to 15 years

○ 2 to < 5 years ○ 10 to < 15 years ○ Prefer not to answer

11. What best describes you as clinical nurse? (Select one option)

○ Clinical Nurse I ○ Clinical Nurse III ○ Others

○ Clinical Nurse II ○ Clinical Nurse IV ○ Prefer not to answer

12. Do you have any experience in taking care of patients with delirium? (Select one option)

○ Yes ○ No

Appendix H Permission to Use the NKD Questionnaire

Hi Meredith

Acknowledge myself, Fremantle Hospital and Curtin University of Technology. At the end of your study, I would also like to be advised of how you used the questionnaire and your results please.

The questionnaire was set up to be optically scanned using Remark Office™ but you may reformat to whatever suits your needs.

You will need to adjust the demographics page anyway, but I'm happy for you to modify it however you need.

When the completed questionnaires were scanned into Remark Office (and then exported to SPSS), the answers were coded as "correct" or "incorrect" or "unsure" for questions 2.9 on. I didn't use an overall score for the whole questionnaire, but dealt with question 2.1 (definition of delirium), questions 2.2 through 2.8 (tools for identifying delirium) and questions 2.9 on (delirium presentation and risk factors) as separate sections - you may find that another method works better for you.

In that last group of questions (2.9 on) are a mixture of general statements and risk factor statements, and those I added and scored separately.

In the Answers version of the document, the general questions are highlighted in yellow, and the risk factor questions are un-highlighted (there are 14 of each).

Since publication of the article in Contemporary nurse, most of the users of the questionnaire have been postgraduate nursing and medical students. In some cases they have not yet provided results, and in some instances their reporting has been through their academic work and poster presentations at conferences (and hence unpublished).

The questionnaire is in use in various countries around the world (15 at last count including 7 places in the US, and translated into 8 languages other than English) and I have invited some of the users to consider a validation study.

One Western Australian group tells me: "We used the Kuder–Richardson Formula 20 (KR-20) to determine internal consistency reliability co-efficients for the two main sub-sections (3a and 3b) of the knowledge questionnaire at Time 1 (T1). After combining incorrect and unsure responses so that the two options were correct versus incorrect, the Kuder-Richardson internal consistency reliability coefficient for Section 3a of the questionnaire was 0.66 (n=26) and for Section 3b it was 0.80 (n=25)") (Personal communication from A/Prof Chris Toye). These results appear to indicate quite good internal consistency, but I am not aware of any other validation work.

A National Health Service Trust in the United Kingdom received permission a number of years ago to use the questionnaire in a system-wide education program, and had told me that they planned a validation study and have agreed to provide me with the results. Their work was to be part of a 5 year program and I have not yet heard from them.

Malcolm Hare | Clinical Review Audit Analyst | Safety Quality & Risk
South Metropolitan Health Service
Level 1, 16 Ogilvie Road, Mt Pleasant, Locked Bag 8, Canning Bridge WA 6153
T: 08 9318 7547 | **F:** 08 9318 7538
E: Malcolm.Hare@health.wa.gov.au **I** www.health.wa.gov.au

Appendix I Permission to Use the C-Scale

California State University, Sacramento
School of Nursing
6000 J Street• Folsom Hall • Sacramento, CA 95819-6096
T (916) 278-6526 • F (916) 278-6311 • www.csus.edu/Nursing

November 2, 2015

To Whom It May Concern:

I have given permission to Meredith Padilla to use and modify the C-Scale to measure self-confidence in her dissertation research, "Delirium Education Program for Critical Care Nurses: A Mixed Methods Study." The C-Scale was originally published in *Nurse Educator* 1992. It was reprinted in 1993 (Vol. 18, No. 1, pp 6-9) with information that was lacking in the first printing.

Sincerely,

Susan Grundy

Susan Grundy, Ed.D., M.S.N., R.N.

Professor Emeritus

School of Nursing

California State University, Sacramento

Appendix J Delirium Education Program

Description: 1.5 hour workshop (online module) with one-on-one case studies with role playing

Objectives:

Delirium Clinical Pearls

1. Define delirium
2. List the clinical features of delirium
3. Describe the pathophysiology of delirium
4. Compare and contrast delirium and dementia
5. Distinguish the precipitating and predisposing risk factors of delirium
6. Identify the clinical subtypes of delirium
7. Describe the steps in applying the Nursing Delirium Screening Scale (NuDESC) in assessing or recognizing delirium
8. Identify the non-pharmacological and pharmacological interventions to prevent and treat delirium
9. Apply delirium concepts to case studies

Recognition of Risk Factors:

1. To review the key features of Nursing Delirium Screening Scale (NuDESC)
2. To learn how to use the NuDESC

One-on-one Case Studies/Vignettes with role playing

Appendix K Sample of Invitation to Experts

Dear Sir/Maam,

I am writing to you as an expert in the field of neurology, critical care, and delirium. I am a doctoral student in nursing working in the area of adult and geriatric unit where nurses are expected to recognize and assess delirium early to improve patient outcomes. In relation to this, I am developing a Delirium Education Program (DEP) for nurses in the medical-surgical/telemetry units and evaluate its effect on improving the nurses' knowledge and self-confidence in identifying delirium and the associated risk factors. It is also aimed to explore the nurses' perceptions and account of their experiences of the delirium educational program.

You have been selected among the list of experts due to your background in neuroscience, neurology, and critical care especially in delirium due to your vast experience, knowledge and expertise.

