

KNOWLEDGE, PERCEPTIONS, AND ATTITUDES
OF CRITICAL CARE NURSES TOWARDS THE COMPREHENSIVE UNIT-BASED
SAFETY PROGRAM FOR MECHANICALLY VENTILATED PATIENTS
IN PREVENTING VENTILATOR-ASSOCIATED EVENTS

by

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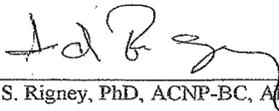
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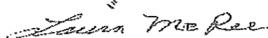
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As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Jeremiah Opiniano Ramirez-Damilig entitled "Knowledge, Perceptions, and Attitudes of Critical Care Nurses Towards the Comprehensive Unit-Based Safety Program for Mechanically Ventilated Patients in Preventing Ventilator-Associated Events (CUSP 4 MVP-VAP)" and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.



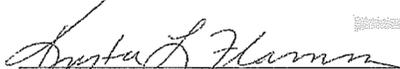
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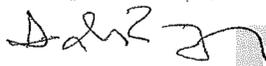


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Final approval and acceptance of this DNP project is contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College.

I hereby certify that I have read this DNP project prepared under my direction and recommend that it be accepted as fulfilling the DNP project requirement.



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TABLE OF CONTENTS

ABSTRACT	6
INTRODUCTION.....	9
Problem Statement and Significance	9
Purpose	12
Research Question	12
FRAMEWORK & SYNTHESIS OF EVIDENCE	13
Theoretical Framework	13
Concepts	14
Synthesis of Evidence	15
METHODS	18
Design	18
Ethical Considerations	19
Respect for Persons	19
Beneficence	20
Justice	20
Setting	20
Participants	21
Data Collection	21
Data Analysis	22
RESULTS	23
Description of the Participants	23
Knowledge Assessment	24
Perceptions and Attitudes of Nurses of the CUSP 4 MVP-VAP	25
SUMMARY	26
STUDY STRENGTHS	27
STUDY LIMITATIONS	27
RECOMMENDATIONS FOR PRACTICE	27
APPENDIX A: EVALUATION TABLE.....	28
APPENDIX B: DISCLAIMER.....	38
APPENDIX C: NOT HUMAN SUBJECTS RESEARCH DETERMINATION FORM...41	41
APPENDIX D: SITE APPROVAL LETTER	43
APPENDIX E: SURVEY.....	45
REFERENCES.....	51

LIST OF TABLES

TABLE 1.	Demographic Characteristics of Participants	54
TABLE 2.	Knowledge of Critical Care Nurses of the CUSP 4 MVP-VAP	56
TABLE 3.	Descriptive Statistics for Knowledge Assessment of the CUSP 4 MVP-VAP ...	58
TABLE 4.	Perceptions and Attitudes of Nurses of the CUSP 4 MVP-VAP	59
TABLE 5.	Perceptions and Attitudes of Nurses of SAT, SBT, RASS, and CAM-ICU.....	61
TABLE 6.	Perceptions and Attitudes of Nurses of the ABCDE Bundle and Early Mobilization Program	62
TABLE 7.	Spearman Correlation Coefficient of Knowledge Scores and Demographic Profile of Participants	63
TABLE 8.	Spearman Correlation Coefficient Between Perception and Attitude of Nurses and Demographic Profile	64
TABLE 9.	Spearman Correlation Coefficient Between Knowledge and Perception and Attitude of Nurses	65
TABLE 10.	Spearman Correlation Between Total Number of Years as ICU RN and Perceptions and Attitudes of Medical-ICU Day Shift Nurses of the CUSP 4 MVP- VAP	66
TABLE 11.	Spearman Correlation Between Knowledge and Total Number of Years as a Nurse	67
TABLE 12.	Spearman Correlation Between Level of Education of Cardiovascular ICU Nurses and Perception and Attitudes of the CUSP 4 MVP-VAP	68

ABSTRACT

Background: Mechanical ventilation provides respiratory support for critically ill patients and is one of the most significant life-saving advancements in medical science and technology. Patients on mechanical ventilation are at high risk for complications, such as ventilator-associated pneumonia (VAP), sepsis, Acute Respiratory Distress Syndrome (ARDS), pulmonary embolism, barotrauma, and pulmonary edema (CDC, 2017). The comprehensive unit-based safety program for mechanically ventilated patients, also known as CUSP 4 MVP –VAP, is a collaborative program funded by the Agency for Healthcare Research and Quality (AHRQ) that uses the CUSP principle (AHRQ, 2017). The CUSP principle employs clinical best practices to decrease complications from mechanical ventilation, improve patient safety, clinical outcome, and promote safety culture (AHRQ, 2017). Healthcare organizations who participated in this project reported a significant decrease in VAE rates (AIPSQ, n.d.).

Objective: The purpose of this DNP Project is to assess the knowledge of critical care nurses of the evidence based interventions contained in the CUSP 4 MVP-VAP for preventing VAEs and their perceptions and attitudes about safety culture in the work area. The results of this project will allow the project team to understand potential barriers to implementation and provide opportunities to address concerns and needs of critical care nurses who play a significant role in the implementation of CUSP 4 MVP-VAP.

Design: This DNP project used a quantitative, descriptive and correlational study to assess knowledge, perceptions, and attitudes of critical care nurses of the comprehensive unit-based safety program, for mechanically ventilated patients or the CUSP 4 MVP-VAP.

Setting: The study was conducted at two facilities of Carondelet Health Network: the Carondelet Heart and Vascular Institute (CVHI) on St. Mary's campus and the medical-surgical ICU at St. Mary's hospital between October 18 to 25, 2017.

Participants: 71 ICU nurses at St. Mary's hospital in Tucson, AZ.

Measurements: A paper survey divided into three parts: demographic characteristics of participants, assessment of knowledge and perceptions and attitudes of nurses towards the new guidelines in the CUSP 4 MVP-VAP.

Results: Majority of the ICU nurses are female, held a bachelor's degree, full-time employee, staff RN in their current position, experienced and expert RN in their clinical competence, and between 40 to 59 years of age. The knowledge scores of ICU nurses were between 10 to 70% with no significant correlation with participant's demographic characteristics at α -level of 0.05. The ICU nurses has the least knowledge about selective PUD prophylaxis, followed by incorporating early mobility program for intubated patients, recommended frequencies of ventilator circuit changes, tracheal suctioning, and changing the HME. Although 50% of nurses use RASS to keep target sedation level of -1 to +1, only 46% of participants were aware that RASS is not the appropriate tool for assessment of delirium in intubated patients. In addition, only 48% of nurses were aware of the recommended low tidal volume ventilation for ARDS and non-ARDS. The study found no correlation between knowledge of nurses of the CUSP 4 MVP-VAP and perceptions and attitudes of nurses of the evidence-based practice (p -value .474).

Conclusion: Based on the study, the cardiovascular ICU and medical ICU at St. Mary's hospital require substantial need for educational improvement and cultural change. The unit should

develop their own CUSP team that will assist in creating a unit-based policies and procedures aligned to current evidence-based practice in preventing ventilator-associated events.

INTRODUCTION

Mechanical ventilation provides respiratory support for critically ill patients and is one of the most significant life-saving advancements in medical science and technology. More than 300,000 patients receive mechanical ventilation each year in the United States (Center for Disease Control [CDC], 2017). Patients on mechanical ventilation are at high risk for complications, such as ventilator-associated pneumonia (VAP), sepsis, Acute Respiratory Distress Syndrome (ARDS), pulmonary embolism, barotrauma, and pulmonary edema (CDC, 2017). Prior to 2013, the National Healthcare Safety Network (NHSN) surveillance system for ventilator-associated events was restricted to VAP (CDC, 2017). A healthcare-associated infection (HAI) prevalence survey report published in 2016 showed that VAP is the most common hospital-acquired infection (CDC, 2016). An average of 157,500 cases of healthcare-associated pneumonias were reported in acute care hospitals in the United States in 2011, and 39% were pneumonias related to mechanical ventilation (CDC, 2016). Complications from mechanical ventilation can lead to increase length of intensive care unit (ICU) and hospital stay, healthcare costs, mortality, and morbidity (CDC, 2017).

Problem Statement and Significance

Although mechanical ventilation is a life-saving intervention, it poses significant clinical and economic challenges due to risk of complications. Approximately 40% of mechanical ventilation lasts eight days or longer, and 20% of patients on mechanical ventilation develop VAP (AIPSQ, n.d.). The annual estimated cost for VAP is \$40,144 per incident, which accounts for 31.7% of the total annual costs of five major hospital-acquired infections at \$9.8 billion (Zimlichman et al., 2013). The mortality rate of mechanically ventilated patients with acute lung

injury ranges from 24% in persons aged 15-19 to 60% for persons aged 85 and older (CDC, 2017). The incidence of ventilator-associated events (VAEs) continues to be a challenge in the healthcare arena, and new research evidence warrants revision of VAE prevention guidelines.

