

2018

# Systematic Review of Sedation Management in the Pediatric Critical Care Unit

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# Walden University

College of Health Sciences

This is to certify that the doctoral study by

Myrlene Madelon

has been found to be complete and satisfactory in all respects,  
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the review committee have been made.

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Walden University

2018

Abstract

Systematic Review of Sedation Management in the Pediatric Critical Care Unit

by

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MS, Dominican College, 2014

MS, Wilkes University, 2005

BS, Plattsburgh State University, 2004

Project Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Doctor of Nursing Practice

Walden University

February 2018

## Abstract

Nurse-driven guidelines existed for the management of sedation in adult population; however, there is a lack of guidelines for the critically ill children. Nurses play significant roles in the management of sedation for mechanically ventilated patients in the Pediatric Intensive Care Unit (PICU), nonetheless, comprehensive guidelines for the management of sedation does not exist. The purpose of this systematic literature review was to evaluate and synthesize evidence-based research that can be used to adapt a pediatric clinical guideline for sedation management. The ACE star model and the evidence-based practice model were used as a framework to guide this review. The practice question focused on investigating the available best practices that can be used to support the nursing management practice of sedated patients in the PICU. This is important because inadequate sedation management can lead to multiple adverse outcomes for patients. The design of this project was a systematic literature review method. The sources of the data were gathered from Medline, PubMed, CINAHL, Joanna Briggs institute and Google Scholar. This review included 17 studies, of which 84.2% showed improvement with positive patient outcomes such as decreased sedation use, decreased length of stay, and improved nursing practice. The results also support recommendations for evidence-based practice guidelines in the clinical nursing practice setting. In conclusion, despite the recommendation for the use of sedation guidelines, this systematic review found that there are few studies comprehensively evaluating the impact of nurse-driven sedation management in the PICU. The social implication of this review is that more studies involving pediatric patients utilizing nurse-driven sedation protocol is needed, before it can be adopted in the PICU.

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## Dedication

I dedicate this work to God, who has granted me the strength, faith, courage, and perseverance throughout to pursue this DNP journey. I also dedicate this work to my parents, especially my mother, who has always been there to support me. You are greatly appreciated for all your work.

## Acknowledgments

Thank you, God, for blessing, guiding and giving me strength throughout the program. First, I want to thank my family and friends for their contributions to this project. I also want to thank each of my project committee members Dr. Joanne Minnick, Dr. Corinne Wheeler and Dr. Lilo Fink for their professional guidance and support. Dr. Minnick, thank you, for providing moral support when I needed it desperately. You are an amazing mentor, and I truly appreciate your exceptional mentorship to me. I would like to especially thank Donna Johnson, my preceptor and mentor, for granting me the opportunity to shadow you in your leadership role to complete my practicum hours' requirement and guiding me effortlessly through the project. She has shown me, by example, what a good leader should be. I would also like to thank my advisor, Mr. Rodney Turner, for always being there to answer my questions. The success of my achievement would not have been possible without your contribution.

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## Section 1: Nature of the Project

### **Introduction**

Sedation management is a necessary element in the care of mechanically ventilated, critically ill children. The role of sedation titration is to ensure a patient's comfort; therefore, sedation is used in the pediatric critical care unit for various reasons, such as to reduce patient pain and anxiety, decrease agitation, facilitate mechanical ventilation, prevent the displacement of endotracheal tubes, and decrease cellular metabolism (Keogh, Long, & Horn, 2015). At the practicum site, the mechanically ventilated and sedated patient is currently managed by nurses and physicians in collaboration based on the physician's preference, which often leads to over or under sedation (Dreyfus, Javouhey, Denis, Touzet, & Bordet, 2017). It is not uncommon for a patient who was sedated on mechanical ventilation to be readmitted to the intensive care unit (ICU) due to poor sedation management after being discharged. The patient has an increased length of stay, complications of immobility, and an increase in hospital costs from diseases or infections caused by long-term sedation (Beck & Johnson, 2008; Verlaet et al., 2013). However, nurses, as well as other health care providers, are charged with the responsibilities of decreasing the length of stay, increasing positive patient outcomes, and minimizing patient and family dissatisfaction in association with care managed in the unit. Nurse-driven protocols in the adult population have been seen to not only improve patient outcomes but also increase nurse satisfaction (Fry, Edelman, & Cochran, 2009). Having an evidence-based nurse-driven guideline for sedation at the practicum site may