The concept of delirium is highly important in the acute care setting. Nearly 30-40% of the delirium cases in the hospital are preventable (Fosnight, S., 2010). Because delirium has significant adverse outcomes, such as increased length of hospital stay, decreased physical and cognitive functions, increased mortality and morbidity, and increased costs to the healthcare settings (Aguirre, 2010; Anderson, Ngo, & Marcantonio, 2012; Andrejaitiene, & Sirvinskas, 2011; Balas et al., 2015; Baron, & Holmes, 2013; Davidson, Winkelman, Gelinas, Dermenchyan, 2015; Fong et al., 2012; Foster et al., 2010; Mangusan, Hooper, Denslow, Travis, 2015; Praditsuwan et al., 2013), early prevention and recognition are vital. Non-detection rates by healthcare workers in the acute care setting were reported at 72-75% (Collins, Blanchard, Tookman & Sampson, 2010; Rice et al., 2011). Hence, it is crucial for hospitals to develop education programs geared towards improving detection, early recognition, and prevention of

delirium to improve patient outcomes and decrease healthcare costs. Health care providers should be educated on preventive measures, risk factors, signs and symptoms of delirium leading towards immediate evaluation (Kalish, Gillham, & Unwin, 2014; Teodorczuk, Reynish, Milisen, 2012). Nurses who spend more time with patients play a crucial role in the prevention of delirium, improving detection rates, advocating for early prevention and management interventions, and providing necessary care to patients with delirium (Baker, Taggard, Nivens, & Tillman, 2015; Cerejeira & Mukaetova-Ladinska, 2011; Faught 2014; McCrow, Sullivan, & Beattie,2014). For these reasons, a DEP has been developed to further educate the nurses and evaluate their knowledge and self-confidence in the identification of delirium and its associated risk factors. There is scarcity of literature on delirium education program for nurses at the acute care setting. Thus, developing this delirium education program is justified.

If you agree, may I ask you to: 1. Complete the expert's rating form. On it you would rate each item on a scale of 1 to 4 (1 as the least relevant and 4 as highly relevant to knowledge related to delirium); 2. Evaluate each section with regards to quality of content; 3 Identify does the information relevant to clinical practice for nurses; 3. Provide feedback on the overall clarity and comprehensiveness of the program; and 4. Provide comments or suggestions to improve the program.

Thank you for your time.

Sincerely,

Meredith Padilla, RN

Appendix L Delirium Education Program Expert's Rating Form

Rating Instructions: For topic section, please indicate the following two things:

To what extent were the objectives met.

1= Poor

2= Fair

3= Good

4= Very Good

5=Excellent

Quality of content of each section

1= Poor

2= Fair

3= Good

4= Very Good

5=Excellent

How relevant each topic to clinical practice of nurses by placing a number in the first box to the right of the item.

1= Not Relevant at All

2= Slightly Relevant

3= Moderately Relevant

4=Highly Relevant

The topics are as follows:

Definition of Delirium

Clinical Features

Pathophysiology

Delirium and Dementia

Clinical Subtypes

Risk Factors

Differential Diagnoses

Tools for the Assessment of Delirium

Prognosis

Management of Delirium

Provide comments or suggestions to improve each topic section of the education program.

For overall evaluation, provide feedback on the overall clarity and comprehensiveness of the program.

Delirium Education Program Expert's Rating Form

	Excellent 5	**Very Good 4**	**Good 3**	**Fair 2**	**Poor 1**
To what extent were objectives met.					
Quality of content					
Relevance to Clinical Nursing Practice	**Highly Relevant 4**	**Moderately Relevant 3**	**Slightly Relevant 2**	**Not Relevant at all 1**	
How relevant each topic to clinical practice of nurses by placing a number in the first box to the right of the item:					
Definition of Delirium					
Clinical Features					
Pathophysiology					
Delirium vs Dementia					
Clinical Subtypes					
Risk Factors					
Differential Diagnoses					
Tools for the Assessment of Delirium					

Prognosis					
Management of Delirium					
Overall rating of the program – overall clarity and comprehensiveness					
Provide comments or suggestions to improve each topic section of the education program. Please refer to specific topic above by indicating the corresponding letter.					
Provide comments or suggestions to improve the program					

Appendix M Nursing Delirium Scale (NuDESC)

	Descriptors			Score
	0	1	2	
Disorientation	alert, oriented to person, place, time	disoriented but easily reoriented	disoriented x2-3, not easily oriented	
Inappropriate Behavior	calm, cooperative	restless, cooperative	agitated, pulling devices, climbing over side rails	
Inappropriate Communication	Appropriate	Unclear thinking, rambling speech	Incoherence, nonsensical or unintelligible speech	
Illusions/Hallucinations	None noted	Paranoia, fears	Hallucinations, distortions of visual objects	
Psychomotor Retardation	None	Delayed or slow responsiveness	Excessive sleeping, somnolent, lethargic	
NuDESC Score	Positive Delirium - Score ≥ 2 (Take action!)			
	Negative Delirium – Score <2 (Continue to monitor)			2

Note: Adapted from Gaudreau et al, 2005.

Permission to use Nursing Delirium Scale (NuDESC)

Oct 26 at 1:26 PM
Pierre Gagnon <Pierre.Gagnon@crchudequebec.ulaval.ca>
To Padilla, Meredith marc-andre.roy@crulrg.ulaval.ca jean-david.gaudreau.1@ulaval.ca
CC Meredith Padilla Joanie Le Moignan
Oct 27 at 11:15 AM

Dear Ms. Padilla,

It is ok with me.

Thanks and good luck.

Kind regards,
Pierre R. Gagnon, **MD, FRCPC**
Psychiatrist specialized in Psycho-oncology
Professor, Faculty of Pharmacy, Université Laval
Director, Research Team in Palliative Care
CHU de Québec- Hôtel-Dieu de Québec
Department of Psychiatry, Psychosomatic Service
Maison Michel-Sarrazin and Institut universitaire en santé mentale
Laval University Cancer Research Center
Mailing address :
Dr Pierre R. Gagnon
L'Hôtel-Dieu de Québec – CHU
Psycho-oncologie
11, Côte du Palais
Québec, Québec, G2R 2J6 Canada
Tel. : 418-525-4444 #15808 Fax : 418-691-5019 email : pierre.gagnon@crhdq.ulaval.ca

De : Padilla, Meredith [mailto:padill24@unlv.nevada.edu]
Envoyé : 26 octobre 2015 16:27
À : marc-andre.roy@crulrg.ulaval.ca; jean-david.gaudreau.1@ulaval.ca; Pierre Gagnon
Cc : Meredith Padilla
Objet : NuDESC permission to use

Hi Dr. Marc-André Roy, Dr. Jean-David Gaudreau, Dr. Pierre Gagnon, et al.,Greetings from

California, USA. I am currently a student at the University of Nevada Las Vegas, USA taking

Doctorate in Nursing Research. My research study is on Delirium Education for Critical Care

Nurses. I am developing and evaluating a Delirium Education Program for CCU nurses and its

effect on the knowledge and self-confidence in recognizing delirium early. In connection with this, I would like to ask permission from the team (you) who developed The Nursing Delirium Screening Scale for me to use it in my study. I am doing the study at large community hospital in Southern California.