The comprehensive unit-based safety program for mechanically ventilated patients, also known as CUSP 4 MVP –VAP, is a collaborative program funded by the Agency for Healthcare Research and Quality (AHRQ) that uses the CUSP principle (AHRQ, 2017). The CUSP principle employs clinical best practices to decrease complications from mechanical ventilation, improve patient safety, clinical outcome, and promote safety culture (AHRQ, 2017). The aim of the CUSP 4 MVP-VAP is to improve daily care processes, and promote early mobility and low tidal volume ventilation (AHRQ, 2017). Healthcare organizations who participated in this project reported a significant decrease in VAE rates (AIPSQ, n.d.). Several organizations in the Kingdom of Saudi Arabia who joined the program found a significant improvement in bundle compliance from 48.6% to 94.3%, a decreased in VAP incidence from 9.4 to 3.1 cases per 1,000 ventilator days and an average of 66% VAP reduction (Khan et al., 2017). VAE cases are preventable with using the best research evidence available, and reduction in VAE rates can yield potential savings of \$40,000 per incidence of VAP alone (Khan et al., 2017). In addition, successful prevention of VAE incidence can reduce ICU and hospital stay; decrease long-term physical, cognitive, and psychological harm to patients and family; improve hospital reimbursement and decrease healthcare costs (CDC, 2017).

Interventions involved in the CUSP 4 MVP-VAP can be a challenging task for critical care nurses. A recent survey in a teaching hospital in Italy found that only 34% of participants considered the Awareness and Breathing Coordination, Delirium Monitoring and Management

and Early Exercise/Mobility (ABCDE) bundle applicable in their unit; only 41.6% of the participants expressed awareness of the bundle, but 67% agreed with its potential capacity for improving patient outcomes (Pinto & Biancofiore, 2016). The survey also revealed that 71% of respondents believed the sedation awakening and breathing trial is easy to understand, and 80% found the Richmond Agitation-Sedation Scale (RAAS) and the Confusion Assessment Method (CAM) beneficial in assessing and monitoring delirium. However, 48% revealed that they do not utilize these tools (Pinto & Biancofiore, 2016). Another survey found 40% of participants did not screen patients for delirium and one-third did not use a sedation protocol on mechanically ventilated patients (Balas et al., 2012). The survey done by Pinto and Biancofiore (2016) revealed that 51% of participants reported that they were not aware of or had not used the exercise/mobility screening. In addition, Balas and colleagues (2012) found that the use of exercise and early mobility protocols in the ICU is lacking. Therefore, evaluation of current knowledge, perception, and attitude of nurses of VAE prevention must be performed prior to implementation of the CUSP 4 MVP-VAP program.

The ABCDE bundle provides a comprehensive approach to improving the care of mechanically ventilated patients. However, the bundle requires improved communication among ICU team members; high-quality, timely, and reliable accomplishment of independent tasks by trained individuals; and effective leadership that can adapt to the needs of the local ICU culture (Khan et al., 2017). The CUSP 4 MVP-VAP encourages creation of local unit-based multidisciplinary improvement teams (the CUSP teams) that would educate staff on the science of improving patient safety, identify local issues affecting clinical and operational context, help

bridge the gap between management and frontline staff, and provide resources for local interventions (Khan et al., 2017).

Purpose

The purpose of this DNP Project is to assess the knowledge of critical care nurses of the evidence based interventions contained in the CUSP 4 MVP-VAP for preventing VAEs and their perceptions and attitudes about safety culture in the work area. It is important to note that critical care nurses are uniquely positioned to successfully integrate initiatives for improving the quality of healthcare. One study found that despite the positive attitude of some nurses toward evidence-based practices, the majority had an average level of knowledge and skills about evidence-based practice (Shafiei, Baratimarnani, Goharinezhad, Kalhor, & Azmal, 2014). Some nurses also perceive such initiatives as a waste of time rather than a necessity in their professional practice (Shafiei et al., 2014). Pinto and Biancofiore noted that 53% of respondents reported that multidisciplinary rounds were not being conducted in their unit but judged multidisciplinary rounds as a positive activity (2016).

A substantial need for educational improvement and cultural change are essential in adopting evidence-based interventions to prevent VAEs (Pinto & Biancofiore, 2016). The results of this project will allow the project team to understand potential barriers to implementation and provide opportunities to address concerns and needs of critical care nurses who play a significant role in the implementation of CUSP 4 MVP-VAP.

Research Question

What is the current knowledge, perceptions and attitudes of critical care nurses about the evidence-based interventions included in the CUSP 4 MVP-VAP for preventing VAEs?

FRAMEWORK & SYNTHESIS OF EVIDENCE

Theoretical Framework

The theoretical framework that guide this DNP project is the social cognitive theory (SCT). The SCT describes psychosocial functioning with regards to triadic reciprocal causation (Bandura, 1988). This model explains that behavior and cognitive, personal and environmental factors are continuously interacting and influencing each other bidirectionally (Bandura, 1988). The four assumptions of SCT include developing competencies through mastery modeling, enhancing the beliefs of an individual to their own capabilities, and increasing self-motivation through goal systems (Bandura, 1988). It is important to note that the basic principle of SCT is that learning is internal and a goal-directed behavior (Bandura 1988).

According to Bandura (1988), modeling refers to behavioral, cognitive, and affective changes derived from one or more models that can create a motivational response, such as positive behavior toward a new initiative in practice. However, it can also create an inhibitory response that would increase the resistance of an individual to adopt new ideas or change. Even the provision of a prominent model will not automatically generate homogenous patterns of behavior in others (Bandura, 1971). The three major elements to produce the best results from modeling include: First, the appropriate skills are modeled to project the basic competencies. Second, individuals are presented with guided practice under simulated conditions so they can optimize the skills. Third, individuals are assisted in applying their newly learned skills in practice that will help them achieve their tasks and goals (Bandura, 1988). Individuals must experience a favorable outcome using what they have learned to believe in their capabilities and in the value of the new ways (Bandura, 1988). However, human competency not only requires

skills but also belief in self-efficacy by the individual (Bandura, 1971). Self-efficacy is self-judgment that one can successfully achieve the behavior required to produce a favorable outcome (Bandura, 1988). Self-efficacy can affect choice of behavior, effort, persistence, learning, and achievement (Bandura, 1988). Three types of motivators have been built around SCT: cognized goals, outcome expectations, and retrospective reasoning about perceived causes of success and failure (Bandura, 1988). Cognized goals provide a vital cognitive mechanism of motivation by directing oneself to challenging goals. Outcome expectation is motivation regulated by self-beliefs of efficacy that a particular behavior will lead to a favorable outcome, while causal attributions influence motivation, performance, and affective reactions (Bandura, 1988). Individuals with strong beliefs of self-efficacy attribute failures to insufficient effort, while individuals with weak beliefs of self-efficacy attribute failures to low ability (Bandura, 1988).

Concepts

Knowledge development in nursing discipline requires flexibility and innovation to understand how to achieve desired outcomes and effective interventions to achieve goals (Rodgers, 2005). Setting goals, such as preventing VAE incidence in the critical care unit, may provide a strong sense of motivation, purpose and direction among critical care nurses and can drive change. Nurses are capable of adopting standards, evaluating their own behaviors, arranging self-incentives and setting their own guides and motivators to achieve goals. However, nurses tend to seek basis to substantiate their decision to change a process in the ICU. Nurses readily adopt modeled ways if nurses see other providers similar to themselves solve a patient safety issue successfully with modeled strategies than if they perceived the models as very

distinct from themselves. It is also important to note that knowledge, perceptions, and attitudes are interrelated. The more training or knowledge people achieve, the higher the belief in their capabilities, the higher the goals they set for themselves, and the higher their commitment to achieving goals (Bandura, 1988). The beliefs of an individual about their capabilities can influence their perception, perseverance, and attitude toward new challenges and tasks.

Individuals with a strong sense of efficacy concentrate more on mastering tasks, set higher goals for themselves, and have coping capabilities to change (Bandura, 1988). On the other hand, low self-efficacy can impair motivation and the avoidance of new tasks or challenges. Self-beliefs of individual efficacy will determine how much effort individuals put in to accomplishing a task and how long they will persevere to better themselves and master the task they do (Bandura, 1988). Performance is measured against standards and serves as the basis for evaluating individual capabilities.

Social Cognitive Theory can provide a framework for designing, implementing and evaluating programs. SCT can describe the dynamic interaction of provider, behavior, and environment, and it examines multiple avenues to behavioral change, including environment, skills, and personal changes.

Synthesis of Evidence

In 2013, the National Healthcare Safety Network changed the surveillance definition from VAP to VAE to include infectious and non-infectious complications from mechanical ventilation (CDC, 2017). Due to the limitations of the VAP bundle and continuous evolution of research, the CUSP 4 MVP-VAP program was developed and initiated in 2014 and concluded in

2016. Thus, a more comprehensive approach, the CUSP 4 MVP-VAP, was introduced to improve the daily care process.

To establish what is known about the safety culture of critical care nurses and foundation of VAP bundle, a literature search was conducted in PubMed, Embase, and CINAHL using the following search terms: “ventilator-associated pneumonia”, “ventilator-associated events”, “ABCDE bundle”, and “CUSP 4 MVP-VAP”. These were limited to English language, human studies, published within the last five years, and adults aged 19 years and above. Nine relevant articles were found, which are presented in detail in Appendix A.

Out of nine articles, the study done by Pinto and Biancofiore (2016) is the only one that directly pertains to the CUSP 4 MVP-VAP; the other eight articles were studies prior to the implementation of the revised ABCDE bundle. The descriptive quantitative study done by Pinto and Biancofiore (2016) found that only 45 out of 108 critical care nurses (41.6%) reported awareness of the ABCDE bundle. The majority of respondents (71%) perceived the ABCDE bundle easy to understand, 80% judged the RAAS and the CAM for delirium assessment and monitoring useful, but 48% do not implement this tool in practice (Pinto & Biancofiore, 2016). With regard to early mobility, the survey found that 51% of respondents were not aware or not using the Exercise/Mobility Safety Screen tool. Although 67% of surveyed nurses agreed with the utility of the bundle, only 34% of respondents perceived the applicability of the evidence-based interventions at their own workplace (Pinto & Biancofiore, 2016). Threats to external validity of the study were identified: sample and setting characteristics. The sample study was limited to Italian nurses with more than 5 years of clinical experience. The number of years of experience in nursing and number of years in critical care should be taken into consideration

when assessing the knowledge, perceptions, and attitudes of critical care nurses about the ABCDE bundle. Also, the setting was limited to ICU in Italy which might have a different safety culture as compared to the United States. The investigators did not mention conducting a power analysis to estimate the sample size needed in their study, which increases the risk for Type II error.

Due to the limited available literature, studies completed prior to the implementation of the new initiatives for VAE prevention were appraised. A qualitative study using focus groups identified three main themes to describe a nurse's perception of evidence-based interventions in preventing three frequent adverse events in the ICU: VAP, pressure ulcer, and CLABSI (Soh, Davidson, Leslie, DiGiacomo, & Soh, 2013). These investigators found a nurse's knowledge of the change process, initial resistance, ambivalence and movement to acceptance, and hierarchal organizational structure can hinder the change process (Soh, Davidson, Leslie, DiGiacomo, & Soh, 2013). A descriptive study to assess knowledge of guidelines for VAP prevention found that healthcare workers with more than one year of ICU experience scored significantly higher in personal knowledge than providers with less experience ($p=0.004$) (Perez-Granda et al., 2013). A study in Taiwan found that non-ICU-licensed nurses and junior RNs lack knowledge of VAP prevention (Lin, Lai, & Yang, 2014). Similar studies conducted in Western Turkey, Croatia, and Yemen found that nurses' knowledge of evidence-based interventions in preventing VAP is poor (Al-Sayaghi, 2014; Korhan, Yont, Kilic, & Uzelli, 2014; Jordan et al., 2014). With regard to the early mobility component of the ABCDE bundle, 76% of nurses were found to believe that the potential risks outweighed the benefit of early mobilization (Jolley et al., 2014), and they perceived early mobility program as an occupational health hazard (Lee & Fan, 2012). Education

levels, duration of work experience, and participation in VAP and ICU in-service training significantly increase a nurse's knowledge of VAP guidelines (Korhan et al., 2014). There is a strong relationship between practice and knowledge related to EBP. Educational interventions are essential to improve successful implementation of evidence-based practice (Shafiei et al., 2014).

The above studies were done outside the United States. It is possible that the study sample and setting characteristics do not represent the critical care nurses and ICU culture in the United States; therefore, the results of the study may not be generalizable. The purposive sampling in the study by Soh and colleagues (2013) limits the generalizability of the results. Several authors failed to discuss the grounds for exclusion of participants in the study which increases the potential selection bias of the investigators. All studies were limited to the old VAP guidelines and the small sample sizes increases the risk of potential type II errors. In addition, the CUSP 4 MVP-VAP is a new approach in preventing VAEs. Research is warranted to assess knowledge, perceptions, and attitudes of critical care nurses of the CUSP 4 MVP-VAP in order to identify the barriers and factors that may influence the success of implementation of the new initiatives.

METHODS

Design

This DNP project used a quantitative, descriptive and correlational study to assess knowledge, perceptions, and attitudes of critical care nurses of the comprehensive unit-based safety program, for mechanically ventilated patients or the CUSP 4 MVP-VAP. Quantitative methods generate data that can be transformed into visible statistics, such as data in numeric

form, to examine either cause and effect relationship or the functional relationships between variables (Polit & Beck, 2012). Quantitative research is classified as non-experimental or experimental designs. A non-experimental design is used to describe, differentiate, or examine associations between or among variables, groups, or situations but does not involve manipulation of the independent variables; there is no random assignment or comparison groups (Polit & Beck, 2012). The most common non-experimental designs are descriptive and correlational. Descriptive study is used when little is known about a particular phenomenon, and it describes what actually exists (Sousa, Driessnack, & Mendes, 2007). Utilizing a quantitative descriptive study for this DNP project will assist in identifying potential barriers to implementation of the CUSP 4 MVP-VAP. The findings of this study will guide implementation of CUSP 4 MVP-VAP, tailored to a local ICU and provide useful information for designing an educational program for critical care nurses.

Ethical Considerations

Three basic principles guide any research involving human subjects: respect for persons, beneficence, and justice (Office for Human Research Protection, 2016).

Respect for Persons

Respect for persons requires that subjects participate in the survey voluntarily, free of coercion, duress, or undue influence and with adequate information (Office for Human Research Protection, 2016). Three elements were addressed to ensure informed consent: information, comprehension, and voluntariness. An introductory statement was provided to all potential participants prior to completion of survey. The information includes the topic of the study, expected time to complete the survey, purpose of survey, how results of the study will be used,

methods of data collection, and a confidentiality and anonymity statement. To ensure confidentiality and anonymity, the introductory statement also informed all participants of their absolute right to withdraw or not to complete the survey at any time without giving any reason or explanation. No identifiable information was obtained on the survey. The introductory statement was specific, precise, clear, and concise.

Beneficence

The principle of beneficence means “do no harm” and maximize possible benefits but minimize possible harms (Office for Human Research Protections, 2016). This DNP project does not meet the definition of research or human subject research by the University of Arizona; Therefore, this project does not pose any risk of harm to participants. Approval from St. Mary’s hospital was obtained prior to implementation of this project.

Justice

The principle of justice pertains to fair procedures and outcomes in the selection of subjects in the study (Office for Human Research Protections, 2016). To ensure fair selection of survey participants, all critical care nurses were invited to participate in the survey provided they have been employed by Carondelet St. Mary’s Hospital for at least 6 months.

Setting

Carondelet Health Network provides a wide array of services that include emergency care, neurological, cardiovascular, orthopedic, general surgery, and other medical care. The study was conducted at two facilities of Carondelet Health Network: the Carondelet Heart and Vascular Institute (CVHI) on St. Mary’s campus and the medical-surgical ICU at St. Mary’s hospital. The CVHI has 12 ICU beds while the medical-surgical ICU has 28 beds. Both intensive

care units are utilizing VAP prevention protocols based on the 2012 IHI ventilator bundle and practice physician-directed weaning of mechanical ventilation. A bundle incorporates the best available evidence-based practice to improve standard of care and patient outcome (AHRQ, 2017). The VAP bundle protocol includes elevation of the head of bed at 30-45 degrees, daily sedation vacation and assessment of readiness to extubate, peptic ulcer disease prophylaxis, deep venous thrombosis prophylaxis, and oral care with chlorhexidine.

Participants

Medical-surgical and cardiovascular ICU nurses at Carondelet St. Mary's Hospital in Tucson, AZ were invited to participate in the study. Only ICU nurses who were part-time and full-time employees at the time of survey and have worked for at least six months in the ICU at St. Mary's Hospital were included in the survey. Float and travel nurses were excluded from the study.

Data Collection

The survey was developed to assess a critical care nurse's knowledge, attitudes and perceptions in accordance with the CUSP 4 MVP-VAP. Close-ended questions were used because critical care nurses may find the survey easier to answer and less time consuming in interpreting and analyzing the responses (University of Wisconsin-Madison, 2010). The survey development used the guidelines created by the Office of Quality Improvement at the University of Wisconsin and was guided by the DNP project committee chair. A paper survey was utilized to increase response rate and to allow participants to complete the survey at their leisure. The survey was divided into three parts (see Appendix B). The first part of the survey was about the demographic data of the participants: age, gender, level of education, years of experience as a

nurse, years of experience as a critical care nurse, years of experience in the ICU at St. Mary's hospital and current position. The second part consists of 10 questions to assess the critical care nurse's knowledge of the new guidelines for VAE prevention in the CUSP 4 MVP-VAP. The third part assessed the perceptions and attitudes of critical care nurses of the new initiatives.

The survey was reviewed by at least 2 critical care nurses outside the survey pool to establish the face and content validity. The list of eligible nurses was obtained from the ICU manager, and emails were sent to nurses to set-up days and time to complete the paper survey. The paper survey was distributed to all eligible critical care nurses and participants completed the survey at their own time. A locked steel box was provided in employee break room where participants returned the completed survey on their own.