Thank you for looking into my concerns.
Sincerely,
Meredith Padilla, MSN, RN

Appendix N Case Vignettes

Permission to Use Delirium Case Vignettes

from: **DONNA MARIE FICK** <dmf21@psu.edu>

to: Meredith Padilla <padill24@unlv.nevada.edu>

cc: sharon inouye <sharon.inouye@yale.edu>,
Joanie Tan <yxz10@psu.edu>,
DONNA MARIE FICK <dmf21@psu.edu>

date: Wed, Mar 25, 2015 at 12:59 PM

subject: Re: Delirium case vignettes

: Important mainly because it was sent directly to you.

Hi Meredith,

Joanie Tan (copied here) will send them to you with the answer sheet. They are scored by percent correct and by case. They also contain open ended questions. They can be accessed on-line too at the Portal of on-line geriatric education http://www.pogoe.org/

You are welcome to use them and/or adapt them. Please cite the Journal of Gerontological Nursing 2007 article when using them or if publishing work from their use. Good luck with your doctoral work.

Kind regards-Donna

Case 6: Case Vignette Developed by the Researcher

John is a 74-year-old male who has been in the hospital x 3 days due to sepsis/pneumonia. According to her family, he has had increasing memory problems over the past year, no history of depression, sadness, or feeling blue. Currently on mechanical ventilation, one vasopressor for BP support, and sedation weaning started on the previous shift.. John has been calm and you plan to discontinue sedation and see how he does. He suddenly becomes agitated, tries to get out of bed, tries to pull his ET tube and lines, and doesn't seem to listen. Doesn't follow commands.

Questions:

Do you think this patient has experienced an acute change in mental status?

☑ Yes ❑ No

Please choose one answer form the choices below regarding what you think is happening to this patient

❑ Dementia

❑ Delirium – ❑ hypoactive ❑ hyperactive ❑ mixed

☑ Delirium superimposed with dementia

❑ hypoactive ☑ hyperactive ❑ mixed

❑ Normal aging

❑ None of the above

Appendix O Interview Guide Questions

Introduction:

Hi. I am Meredith Padilla and I am currently conducting a study on the lived experiences of nurses of the delirium education program. I want to make sure that you signed the consent form and emailed it. (Double check the checklist of names that submitted the consent form). Thank you for choosing to participate in this study. This interview will focus on your experiences of the delirium education program. Your response to these questions will be highly beneficial to the success of this research study. Please answer them the best as you can. There is no right or wrong answers.

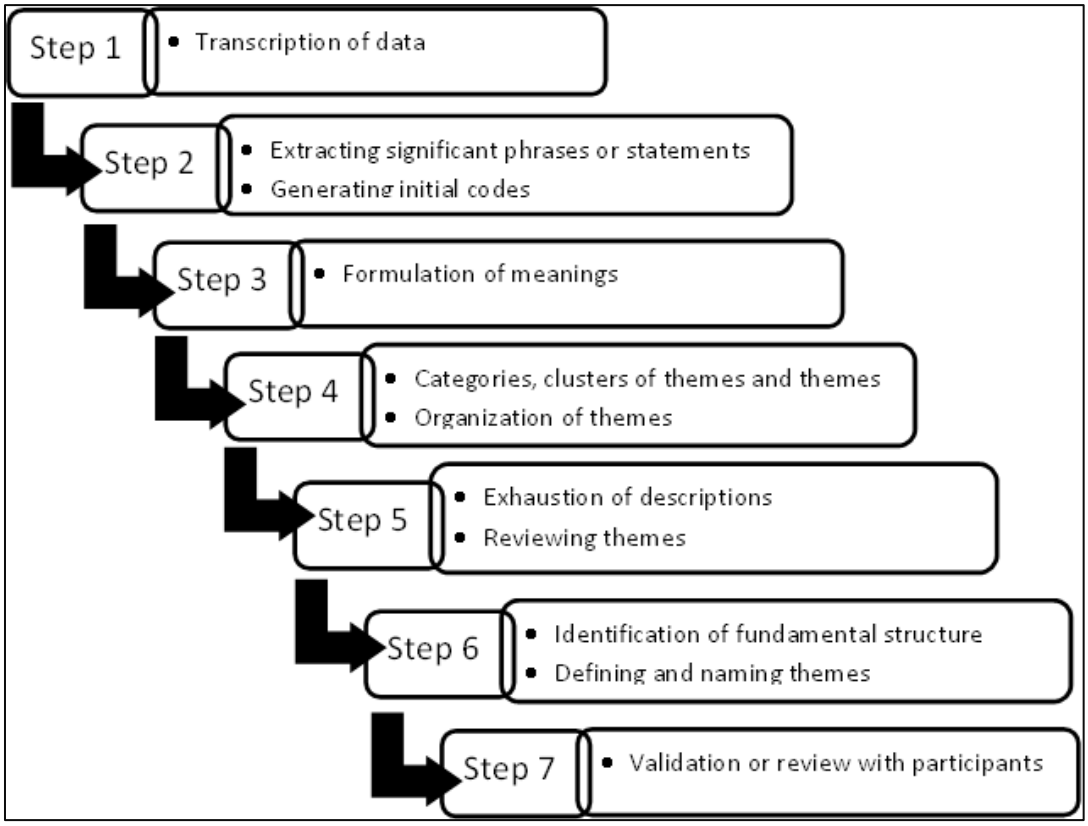
1. What are your experiences in caring for patients with delirium?
2. How was the Delirium Education Program (DEP)? Can you please tell me more about your experiences of the DEP?
3. How do you describe the DEP?
4. What are your thoughts about the DEP?
5. How do you feel about the DEP?
6. How did you feel after attending the DEP?
7. What do you expect in a DEP?
8. What does the DEP mean to you?
9. In your Delirium Knowledge Test, you answered ___ on question number ___ (questions with wrong answer). Can you tell me more about ___?
10. Tell me a little more about the DEP, you noted you were not clear on that part, can you tell me more about that?

11. With regards to the self-confidence test, you circled ___ in question ____ (low confidence/high confidence score if present), can you tell me more about that?
12. Do you have any recommendations that you would like to make related to the DEP?
13. Do you have anything else to add?