Data Analysis

The results of the survey were entered into SPSS software. Participants were assigned an identifying code according to the unit and shift worked. The following codes were used: M for medical ICU day shift, MN for medical ICU night shift, C for CVICU day shift, and CN for CVICU night shift. Descriptive and correlational statistics were used for data analysis. Frequency distribution and percentage were used to describe the characteristics of population sample and perceptions and attitudes of nurses of the CUSP 4 MVP-VAP. Minimum and maximum scores, total sum, mean, and standard deviation were used to describe the knowledge scores of nurses. Spearman correlation coefficient test was utilized to analyze the relationship between knowledge, perceptions, and attitudes of nurses to evidence-based interventions in the CUSP 4 MVP-VAP.

RESULTS

The survey was conducted to eligible ICU nurses at St. Mary's hospital from October 18 to October 25, 2017 ($n=71$). Of the 71 eligible ICU nurses, 70% completed the questionnaire ($n=50$). Data analysis was performed using SPSS. Descriptive and correlational statistics were applied. Frequencies and percentage were calculated for descriptive data analyses, while Spearman correlation coefficient was used to examine the relationship between the demographic profile of the participants, knowledge of the CUSP 4 MVP-VAP, and perceptions and attitudes of nurses toward evidence-based interventions. The demographic characteristics of the participants are presented in table 1 as frequencies and percentages. The participant's knowledge about the evidence based practice confined in the CUSP 4 MVP-VAP are reported in table 2 as frequencies and table 3 as sum, mean, and standard deviation. The perceptions and attitudes of nurses of the CUSP 4 MVP-VAP are presented in table 4 as frequencies and percentages.

Description of the Participants

Based on the study, most of the ICU nurses are between 40-49 years old (30%), followed by 30-39 years old (28%), and 50-59 years old (24%). Six percent of the participants are 60 years and older, while 6% are between 21-29 years old. Majority of the participants are female (80%), held a bachelor's degree (54%) as their highest nursing degree, full-time employee (92%), staff RN in their current position (90%), experienced (46%) and expert RN (48%) in their clinical competence. Although 40% of the participants have been a nurse for more than 16 years, 30% have 10-15 years of ICU experience and 28% account for participants with more than 16 years of ICU experience. Thirty percent of participants have been employed as an ICU nurse at St.

Mary's between 1-3 years, 20% have worked between 4-6 years, and another 20% between 10-15 years.

Knowledge Assessment

The second part of the questionnaire is the knowledge assessment listing 10 evidence-based interventions in preventing VAE's. The ICU nurses were most frequently correct regarding use of subglottic secretion drainage ET tube for patients expected to be intubated for more than 72 hours (94%) and criteria for discontinuing spontaneous breathing trials (82%). However, nurses received low scores for the remaining 8 questions. As shown in Table 2, the ICU nurses had the least knowledge regarding selective use of peptic ulcer disease prophylaxis for intubated patients (4%). Only 10% of nurses reported incorporating early mobility into the daily care of patient prior to extubation. The recommended frequencies of ventilator circuit changes (22%) and tracheal tube suctioning (34%) were known by minority of nurses. Forty eight percent of nurses were aware of the recommended frequencies of changing the heat-moisture exchanger (HME). The recommended tidal volume for ventilated patients with and without ARDS were known to 48% of participants. Fifty percent of nurses minimize sedation level by keeping Richmond Agitation-Sedation Scale (RASS) -1 to +1 and only 46% of participants were aware that RASS is not the appropriate tool for evaluation of ICU delirium. The knowledge scores of nurses ranged between 1 to 7 with a total mean score of 4.38 (SD 1.276). Although not significant, cardiovascular ICU nurses had better knowledge scores than medical ICU nurses (5.0 ± 0.81650 versus 4.3182 ± 1.12911). Also, cardiovascular ICU nurses had higher positive perception and attitude of evidence-based practice than medical ICU nurses (12 ± 3.10913 versus 11.45 ± 2.55) with medical ICU night shift with the lowest positive

perception score (10.20 ± 2.11). Based on the computed Spearman correlation coefficient, there was no significant correlation between knowledge scores of nurses and level of education (p -value .666), current clinical competence (p -value .243), current position (p -value .283), number of years as a nurse (p -value .283), number of years as ICU nurse (p -value .357), and number of years of service at St. Mary's hospital (p -value .588) at α -level of 0.05. However, knowledge scores of medical ICU night shift nurses were highly correlated with the total number of years of RN experience at the 0.05 α -level (p -value .045).

Perceptions and Attitudes of Nurses of the CUSP 4 MVP-VAP

A set of six statements were used to assess the perceptions and attitudes of nurses of the CUSP 4 MVP-VAP. Each item is scored on a scale of 1-4, with the higher score being associated with a more positive perception and attitude towards interventions in preventing VAEs. Based on the study, most of the ICU nurses (74%) agreed that spontaneous awakening trial (SAT) and spontaneous breathing trial (SBT) should be performed daily in all ventilated patients. Also, 86% judged the RASS useful and effective in assessing and titrating sedation to keep the target sedation level. However, only 38% found the confusion assessment method for the ICU (CAM-ICU) useful in assessing delirium in critically ill patients and 42% reported that they are not aware of this assessment tool. Majority of the participants (74%) agreed that the ABCDE bundle can potentially improve outcomes for ventilated patients. With regard to the early mobility (EM) program, only 46% of nurses agreed that it can be safely initiated on the first day of ICU admission and even during mechanical ventilation. In addition, 36% perceived the EM program as an occupational hazard and 42% were undecided if it posed a risk of occupational hazard or not. Based on the computed Spearman correlation coefficient, there was no significant

correlation between perceptions and attitudes of nurses of the CUSP 4 MVP-VAP and participant's demographic characteristics at α -level of 0.05. In addition, the study found no correlation between knowledge of the CUSP 4 MVP-VAP and perceptions and attitudes of ICU nurses of the evidence-based interventions confined in the CUSP 4 MVP-VAP at the 0.05 α -level (p -value .474). However, there was a significant correlation between the number of years of ICU experience and number of years of service at St. Mary's hospital and perceptions and attitudes of medical ICU day shift nurses at α -level of 0.05 (p -value .023 and p -value 0.10 respectively). Also, the level of education among cardiovascular ICU day shift nurses was found to be correlated with perceptions and attitudes of nurses on evidence-based interventions at α -level of 0.01 (p -value .006).

SUMMARY

Majority of the ICU nurses are female, held a bachelor's degree, full-time employee, staff RN in their current position, experienced and expert RN in their clinical competence, and between 40 to 59 years of age. The knowledge scores of ICU nurses were between 10 to 70% with no significant correlation with participant's demographic characteristics at α -level of 0.05. The ICU nurses has the least knowledge about selective PUD prophylaxis, followed by incorporating early mobility program for intubated patients, recommended frequencies of ventilator circuit changes, tracheal suctioning, and changing the HME. Although 50% of nurses use RASS to keep target sedation level of -1 to +1, only 46% of participants were aware that RASS is not the appropriate tool for assessment of delirium in intubated patients. In addition, only 48% of nurses were aware of the recommended low tidal volume ventilation for ARDS and

non-ARDS. The study found no correlation between knowledge of nurses of the CUSP 4 MVP-VAP and perceptions and attitudes of nurses of the evidence-based practice (p -value .474).

STUDY STRENGTHS

The purpose of the study is to assess the knowledge, perceptions, and attitudes of ICU nurses of the evidence-based practice contained in the CUSP 4 MVP-VAP in preventing ventilator-associated events. The descriptive and correlational research design of the study accomplished the goal. All factors, such as level of education, clinical competence, current RN position, duration of RN experience, duration of ICU experience, and number of years of service at St. Mary's hospital, were taken into consideration in the study. Participants of the study were properly selected based on the inclusion and exclusion criteria identified; Thereby, reducing the potential bias of the investigator.

STUDY LIMITATIONS

Although, the study achieved its goal, the study was limited due to time constraints. Also, there were three participants who did not respond to one knowledge question. The missing values for the knowledge variable was scored "not correct" and may have affected the actual knowledge scores of the participants.

RECOMMENDATIONS FOR PRACTICE

Based on the study, the cardiovascular ICU and medical ICU at St. Mary's hospital require substantial need for educational improvement and cultural change. The unit should develop their own CUSP team that will assist in creating a unit-based policies and procedures aligned to current evidence-based practice in preventing ventilator-associated events.

APPENDIX A:
EVALUATION TABLE

Appendix A.

Evaluation Table

Table 1.

Reference	Research Questions/ Purpose of the Study	Study Design	Sample & Setting	Methods/Measures	Results	Challenges to Scientific Rigor
Pinto, F., & Biancofiore, G. (2016)	To assess nurses' knowledge, utility, and perception of the ABCDE bundle	Close-ended questionnaire; Quantitative descriptive	<p><u>Sample</u> n=108 Female n=68 (63%) Male n=40 (37%)</p> <p><u>Setting:</u> Intensive Care Unit</p> <p><u>Sample Characteristics:</u> Mean age: 34.9 Mean duration of ICU service: 5.7 years</p>	<p><u>Methods:</u> Anonymous questionnaire w/ closed-ended questions</p> <p><u>Measures:</u> Knowledge of bundle</p> <p>Perceptions of ABCDE bundle</p>	<p>Knowledge of bundle: 41.6% (n=45)</p> <p>Perceptions: - 67% agreed w/ utility of bundle - 71% judged SAT & SBT easy to understand - 80% found RAAS & CAM useful; 48% do not utilized tool - 51% not aware or had use exercise/mobility safety screen - 53 do not perform multidisciplinary rounds - 34% believe ABCDE bundle applicable in their ICU</p>	<p><u>Threats to external validity:</u></p> <p>Sample Characteristics: - limited to Italian nurses - limited to nurses with >5 years of experience</p> <p>Setting characteristics: limited to intensive care units in Italy.</p>

Table 2.

Reference	Research Question/ Purpose of the Study	Study Design	Sample & Setting	Methods/ Measures	Results	Challenges to Scientific Rigor
Korhan, K.E., Yont, G.K., Kilic, S.P., & Uzelli, D. (2014)	To evaluate the knowledge of nurses about evidence- based measures in preventing VAP.	Cross- sectional, quantitative study	<p><u>Sample:</u> N=138 nurses (all female)</p> <p><u>Setting:</u> General intensive care units</p> <p><u>Sample Characteristics:</u> Mean age 27.3 Duration of nursing experience: 1-5 yrs: 55.8% >10 yrs: 8% Duration of ICU experience: 1-5 yrs: 58% > 10 yrs: 2.2% Had in-service ICU training program: 94.2% Had in-service training program for VAP: 23.4%</p>	<p><u>Methods:</u> Multiple-choice questionnaire</p> <p><u>Measures:</u> Knowledge of VAP guidelines</p>	<ul style="list-style-type: none"> - 79% aware that oral intubation is recommended to reduce VAP risk. - 62.3% states ventilator circuit shld be changed with each patient - 39.1% humidifier w/ both heat & humidity exchangers - 17.4% humidifier be changed q 48hrs - 68.8% use closed aspiration system - 29.2% thought ET w/ subglottic secretion drainage beneficial. - difference between education, duration of work experience, qualifications in ICU, participation in ICU and VAP training, & total median scores on questionnaire statistically significant ($p<0.05$). 	<p><u>Threats to external validity:</u></p> <ul style="list-style-type: none"> - Limited to old VAP prevention guidelines - small sample size, risk of Type II error - Limited to nurses in Western Turkey.

Table 3.

Reference	Research Questions/ Purpose	Study Design	Sample & Setting	Methods/Measures	Results	Challenges to Scientific Rigor
Jolley, S.E., Regan-Baggs, J., Dickson, R.P., & Hough, C.L. (2014).	To assess clinician knowledge regarding early mobility and identify barriers to provision.	Cross- sectional survey; quantitative study	<u>Sample:</u> $n=120$ (91 MDs, 17 RNs, 12 PTs) <u>Setting:</u> MICU <u>Sample Characteristics:</u> 71% RNs >5yrs of experience	<u>Methods:</u> Cross-sectional survey <u>Measures:</u> - Knowledge of potential benefits of early mobilization (EM) in maintaining muscle strength - Attitudes towards EM	-76% RNs disagree w/ ROM's benefit -59% RNs agree EM reduces mechanical ventilator (MV) days -No significant difference in yrs of experience (≥ 5 yrs: $p=0.67$; ≤ 5 yrs: $p=0.69$) -18% risks of EM>benefits -71% EM increases MSK injuries -65%RN's EM increases work stress. -47% RNs EM prolonged work days & delay work	<u>Internal validity:</u> -Selection bias -response bias (potential interaction between respondents) <u>External validity</u> -small sample size (low response rate by nurses): limit generalizability

Table 4.

Reference	Research Question/ Purpose	Study Design	Sample & Setting	Methods & Measures	Results	Challenges to Scientific Rigor
Jordan et al., 2014	To explore knowledge, attitudes, and oral care practice of ICU nurses and influencing factors.	Cross-sectional; quantitative	<p><u>Sample:</u> Convenient $n=241$ female=86.8%</p> <p><u>Setting:</u> ICU in Croatia</p> <p><u>Sample Characteristics:</u> Median age: 33 Mean yrs nursing experience: 14.6 ± 9.8 Mean yrs ICU experience 11.3 ± 8.8</p>	<p><u>Methods:</u> Questionnaire</p> <p><u>Measures:</u> Knowledge score of VAP bundle</p> <p>Attitudes towards oral care</p>	<p>Overall knowledge score 65.7%</p> <p>Attitudes -58.1% lack of time -48.5% lack of staff - 44.4% lack of supplies & equipment</p>	<p><u>External validity:</u> -Limited to oral care - Limited to nurses in Croatia</p>

Table 5.

Reference	Research Questions/ Purpose of the Study	Study Design	Sample & Setting	Methods & Measures	Results	Challenges to Scientific Rigor
Lin, H.L., Lai, C.C., & Yang, L.Y. (2014)	To assess the ICU nurses' knowledge of interventions for VAP prevention.	Descriptive, Quantitative study	<p><u>Sample:</u> N=133 (response rate 88.6%)</p> <p><u>Setting:</u> ICU & sub- acute respiratory care in Taiwan</p> <p><u>Sample Characteristics:</u> Age range 20-35 y/o Women 92% Men 8% Mean yrs. ICU experience 4.1 Team leaders 23 (17.3%) Senior RNs 29 (21.8%)</p>	<p><u>Methods:</u> 12 multiple choice questionnaire</p> <p><u>Measures:</u> VAP knowledge: VAP pathogenesis, route recommended, weaning process, position, sedation & analgesics, & oral care</p>	<p>Mean score 7.87±1.36 (65.6%) ICU license ($p=0.03$) & ranking of RN ($p=0.041$) significantly assoc. w/ high scores</p> <p>Highest ratio of correct answer: position (97.7%), weaning process (95.6%), sedative & analgesic agents (94.7%)</p> <p>Lowest ratio of correct response: use of ET w/ subglottic suction (6%), VAP pathogenesis (23.3%), Pathogen- causing VAP (45.1%)</p>	<p><u>Internal validity:</u> - selection bias - respondents were 92% women and younger nurses.</p> <p><u>External validity:</u> - Limited to nurses in Taiwan - small sample size - limited to younger nurses (20-35 y/o)</p>

Table 6.

Reference	Research Question/ Purpose of the Study	Study Design	Sample & Setting	Methods & Measures	Results	Challenges to Scientific Rigor
Al-Sayaghi, K.M. (2014).	<p>To evaluate the nurses' knowledge on evidence-based practice in preventing VAP.</p> <p>To determine associations between nurses' characteristics, workplace, and knowledge scores.</p>	Cross-sectional descriptive quantitative study	<p><u>Sample:</u> <i>n</i>=387 nurses</p> <p><u>Setting:</u> ICUs in Yemen</p>	<p><u>Methods:</u> Self-administered multiple-choice questionnaire</p> <p><u>Measures:</u> Knowledge score of VAP guidelines</p>	<p>Knowledge mean total score 47.3%</p> <p>Items w/ highest score (>60%): oral care, position, preventing unplanned extubation, OD sedation vacation, assessment of readiness to extubate, use of ET tube w/ subglottic secretion drainage</p> <p>Items w/ lowest score (<24%): care of ventilator circuit, use of kinetic bed, oral route for intubation.</p>	<p><u>External Validity:</u> - Limited to nurses in Yemen - small sample size</p>

Table 7.

Reference	Research Questions/ Purpose of the Study	Study Design	Sample & Setting	Methods & Measures	Results	Challenges to Scientific Rigor
Perez-Granda et al., 2013	To assess knowledge and adherence to VAP prevention guidelines among physicians, nurses, and students in the ICU.	Quantitative study	<u>Sample:</u> <i>n</i> = 167 (Physicians 32, nurses 108, students 27) <u>Setting:</u> ICU	<u>Methods:</u> 20-point questionnaire <u>Measures:</u> Knowledge of VAP	Hand hygiene significantly better in nurses ($p<0.01$). Median IQR knowledge score: Physicians 6 (5-7), Nurses 5(4-6), students 5 (4-7); $p=0.004$ Median practice score: physicians 5(4-6), nurses 4(3-5); $p=0.01$ Significant better knowledge scores w/ >1yr experience for all respondents ($p=0.004$).	<u>External validity:</u> - Small sample size - performed in a one single tertiary hospital

Table 8.

Reference	Research Questions/ Purpose of the Study	Study Design	Sample & Setting	Methods & Measures	Results	Challenges to Scientific Rigor
Shafiei et al., 2014	Measure the practice, attitude, and knowledge of evidence-based practice of ICU nurses.	Cross-sectional, descriptive, quantitative study	<p><u>Sample:</u> $n=195$</p> <p><u>Setting:</u> Iran</p> <p><u>Sample Characteristics:</u> Age range: 20-29 y/o (47.2%) 30-39 y/o (36.4%) 40-49 y/o (14.4%) >50 y/o (2%) Female (74.9%)</p>	<p><u>Methods:</u> Questionnaire</p> <p><u>Measures:</u> Practice, attitude, & Knowledge of EBP.</p>	<p>Mean score of EBP 4.48 ± 1.26</p> <p>Mean score of subscales: practice 4.58 ± 1.24, attitude 4.57 ± 1.35, knowledge/skill in EBP 4.39 ± 1.2</p> <p>Significant relationship between knowledge & practice subscale ($r=0.73$, $p<0.01$).</p> <p>Significant relationship between knowledge & attitude ($r=0.443$, $p<0.001$)</p> <p>No significant relationship between practice & attitude</p>	<p><u>External validity:</u> - Limited to nurses in Iran - small sample size</p>

Table 9.