Probes to further the dialogue (if needed)

1. Would you like to share an example of that?
2. Can you please elaborate more on that to help me understand what you mean?
3. What did that mean to you?
4. Would you like to share what you are thinking?
5. Would you tell me a story or an event or an example that will help me understand what you mean?
6. Do you recall how your felt that time?
7. Do you recall your thoughts at that time?

Appendix P Summary of Colaizzi's Method of Phenomenological Data Analysis



Note: Adapted from Collaizi (1978)

Appendix Q Demographic Characteristics of Participants (Quantitative)

Variable	M	SD	Number	Percent
Age				
20 to <30 years			7	21.88%
30 to <40 years	38.1	9.65	12	37.50%
40 to <50 years			9	28.13%
Greater than or equal to 50 years			4	12.50%
Gender				
Male			1	3.13%
Female			31	96.87%
Race/Ethnicity				
White alone			19	59.38%
Black or African American			0	0%
Asian alone			8	25.00%
Native Hawaiian and other			2	6.25%
Two or more races			2	6.25%
Hispanic or Latino			1	3.13%
Education				
Associate Degree in Nursing			4	12.50%
Bachelor's Degree in Nursing			20	62.50%
Master's Degree in Nursing			8	25.00%
Doctorate Degree in Nursing			0	0%
Work Unit				
CCU alone			4	12.50%
CVICU alone			0	0%
Both CCU and CVICU			28	87.50%
Work Shift				
Day shift			23	71.88%
Night shift			9	28.13%
Type of Employee				

Full-time			21	65.63%
Part-time			11	34.38%
Nursing Experience				
< 2 years	31.70	5.57	1	3.13%
2 to <5 years			8	25.00%
5 to <10 years			8	25.00%
10 to <15 years			7	21.88%
Greater than or equal to 15 years			8	25.00%
Critical Care Experience				
< 2 years	21.95	5.63	3	9.38%
2 to <5 years			11	34.38%
5 to <10 years			8	25.00%
10 to <15 years			7	21.88%
Greater than or equal to 15 years			3	9.38%
Clinical Nurse Role				
Clinical Nurse I			21	65.63%
Clinical Nurse II			5	15.63%
Clinical Nurse III			3	9.38%
Clinical Nurse IV			3	9.38%
Experience in Caring for Patients with Delirium				
Yes			31	96.88%
No			1	3.13%

Note: M=mean; SD=standard deviation; N=32

Appendix R Demographic Characteristics of Participants According to Group (Quantitative)

Variable	Intervention Group		Control Group	
	n	%	n	%
Age				
20 to <30 years	5	31.25%	2	12.50%
30 to <40 years	4	25.00%	8	50.00%
40 to <50 years	6	37.50%	3	18.75%
Greater than or equal to 50 years	1	6.25%	3	18.75%
Gender				
Male	1	6.25%	0	0%
Female	15	93.75%	16	100.00%
Race/Ethnicity				
White alone	7	43.75%	12	75.00%
Black or African American	0	0%	0	0%
Asian alone	7	43.75%	1	6.25%
Native Hawaiian and other	0	0%	2	12.50%
Two or more races	2	12.50%	0	0%
Hispanic or Latino	0	0%	1	6.25%
Education				
Associate Degree in Nursing	2	12.50%	2	12.50%
Bachelor's Degree in Nursing	10	62.50%	10	62.50%
Master's Degree in Nursing	4	25.00%	4	25.00%
Doctorate Degree in Nursing	0	0%	0	0%
Work Unit				
CCU alone	3	18.75%	1	6.25%
CVICU alone	0	0%	0	0%
Both CCU and CVICU	13	81.25%	15	93.75%
Work Shift				
Day shift	12	75.00%	11	68.75%

Night shift	4	25.00%	5	31.25%
Type of Employee				
Full-time	11	68.75%	10	62.50%
Part-time	5	31.25%	6	37.50%
Nursing Experience				
< 2 years	1	6.25%	0	0%
2 to <5 years	3	18.75%	5	31.25%
5 to <10 years	5	31.25%	3	18.75%
10 to <15 years	2	12.50%	5	31.25%
Greater than or equal to 15 years	5	31.25%	3	18.75%
Critical Care Experience				
< 2 years	2	12.50%	1	6.25%
2 to <5 years	5	31.25%	6	37.50%
5 to <10 years	4	25.00%	4	25.00%
10 to <15 years	3	18.75%	4	25.00%
Greater than or equal to 15 years	2	12.50%	1	6.25%
Clinical Nurse Role				
Clinical Nurse I	8	50.00%	13	81.25%
Clinical Nurse II	4	25.00%	1	6.25%
Clinical Nurse III	2	12.50%	1	6.25%
Clinical Nurse IV	2	12.50%	1	6.25%
Experience in Caring for Patients with Delirium				
Yes	16	100.00%	15	93.75%
No	0	0%	1	6.25%

Note: Intervention group N=16; Control group N=16

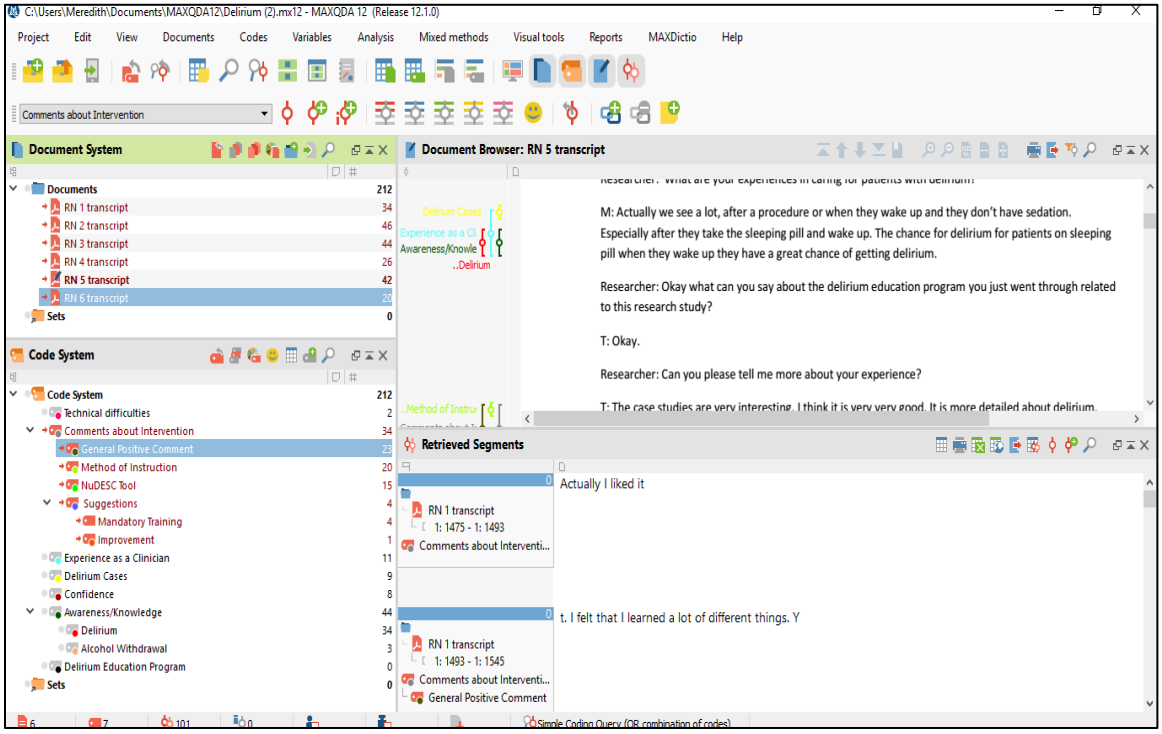
Appendix S Demographic Characteristics of Participants (Qualitative)