Reference	Research Questions/ Purpose of the Study	Study Design	Sample & Setting	Methods for Data Collection and Data Analysis	Findings	Challenges to Trustworthiness
Soh, K.L., Davidson, P.M., Leslie, G., DiGiacomo, M., & Soh, K.G. (2013).	To describe nurses' perceptions of evidence-based interventions to prevent VAP.	Descriptive qualitative focus group study	<u>Sample:</u> $n=34$ nurses purposive sampling <u>Setting:</u> ICU in Malaysia <u>Sample characteristics:</u> Mean age 31.6y/o Mean length of ICU experience 3.7 yrs 3-yr diploma programme:24 Post basic critical care 9 Bachelor degree 1	<u>Data Collection:</u> -Group discussion after focus groups -Field notes compiled each focus group <u>Data Analysis:</u> Thematic analysis	Main themes/subthemes: - Knowledge impacts on change process (knowledge gap, prioritize care over assessment, rigid adherence to routine) -Initial resistance, ambivalence and movement to acceptance (initial resistance, gradual acceptance of change, mastering change) - Hierarchical organizational structure prevents change process (passive role, resistance or support of peers).	<u>External validity:</u> - purposive sampling limits generalizability - limited expression of participant's views due to fear of retaliation (hierarchical workplace)

APPENDIX B:
DISCLAIMER

KNOWLEDGE, PERCEPTIONS, AND ATTITUDES OF CRITICAL CARE NURSES
TOWARDS THE COMPREHENSIVE UNIT-BASED SAFETY PROGRAM FOR
MECHANICALLY VENTILATED PATIENTS IN PREVENTING VENTILATOR-
ASSOCIATED EVENTS

My name is Jeremiah Ramirez-Damilig and I am a graduate student completing my DNP project for Doctor of Nursing Practice degree at the University of Arizona. The purpose of this study is to assess the knowledge of critical care nurses of the evidence based interventions contained in the comprehensive unit based safety program for mechanically ventilated patients for preventing ventilator-associated events (CUSP 4 MVP-VAP).

If you choose to participate in this study, you will be asked to complete a paper survey that consists of three parts: demographic data of participants, assessment of critical care nurse's knowledge of the CUSP 4 MVP-VAP, and assessment of perceptions and attitudes of nurses. There are no direct risks or benefits to participants in this study. Your identity will be kept confidential and will not be disclosed in any paper, publication, or presentation. No identifiable information will be obtained on the survey. Every precaution will be taken to maintain confidentiality. Participation in the study is completely voluntary. You have the absolute right to withdraw or not to complete the survey at any time without giving any reason or explanation.

The Institutional Review Board at the University of Arizona responsible for human subject research at the University of Arizona reviewed this project and approved it in accordance with applicable state and federal regulations as well as University policies that protect the rights of participants in the study. For questions, concerns, or complaints about the study, you may contact the Principal Investigator at 520-626-6721 or by email at vpr-irb@email.arizona.edu.

By agreeing to participate in this survey, you agree to have your responses used for the purpose of this study.

APPENDIX C:
NOT HUMAN SUBJECTS RESEARCH DETERMINATION FORM



Research
Office for Research & Discovery

Human Subjects
Protection Program

1618 E. Helen St.
P.O.Box 245137
Tucson, AZ 85724-5137
Tel: (520) 626-6721
<http://rgw.arizona.edu/compliance/home>

Date:	October 18, 2017
Principal Investigator:	Jeremiah Opiniano Ramirez-Damilig
Protocol Number:	1710926959
Protocol Title:	Knowledge, perceptions, and attitudes of critical care nurses towards the comprehensive unit-based safety program for mechanically ventilated patients in preventing ventilator-associated events (CUSP 4 MVP-VAP)
Determination:	Human Subjects Review not Required

The project listed above does not require oversight by the University of Arizona because the project does not meet the definition of 'research' and/or 'human subject'.

- **Not Research as defined by 45 CFR 46.102(d):** As presented, the activities described above do not meet the definition of research as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "research means a systematic investigation, including research development, testing and evaluation, designed to contribute to generalizable knowledge".
- **Not Human Subjects Research as defined by 45 CFR 46.102(f):** As presented, the activities described above do not meet the definition of research involving human subjects as cited in the regulations issued by the U.S. Department of Health and Human Services which state that "human subject means a living individual about whom an investigator (whether professional or student) conducting research obtains data through intervention *or* interaction with the individual, or identifiable private information".

Note: Modifications to projects not requiring human subjects review that change the nature of the project should be submitted to the Human Subjects Protection Program (HSPP) for a new determination (e.g. addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the research question). Please contact the HSPP to consult on whether the proposed changes need further review.

The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).

APPENDIX D:
SITE APPROVAL LETTER



Carondelet St. Mary's. **Be well.**

October 5, 2017

Jeremiah Ramirez-Damilig, BSN
The University of Arizona
College of Nursing
1305 N. Martin Avenue, Room 311
P.O. Box 210203
Tucson, AZ 85721-0203

Re: DNP Project "Knowledge, Perceptions, and Attitudes of Critical Care Nurses Towards the Comprehensive Unit-Based Safety Program for Mechanically Ventilated Patients in Preventing Ventilator-Associated Events"

Dear Ms. Ramirez-Damilig,

On behalf of Carondelet St. Mary's Hospital, I am writing to grant you permission to conduct your quality improvement project in Medical-Surgical ICU and Cardiovascular ICU at St. Mary's Hospital. We will assist you in the important work that you are doing for improving the care provided to critically ill patients. You can contact me at 520-872-245 or email me at jbiggs@carondelet.org.

Sincerely,

A handwritten signature in black ink, appearing to read "Jennifer Biggs", is written over the typed name.

Jennifer Biggs, RN, MS
Chief Nursing Officer

APPENDIX E:
SURVEY

Part I: Demographics

All identifying information will be used only for the purposes of the study.

1. Which category below includes your age?

Less than 20 years old

21-29 years old

30-39 years old

40-49 years old

50-59 years old

60 years or older

2. What is your gender?

Female

Male

3. What is the highest level of education you have completed?

Associate degree

Bachelor's degree

Master's degree

Doctorate degree

Others:

4. What is your employment status?

Full time (40 or more hours per week)

Part-time (Less than 40 hours per week)

5. What do you think is your current clinical competence?

_____ Novice RN

_____ Experienced RN

_____ Expert RN

6. What is your current position?

_____ Staff RN

_____ Clinical Nurse Lead

_____ Manager

_____ Supervisor

7. How long have you been a nurse?

_____ < 1 year

_____ 7-9 years

_____ 1-3 years

_____ 10-15 years

_____ 4-6 years

_____ > 16 years

8. How long have you been an ICU nurse?

_____ < 1 year

_____ 7-9 years

_____ 1-3 years

_____ 10-15 years

_____ 4-6 years

_____ > 16 years

9. How long have you been at St. Mary's ICU?

_____ < 1 year

_____ 7-9 years

_____ 1-3 years

_____ 10-15 years

_____ 4-6 years

_____ > 16 years

Part II: Assessing Knowledge of the CUSP 4 MVP-VAP

Questions 1-10 are to assess your current knowledge of the new initiatives in preventing ventilator-associated events (VAEs). All information gathered from the survey will remain confidential.

1. Use of subglottic secretion drainage endotracheal tube is recommended for patients expected to be intubated for more than 72 hours.

_____ True _____ False

2. Peptic ulcer disease prophylaxis is recommended for all intubated patients.

_____ True _____ False

3. Ventilator circuits should be changed routinely for infection control purposes.

_____ True _____ False

4. Change heat-moisture exchanger (HME) every 5-7 days and as clinically indicated but not more frequently than every 48 hours.

_____ True _____ False

5. Incorporate early mobility into the daily care of patient once extubated.

_____ True _____ False

6. A tidal volume of 4-6ml/kg water (H₂O) is recommended for patients without ARDS and 6-8ml/kg (H₂O) for patients with ARDS.

_____ True _____ False

7. Tracheal tube suctioning should be carried out on a routine basis.

_____ True _____ False.

8. Minimize sedation level by keeping the patient's Richmond Agitation-Sedation Scale (RAAS) between -1 to +1.

True False

9. Evaluate patients daily for delirium using Richmond Agitation-Sedation Scale (RAAS).

True False

10. Spontaneous breathing trials should be continued until one of the following condition occurs: agitation, RR <8 or >33, or O2 saturation <88%.

True False

Part III: Assess Perceptions and Attitudes of Nurses of the CUSP 4 MVP-VAP

The following questions will assess your perceptions about interventions to prevent ventilator-associated events. It is not intended to measure your knowledge but rather seeks your views or feelings with regard to the new recommendations in preventing VAEs.

1. Spontaneous awakening trial (SAT) and spontaneous breathing trial (SBT) should be performed daily in all ventilated patients.

Agree Disagree Maybe I don't know

2. The Richmond Agitation-Sedation Scale (RASS) is useful and effective in assessing and titrating sedation to keep the target sedation level.

Agree Disagree Maybe I don't know

3. The Confusion Assessment Method for the ICU (CAM-ICU) is useful in assessing delirium in critically ill patients.

Agree Disagree Maybe I don't know

4. Implementation of the ABCDE (Awakening and Breathing Coordination, Delirium management, and Early mobility) bundle in the ICU will improve outcomes for ventilated patients.

_____ Agree _____ Disagree _____ Maybe _____ I don't know

5. Early mobilization program can be safely initiated on the first day of ICU admission and even during mechanical ventilation.

_____ Agree _____ Disagree _____ Maybe _____ I don't know

6. Early mobilization may pose a risk of occupational hazard, such as musculoskeletal injury.

_____ Agree _____ Disagree _____ Maybe _____ I don't know

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LIST OF TABLES

TABLE 1. *Demographic Characteristics of Participants (n=50).*

Characteristic	Frequency	Percent	Valid Percent	Cumulative Percent
Age				
21-29	3	6.0	6.0	6.0
30-39	14	28.0	28	34.0
40-49	15	30.0	30.0	64.0
50-59	12	24.0	24.0	88.0
60 and older	6	12.0	12.0	100.0
Total	50	100.0	100.0	100.0
Gender				
Male	10	20.0	20.0	20.0
Female	40	80.0	80.0	100.0
Total	50	100.0	100.0	100.0
Highest level of education				
Associate degree	14	28.0	28.0	28.0
Bachelor's degree	27	54.0	54.0	82.0
Master's degree	9	18.0	18.0	100.0
Total	50	100.0	100.0	
Employment Status				
Full time (36 hours or more)	46	92.0	92.0	92.0
Part time (less than 36 hours)	4	8.0	8.0	100.0
Total	50	100.0	100.0	
Clinical competence				
Novice RN	3	6.0	6.0	6.0
Experienced RN	23	46.0	46.0	52.0
Expert RN	24	48.0	48.0	100.0
Total	100	100.0	100.0	
Current position				
Staff RN	45	90.0	90.0	90.0
Clinical Nurse Lead	5	10.0	10.0	100.0
Total	50	100.0	100.0	

LIST OF TABLES - *Continued*TABLE 1. *Demographic Characteristics of Participants (continued).*

Characteristic	Frequency	Percent	Valid Percent	Cumulative Percent
Total # of years as a nurse				
<1 year	2	4.0	4.0	4.0
1-3 years	3	6.0	6.0	10.0
4-6 years	3	6.0	6.0	16.0
7-9 years	7	14.0	14.0	30.0
10-15 years	15	30.0	30.0	60.0
>16 years	20	40.0	40.0	100.0
Total	50	100.0	100.0	
Total # of years as ICU nurse				
<1 year	4	8.0	8.0	8.0
1-3 years	10	20.0	20.0	28.0
4-6 years	3	6.0	6.0	34.0
7-9 years	4	8.0	8.0	42.0
10-15 years	15	30.0	30.0	72.0
>16 years	14	28.0	28.0	100.0
Total	50	100.0	100.0	
Total # of years as ICU nurse at CSM				
<1 year	5	10.0	10.0	10.0
1-3 years	15	30.0	30.0	40.0
4-6 years	10	20.0	20.0	60.0
7-9 years	1	2.0	2.0	62.0
10-15 years	10	20.0	20.0	82.0
>16 years	9	18.0	18.0	100.0
Total	50	100.0	100.0	

LIST OF TABLES - *Continued*TABLE 2. *Knowledge of Critical Care Nurses of the CUSP 4 MVP-VAP*

Use of Subglottic Secretion Drainage ET Tube for Intubation >72 Hours

	Frequency	Percent	Valid Percent	Cumulative Percent
Not correct	3	6.0	6.0	6.0
Correct	47	94.0	94.0	100.0
Total	50	100.0	100.0	

PUD Prophylaxis Recommended for All Intubated Patients

	Frequency	Percent	Valid Percent	Cumulative Percent
Not correct	48	96.0	96.0	96.0
Correct	2	4.0	4.0	100.0
Total	50	100.0	100.0	

Ventilator Circuits Should be Changed Routinely for Infection Control Purposes

	Frequency	Percent	Valid Percent	Cumulative Percent
Not correct	39	78.0	78.0	78.0
Correct	11	22.0	22.0	100.0
Total	50	100.0	100.0	

Change HME Every 5-7 Days and as Clinically Indicated But Not More Than Every 48 Hours

	Frequency	Percent	Valid Percent	Cumulative Percent
Not correct	26	52.0	52.0	52.0
Correct	24	48.0	48.0	100.0
Total	50	100.0	100.0	

Incorporate Early Mobility into the Daily Care of Patient Once Extubated

	Frequency	Percent	Valid Percent	Cumulative Percent
Not correct	45	90.0	90.0	90.0
Correct	5	10.0	10.0	100.0
Total	50	100.0	100.0	

LIST OF TABLES – *Continued*TABLE 2. *Knowledge of Critical Care Nurses of the CUSP 4 MVP-VAP (continued).*

A Tidal Volume of 4-6ml/kg Water is Recommended for Patients Without ARDS and 6-8ml/kg (H₂O) for Patients with ARDS

	Frequency	Percent	Valid Percent	Cumulative Percent
Not correct	26	52.0	52.0	52.0
Correct	24	48.0	48.0	100.0
Total	50	100.0	100.0	

Tracheal Tube Suctioning Should Be Carried Out on a Routine Basis

	Frequency	Percent	Valid Percent	Cumulative Percent
Not correct	33	66.0	66.0	66.0
Correct	17	34.0	34.0	100.0
Total	50	100.0	100.0	

Minimize Sedation Level by Keeping the Patient's Richmond Agitation-Sedation Scale (RASS) Between -1 to +1.

	Frequency	Percent	Valid Percent	Cumulative Percent
Not correct	25	50.0	50.0	50.0
Correct	25	50.0	50.0	100.0
Total	50	100.0	100.0	

Evaluate Patients Daily for Delirium Using Richmond Agitation-Sedation Scale (RASS)

	Frequency	Percent	Valid Percent	Cumulative Percent
Not correct	27	54.0	54.0	54.0
Correct	23	46.0	46.0	100.0
Total	50	100.0	100.0	

Criteria for Discontinuation of Spontaneous Breathing

	Frequency	Percent	Valid Percent	Cumulative Percent
Not correct	9	18.0	18.0	18.0
Correct	41	82.0	82.0	100.0
Total	50	100.0	100.0	

LIST OF TABLES – *Continued*TABLE 3. *Descriptive Statistics for Knowledge Assessment of the CUSP 4 MVP-VAP*

	N	Sum	Mean	Std. Deviation
Use of subglottic secretion drainage ET tube for intubation >72 hours.	50	47	0.94	.240
PUD prophylaxis recommended for all intubated patients.	50	2	0.04	.198
Ventilatory circuits should be changed routinely for infection control purposes.	50	11	0.22	.418
Change HME every 5-7 days and PRN but not more frequently than 48 hours.	50	24	0.48	.505
Incorporate early mobility into the daily care of patient once extubated.	50	5	0.10	.303
A tidal volume of 4-6 ml/kg water is recommended for non-ARDS and 6-8 ml/kg for ARDS.	50	24	0.48	.505
Tracheal suctioning should be carried out on a routine basis.	50	17	0.34	.479
Minimize sedation level by keeping RASS -1 to +1.	50	25	0.5	.505
Evaluate patient daily for delirium using RASS.	50	23	0.46	.503
SBT should be continued until one of the following condition occurs: agitation, RR<8 or >30, or O2 sat <88%.	50	41	0.82	.388
Valid N	50			

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Total Knowledge Score	50	1.0	7.0	219.0	4.38	1.276
Valid N	50					

LIST OF TABLES – *Continued*TABLE 4. *Perceptions and Attitudes of Nurses of the CUSP 4 MVP-VAP*

SAT and SBT Should be Performed Daily in All Ventilated Patients.

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	37	74.0	74.0	74.0
Disagree	6	12.0	12.0	86.0
Maybe	6	12.0	12.0	98.0
I don't know	1	2	2	100.0
Total	50	100.0	100.0	

The RASS is Useful and Effective in Assessing and Titrating Sedation to Keep the Target Sedation Level.

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	43	86.0	86.0	86.0
Disagree	4	8.0	8.0	94.0
Maybe	3	6.0	6.0	100.0
I don't know	0	0	0	
Total	50	100.0	100.0	

The Confusion Assessment Method for the ICU (CAM-ICU) is Useful in Assessing Delirium in Critically Ill Patients.