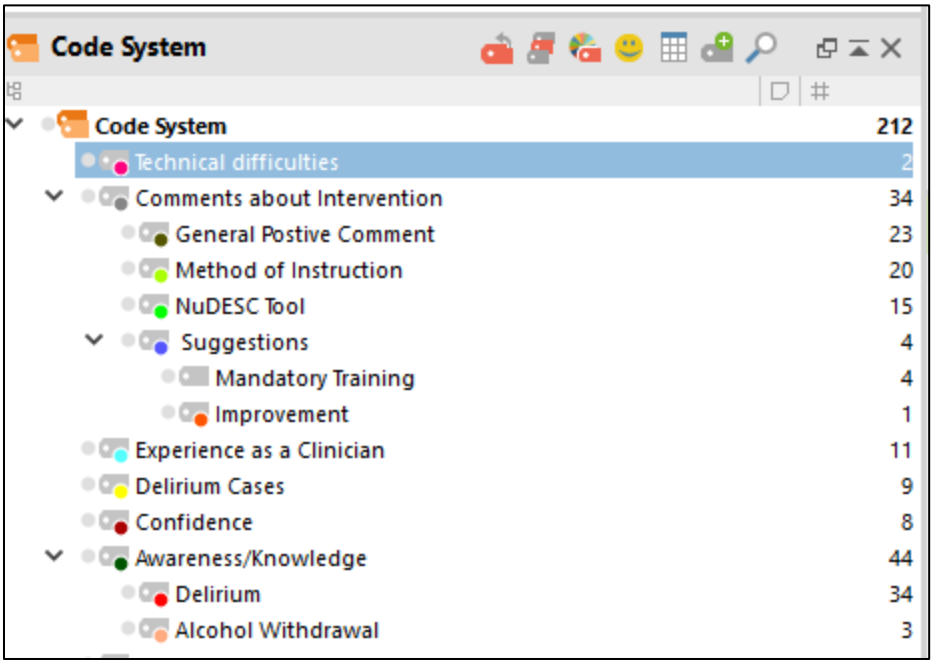
Variable	Number	Percent
Age		
20 to <30 years	0	0.00%
30 to <40 years	2	33.33%
40 to <50 years	4	66.67%
Greater than or equal to 50 years	0	0.00%
Gender		
Male	0	0.00%
Female	6	100.00%
Race/Ethnicity		
White alone	2	33.33%
Black or African American	0	0.00%
Asian alone	4	66.67%
Native Hawaiian and other	0	0.00%
Two or more races	0	0.00%
Hispanic or Latino	0	0.00%
Education		
Associate Degree in Nursing	0	0.00%
Bachelor's Degree in Nursing	4	66.67%
Master's Degree in Nursing	2	33.33%
Doctorate Degree in Nursing	0	0.00%
Work Unit		
CCU alone	1	16.67%
CVICU alone	0	0.00%
Both CCU and CVICU	5	83.33%
Work Shift		
Day shift	5	83.33%
Night shift	1	16.67%
Type of Employee		

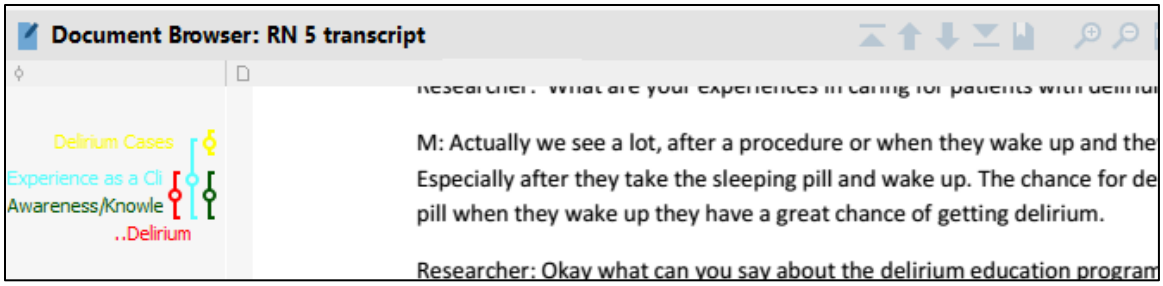
Full-time	3	50.00%
Part-time	3	50.00%
Nursing Experience		
< 2 years	0	0.00%
2 to <5 years	1	16.67%
5 to <10 years	1	16.67%
10 to <15 years	1	16.67%
Greater than or equal to 15 years	3	50.00%
Critical Care Experience		
< 2 years	1	16.67%
2 to <5 years	1	16.67%
5 to <10 years	0	0.00%
10 to <15 years	3	50.00%
Greater than or equal to 15 years	1	16.67%
Clinical Nurse Role		
Clinical Nurse I	1	16.67%
Clinical Nurse II	3	16.67%
Clinical Nurse III	0	0.00%
Clinical Nurse IV	2	33.33%
Experience on Patients with Delirium		
Yes	6	100.00%
No	0	0.00%

Note: N=6

Appendix T Coding in MAXQDA[12]