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	19	38.0	38.0	38.0
Disagree	2	4.0	4.0	42.0
Maybe	8	16.0	16.0	58.0
I don't know	21	42.0	42.0	100.0
Total	50	100.0	100.0	

Implementation of the ABCDE bundle in the ICU will Improve Outcomes for Ventilated Patients

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	37	74.0	74.0	74.0
Disagree	0	0	0	74.0
Maybe	8	16.0	16.0	90.0
I don't know	5	10.0	10.0	100.0
Total	50			

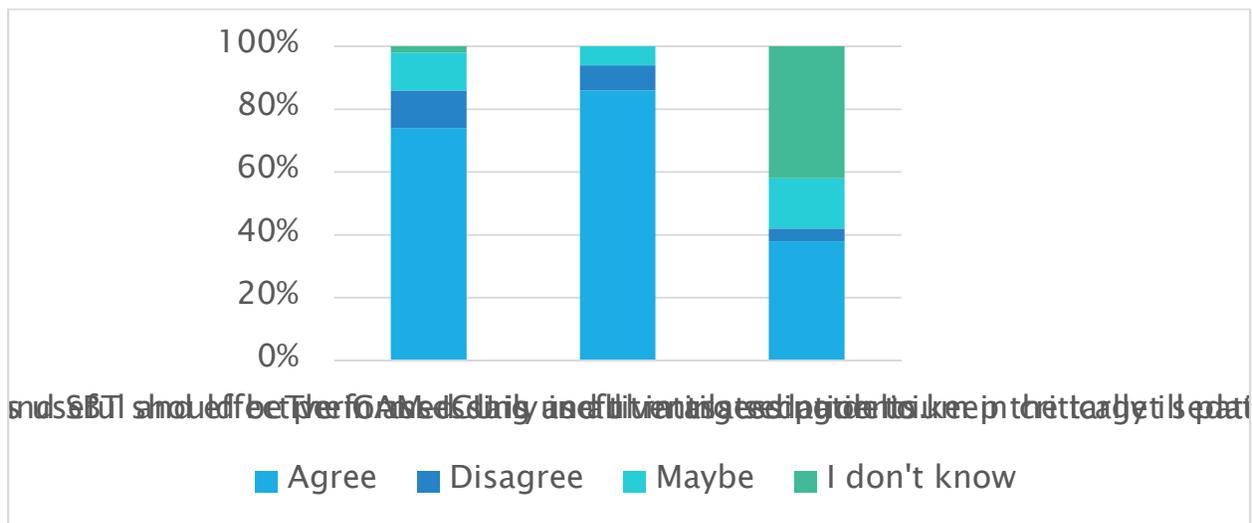
LIST OF TABLES – *Continued*TABLE 4. *Perceptions and Attitudes of Nurses of the CUSP 4 MVP-VAP (continued).*

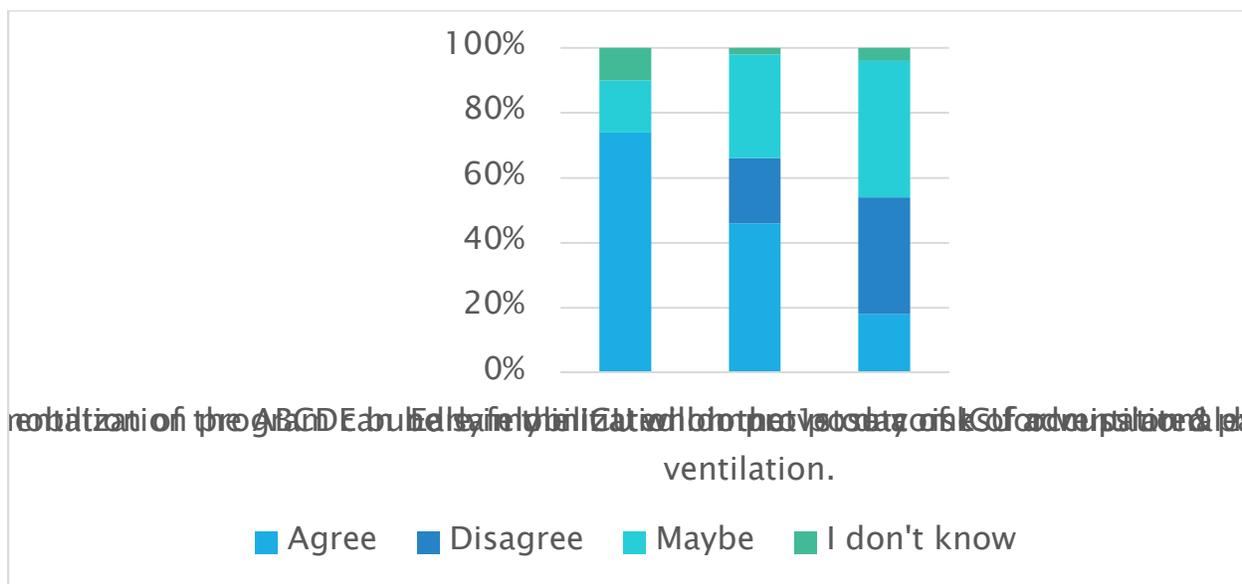
Early Mobilization Program can be Safely Initiated on the First Day of ICU admission and Even During Mechanical Ventilation

	Frequency	Percent	Valid Percent	Cumulative Percent
Agree	23	46.0	46.0	46.0
Disagree	10	20.0	20.0	66.0
Maybe	16	32.0	32.0	98.0
I don't know	1	2.0	2.0	100.0
Total	50	100	100.0	

Early Mobilization Do Not Pose a Risk of Occupational Hazard

	Frequency	Percent	Valid Percent	Cumulative Percent
Disagree	18	36.0	36.0	36.0
I don't know	2	4.0	4.0	40.0
Maybe	21	42.0	42.0	82.0
Agree	9	18.0	18.0	100.0
Total	50	100.0	100.0	

LIST OF TABLES – *Continued*TABLE 5. *Perceptions and Attitudes of Nurses of SAT, SBT, RASS, and CAM-ICU*

LIST OF TABLES – *Continued*TABLE 6. *Perceptions and Attitudes of Nurses of ABCDE Bundle and Early Mobilization Program*

LIST OF TABLES – *Continued*

TABLE 7. Spearman Correlation Coefficient of Knowledge Scores and Demographic Profile of Participants

		Total Knowledge Score	Highest Level of Education	Clinical Competence	Current Position	Total # of RN years	Total # of years as ICU RN	Years of Service as ICU RN at CSM
Total Knowledge Score	Correlation Coefficient	1.000	.062	0.168	.155	.155	.133	.078
	Sig. (2-tailed)	.	.666	0.243	.283	.283	.357	.588
	N	50	50	50	50	50	50	50

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

LIST OF TABLES – *Continued*

TABLE 8. Spearman Correlation Coefficient Between Perception and Attitude of Nurses and Demographic Profile

		Total Perception and Attitude Scores	Highest Level of Education	Clinical Competence	Current Position	Total # of RN years	Total # of years as ICU RN	Years of Service as ICU RN at CSM
Total Perception and Attitude Scores	Correlation Coefficient	1.000	-.042	.092	.019	.123	.155	.269
	Sig. (2-tailed)	.	.773	0.524	.898	.396	.282	.058
	N	50	50	50	50	50	50	50

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

LIST OF TABLES – *Continued*

TABLE 9. Spearman Correlation Coefficient Between Knowledge and Perception and Attitude of Nurses

		Total Knowledge Scores	Total Perception & Attitude Scores
Total Knowledge Scores	Correlation Coefficient	1.000	.104
	Sig. (2-tailed)	.	.474
	N	50	50
Total Perception & Attitude Scores	Correlation Coefficient	.104	1.000
	Sig. (2-tailed)	.474	.
	N	50	50

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

LIST OF TABLES – *Continued*

TABLE 10. Spearman Correlation Between Total Number of Years as ICU RN and Perceptions and Attitudes of Medical-ICU Day Shift Nurses of the CUSP 4 MVP-VAP

		Total # of years as ICU RN	Total # of years as ICU nurse at CSM
Perceptions & Attitudes	Correlation Coefficient	.482*	.535*
	Sig. (2-tailed)	.023	.010
	N	22	22
Total # of years as ICU RN	Correlation Coefficient	.482*	.535*
	Sig. (2-tailed)	.023	.010
	N	22	22

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

LIST OF TABLES – *Continued*

TABLE 11. Spearman Correlation Between Knowledge Scores of Medical ICU Night Shift Nurses and Total Number of Years as a Nurse

		Total # of years as a Nurse	Knowledge Scores
Total # of years as a Nurse	Correlation Coefficient	1.000	.525*
	Sig. (2-tailed)	.	.045
	N	15	15
Knowledge Scores	Correlation Coefficient	.525*	1.000
	Sig. (2-tailed)	.045	.
	N	15	15

*. Correlation is significant at the 0.05 level (2-tailed).

LIST OF TABLES – *Continued*

TABLE 12. Spearman Correlation Between Level of Education of Cardiovascular ICU Nurses and Perception and Attitudes of the CUSP 4 MVP-VAP

		Highest Level of Education	Perception & Attitude Scores
Highest Level of Education	Correlation Coefficient	1.000	.896**
	Sig. (2-tailed)	.	.006
	N	7	7
Perception & Attitude Scores	Correlation Coefficient	.896	1.000
	Sig. (2-tailed)	.006	.
	N	7	7

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).