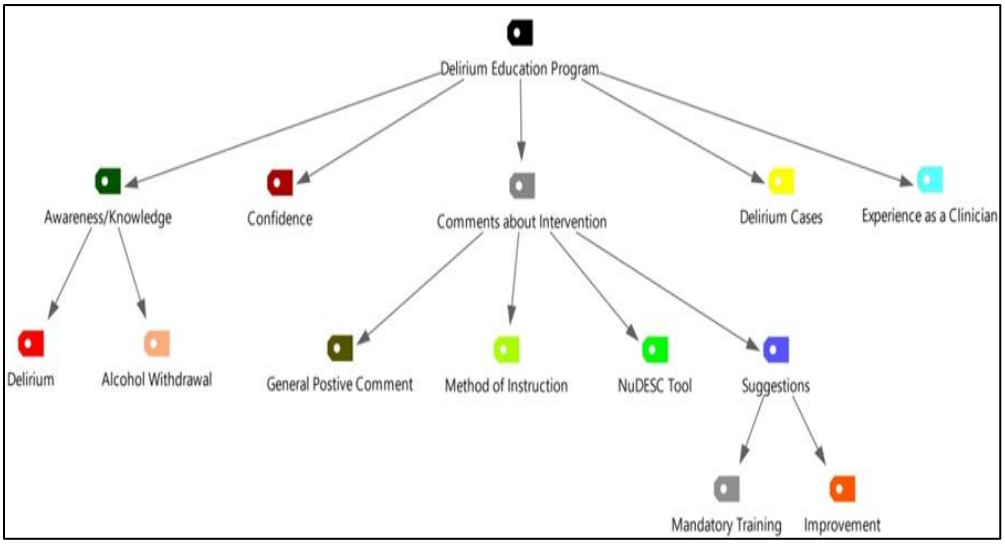




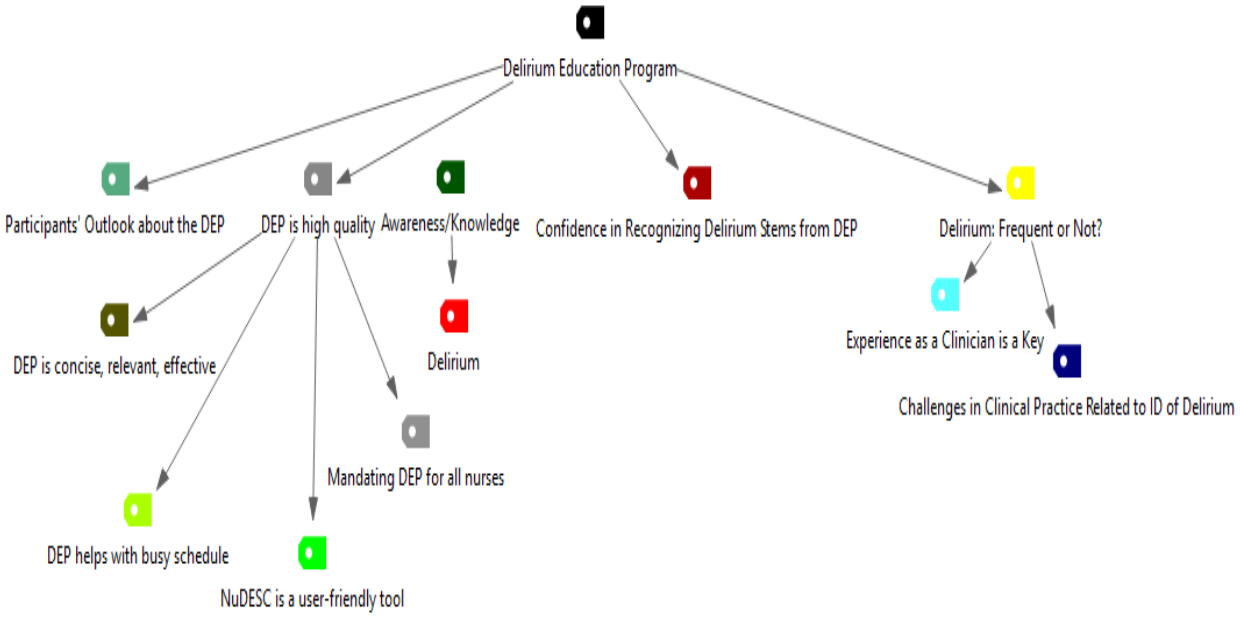


Coded segments

Color	Comment	Document group	Document name	Code	Begin	End	Weight score	Segment
			RN 1 transcript	Comments about Intervention	1: 1475	1: 1493	0	Actually I liked it
			RN 1 transcript	Comments about Intervention	2: 82	2: 126	0	I think going over the case study was great.
			RN 1 transcript	Comments about Intervention	2: 304	2: 327	0	It was clear and direct.
			RN 1 transcript	Comments about Intervention	3: 3	3: 167	0	But I just want to see it...involved...or come to fruition into our unit specially the tool. That we will be using that scoring system because it will really help us.
			RN 1 transcript	Comments about Intervention	3: 412	3: 662	0	I fell that the powerpoint that you put together and then the case studies, that was great. I don't think you need to improve it but I think it would be great if we could just actually put it into practice, start using it and also use the tool.
			RN 1 transcript	Comments about Intervention	3: 768	3: 859	0	: I was referring to the PowerPoint, case studies and the tool which was very easy to use.
			RN 2 transcript	Comments about Intervention	2: 3	2: 143	0	It was not complicated, not time consuming either. I loved that it is an online training mixed with case studies something like hands on.
			RN 2 transcript	Comments about Intervention	2: 518	2: 570	0	It made sense; it reminds me of what I deal everyday
			RN 2 transcript	Comments about	4: 3	4: 246	0	Yes, I the delirium education and case studies were helpful



Appendix U Thematic Map



Appendix V Key Terms, Definitions, and Sources

Term	Definition	Recent Sources
Clinical Vignettes	Conceptual: These are patient-related cases and scenarios that have educational value. Operational: Delirium-related patient cases and scenarios	Fick, Hodo, Lawrence, & Inouye, 2007
Delirium	Conceptual and Operational: Delirium is an altered state or disturbance of consciousness with inattention and changes in cognition that develops over a few hours or days and fluctuates over time.	Delirium, n.d.; Hare et al., 2008; Huang et al., 2012; Thomas et al., 2012
Role Playing	Conceptual: A dramatic technique that encourages students to improvise behaviors illustrating expected actions of persons involved in a specific situation. Role playing: "A teaching method that has been used widely for experiential learning" and that "provides an imaginary context in which issues and behaviors may be explored by participants who take on a specific role or character". Operational: Role is assigned to the nurse to test his/her problem	Levitt, 2010 Ching, 2014, p. 295

	solving capabilities using a dramatic technique during the role playing activity.	
Critical Care Nurses	Conceptual: Nurses who work either day or night shift in the critical care unit. Operational: Nurses who work either day or night shift in Coronary Care Unit (CCU) and/or Cardiovascular Intensive Care Unit (CVICU) of a community hospital.	Hospital standard of care
Nursing knowledge	Conceptual: Nursing knowledge related to the appropriate nursing intervention or patient care delivery based on nursing process.	Hare et al., 2009
	Operational: Nursing knowledge will be defined as the mean scores obtained by participants on the Nursing Knowledge of Delirium (NKD) questionnaire.	Hare et al., 2009
Risk Factors	Conceptual and Operational Risk factors divided into two groups namely, predisposing and precipitating.	
	Predisposing risk factors are patient characteristics that increase their likelihood of developing delirium and are usually nonmodifiable. These are: advanced age, pre-	Andrejaitiene, & Sirvinkas, 2012; Balas et al., 2015; Barr et al.,

	existing cognitive impairment or dementia, vision/hearing impairment, history of alcohol abuse, severity of illness, functional impairment, and depression. Precipitating factors are more modifiable and are probably secondary or associated to environmental factors or the patient's acute illness. These include acute illness, medications (dopaminergics, anticholinergics, and benzodiazepines), environmental factors, sleep deprivation, infection or sepsis, metabolic disturbance, immobilization, post-cardiac surgery, use of physical restraints, pain, dehydration, anxiety, lack of sleep, fractures or hip surgery, and primary neurologic diseases.	2013; McCusker et al., 2011; Deschodt et al., 2012; Desai, Chau, & George, 2013; Godfrey et al., 2013; Grover et al., 2013; Inouye, Westendorp, & Saczynstki, 2014; Koster, et al., 2011; Mangusan, Hooper, Denslow, & Travis, 2015; McCusker, et al., 2013; National Institute for Health and Care Excellence (NICE), 2010; Rothberg et al, 2013; Steiner, 2011; Thomas et al, 2012; Zaal & Slooter, 2012
Self-Confidence	Conceptual: Person's "trust or belief in his or her ability to function as a professional nurse." A value judgment of a person's willingness to carry out	Adamson, Kardong-Edgren, & Willhaus, 2013; Kardong, & Fitzgerald, 2010

appropriate actions or task relative to the risk of the event or situation.	
Operational: Self-confidence will be defined as the mean scores obtained by participants on the Confidence Scale (C-Scale).	Grundy, 1993

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Yevchak, A., Steis, M., Diehl, T., Hill, N., Kolanowski, A., & Fick, D. (2012). Managing delirium in the acute care setting: a pilot, focus group study. *International Journal of Older People Nursing 7,* 152–162 doi:10.1111/j.1748-3743.2012.00324.x

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Curriculum Vitae

Meredith Padilla, MSN, RN, CCRN, CCRN-CMC, CCRN-CSC
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Education

2012 – present University of Nevada, Las Vegas
4505 S. Maryland Pkwy.
Las Vegas, NV 89154
Doctoral Student in Nursing Research and Education
Expected Graduation: Spring 2016

2006 - 2010 California State University Dominguez Hills
1000 East Victoria, Carson, CA 90747
Master's Degree in Nursing: Nurse Educator

2002-2004 University of Perpetual Help of Laguna
Binan, Laguna, Philippines
Bachelor of Science Major in Nursing

1998-1999 St. Dominic Savio College
Caloocan City, Philippines
Additional Course: Biostatistics

1995-1996 De La Salle University Medical Center
Dasmarinas City, Cavite, Philippines
Medical Internship

1991-1995 De La Salle University College of Medicine
Dasmarinas City, Cavite, Philippines
Postgraduate, College of Medicine
Doctor of Medicine

1988-1991 De La Salle University, Manila, Philippines
Additional Science Units

1981-1986 De La Salle University, Manila, Philippines
Bachelor of Arts Major in Psychology
Bachelor of Science Major in Business Management
Jose Rizal Academic Honors Award

License/Exams:

Certification Exam in Cardiac Medicine (CCRN-CMC)
Certification Exam in Cardiac Surgical Nursing (CCRN-CSC)

NIH Stroke Scale Certification
Protecting Human Research Participants Training/Certification
BLS/ACLS Licenses
Certification Exam for Adult Critical Care Registered Nurse (CCRN)
NCLEX-RN, California Board of Nursing
Philippine Nursing Licensure Examination
Philippine Medical Licensure Examination

Training:
AHRQ TEAM STEPPS Instructor Training
Care for Post-op Cardiac Surgery (CABG/valve replacement) Patients
Continuous Renal Replacement Therapy (CRRT)
High Fidelity Simulation Training
Hypothermia Protocol (Arctic Sun)
Intraaortic Balloon Pump (IABP)
Impella Cardiac Assist Device
Prone Therapy: Rotoprone Therapy
Health Stream Learning Management System – Online Competencies/Administrator

Work History:
February 2014 – current
Hoag Hospital (Magnet Hospital
Address: 1 Hoag Drive, Newport Beach, CA 92663

August 2015-current
Job title: Educator Coordinator II
Cardiovascular Service Line & Critical Care Service Line

April 20, 2015-current
Job title: Interim Educator Coordinator II
Cardiovascular Services Line & Critical Care Services

- Oversight, develops and implements orientation programs related to new staff/transfers/promotion
- Oversight, develops and implements evidence-based educational programs to maintain competencies of nurses in the Intensive Care Units (Cardiothoracic ICU, Cardiac ICU, Sub-ICU, Cardiovascular Service Line
- Ensures optimal patient care in collaboration with key leaders through the use of evidence based, clinical best practice guidelines and models, continuous process improvement measures.
- Acts as a clinical resource and a role model for all areas – cardiovascular, cardiothoracic and critical care
- Instructor and Case Scenario Programmer – High Fidelity Simulation
- Educates staff didactic and hands-on/ bedside based on regulatory guidelines by Department of Health, DNV, California Board of Registered Nursing, and other regulatory agencies

- Critical Care Course, Nursing/New Hire Orientation, Cardiac Surgery Course, IABP, Rotoprone, CRRT, Impella
- BLS and ACLS Instructor
- Mentors and coaches clinical nurses in advancing to the clinical ladder program
- Member of the following committees: Cardiovascular Collaborative, Cardiac Surgery Collaborative, Critical Care Services Committee, Rapid Response Council, Skin Committee, Medications Committee, Collaborative Committee, IT Committee, Skin Committee, Standardized Procedures Committee, Clinical Team Effectives – Renal Failure Patients Committee, Educator Collaborative, Sepsis/RRT Collaborative

February 2014-April 19, 2015
Hoag Hospital Irvine
Address: 16200 Sand Canyon, Irvine, CA 92618
Job title: Intensive Care Clinical Nurse
Responsibilities:

- Clinical care of critically ill patients

February 2007 – November 2013
Mission Hospital (Magnet Designated Hospital 2012)
Address: 27700 Medical Center Road, Mission Viejo, CA
February 2009 – November 2013
Job title: Manager Professional Education
Responsibilities:

- Responsible for the strategic development and oversight of professional educational programs to meet the regulatory guidelines of The Joint Commission, Center for Medicare/Medicaid Services (CMS), Department of Health, California Board of Nursing, and other related regulatory agencies. Oversight and sits in the Joint Commission, CMS and government agencies' surveys.
- Signatory for the hospital's California Board of Nursing continuing education units
- Develops, organizes and delivers educational programs/workshops, symposium deemed required or necessary as they arise
- Ensures optimal patient care in collaboration with key leaders through the use of evidence based, clinical best practice guidelines and models, continuous process improvement measures.
- Collaborates with patient safety, quality and risk management to improve patient outcomes through education programs for staff
- Provides feedback during Interdisciplinary Committee meetings mostly related to physicians and nurse practitioners' roles, responsibilities and scope of practice
- Leads and coaches clinical nurses in developing innovative plans for professional education in the House-wide Education Council

Job title: Cardiovascular Service Line Clinical Nurse Educator
Responsibilities:

- Oversight develops and implements evidence-based educational programs to maintain competencies of nurses in the Intensive Care Units (Cardiothoracic ICU, Medical/Neuro ICU, Cardiac Telemetry, Same Day Care Unit, and Cardiovascular Lab, Ensures optimal patient care in collaboration with key leaders through the use of evidence based, clinical best practice guidelines and models, continuous process improvement measures.
- Acts as a clinical resource and a role model for all areas – cardiovascular, medical and stroke patients
- Lead Instructor and Case Scenario Programmer – High Fidelity Simulation
- Organizes symposia: Cardiac Symposium, Pulmonary Symposium, Nursing Symposium
- Educates staff didactic and hands-on/ bedside based on regulatory guidelines by Department of Health, The Joint Commission, Center for Medicare and Medicaid, California Board of Registered Nursing, and other regulatory agencies
- BLS and ACLS Instructor

Executive Director: Linda Standiford (949-364-1400)

February 2007-February 2009
Job title: Cardiac/Medical Intensive Care RN – care of critically ill patients in the CICU, post cardiac surgical patients, intraaortic balloon pump, CRRT, rotoprone, hypothermia, and others.
Manager: Deanne Niedziela (949-364-1400 x 4384)

November, 2005 – February 2007
Huntington Beach Hospital, ICU
Address: 17772 Beach Boulevard, Huntington Beach, CA 92647
Job title: Intensive Care RN – care of critically ill patients in the medical ICU.

2002-2005 Medical Practice, Philippines

Affiliations/Memberships:
Member, American Association of Critical Care Nurses (AACN), AACN, Greater Long Beach Chapter
Member, Sigma Theta Tau International Honors Society, Xi Theta Chapter
Critical Care Unit Representative to Mission Hospital's UTI Task Force 2008-2009
Mission Hospital CICU, Cardiac Telemetry, Cath Lab, Same Day Care Education Councils Mentor/Coach
Adviser, Mission Hospital Housewide Education Council
Coach, Mission Hospital Housewide Education Council, Professional Development Workgroup
Member: Mission Hospital Research Council, Cardiovascular Leadership Council, Critical Care Committee, Code Blue Committee, Moderate Sedation Committee, High Fidelity Simulation Committee (Lead Instructor), Interdisciplinary Committee, Inpatient Diabetes Education Committee, Coordinating Council, Leadership Council

Other Achievements:
Oversight and developed the Cardiac Surgical Nursing Program for Intensive Care Nurses and Telemetry Nurses. Lead instructor and module developer of Cardiac Surgical Nursing Program modules and classes

Developed, organized and initiated an evidence-based Inpatient Diabetes Education plan and implementation involving stakeholders, bedside nurses (June 2013)

Developed CAUTI prevention bundles used house-wide (instrument/tool developed from poster presented at the Sigma Theta Tau International Honor Society of Nursing) (2009)

Lead of Blood Stream Infection Prevention Project – Intensive Care Unit, Cardiac Telemetry which dramatically decreased the blood stream infection rate of the intensive care unit by almost 60% which then became a housewide project

Assisted in the planning and delivery of education to new staff of a newly acquired hospital – Mission Hospital Laguna Campus (2009) - clinical orientation

Assisted in the development and delivery of education to the New Tower 2 Transition (2010)

Clinical Educator for Intensive Care Units (CICU & ICU) and other cardiovascular service line units: Cardiac Telemetry, Cardiovascular Lab, Same Day Care, Cardiology, Cardiac Rehabilitation

Advanced Hemodynamic/EKG/Dysrhythmia Instructor, BLS Instructor, ACLS Instructor

Spearheaded/mentored Symposiums: Pulmonary Disorders Symposium, Cardiovascular Symposium, Nursing Symposium 2012

New Graduate/Transition RN Training Program

Patient Care Technicians Training Program

Preceptor/Mentor: BSN/MSN students

Lead Instructor: High Fidelity Simulation Training Program

Writer/co-writer for Magnet documents submitted by the hospital in Fall 2011.

Hospital's Community Project involvement: Teaching high school students an overview of nursing (JSerra Program; Summer Camp); Summer Camp 2012