support critical care pediatric nurses to provide quality care to their patients while advocating for them in collaboration with the medical team.

The nature of this Doctoral Nursing Practice (DNP) project was to provide a systematic review of evidence-based research on nurse-driven sedation management guidelines that may support the nursing practice of sedation management in the pediatric critical care unit. The goal was to guide nurses in the decision-making process by using evidence-based articles on management of mechanically ventilated pediatric patients who will be in the pediatric intensive care unit (PICU). This DNP project can lead to social change in the nursing practice by proposing pediatric sedation management guidelines, including the review of articles that demonstrate their effectiveness, which can be used to influence the care of sedated patients to improve nursing practices with pediatric patients who are critically ill, improving patient comfort and promoting better outcomes.

### **Problem Statement**

#### **Local Nursing Practice Problem**

The current practice of sedation management at the practicum site is that sedation titration is based on the physician's orders to the nursing staff without the adoption of an evidence-based assessment guide to lead the collaboration between the nurses and physician practice. The titration and management of sedation is affected by many variables such as how much and how long sedation is given, experience level of nursing professional, nursing skills, and the patients' hemodynamic response (New York-Presbyterian Hospital, n.d). The current local nursing practice problem is that sedation management differs based on individual nurses caring for patients. The project site

currently has tools for nurses to address some important aspects of sedation management; however, comprehensive nursing guidelines do not exist. The nursing staff sometimes feel overwhelmed when evaluating whether the patient's pain is being managed effectively. The need to address this problem is evident at the clinical site in its negative impact on nursing satisfaction and patient outcomes after leaving the ICU. The purpose of this systematic review was to look at the current practice then utilize the findings to influence how patients are cared for when receiving sedation.

### **Local Relevance**

Sedation management practices vary among institutions, partly because of institutional bias as well as the fact that sedation requirements differ from patient to patient (Beck & Johnson, 2008). The absence of evidence-based nursing guidelines for assessing patients leads to ineffective management in the care of mechanically ventilated patients (Vet et al., 2013). Evidence has shown that without clear guidelines in place for the management of sedation in nursing practice, outcomes such as patients' length of stay and hospital costs can be affected (Roux et al., 2016). According to the director of critical care nursing at the project site, the number of sedation days for a mechanically ventilated patient in the pediatric critical care unit is greater than 5 days, while the length of stay is greater than 15 days (D. Johnson, personal communication, March 27, 2017). The patients at the site are being discharged from the critical care unit but are readmitted to the unit due to complications such as drug withdrawal (D. Johnson, personal communication, March 27, 2017). A lack of guidance may be contributing to the negative effect from the absence of an evidence-based guideline to adequately manage sedation.



A comprehensive management of sedation includes essential elements such as assessing for oversedation and undersedation, withdrawal symptoms, and delirium. Using published guidelines for adults on pediatric patients can pose safety concerns, as the efficacy in children is not known (Deeter et al., 2011). An evidence-based nurse-driven guideline can be used for clinical decision-making and collaboration instead of decisions that are based on opinions or hierarchy levels such as the physician's preference. For these reasons, the lack of evidence-based nurse-driven sedation management guidelines for the pediatric population is a relevant practical problem that needs to be addressed.

### **Significance of Nursing Practice**

This DNP project holds significance to the field of nursing practice, as it may motivate the local site to establish an evidence-based standard for the pediatric critical care nursing staff to manage sedation. The project also addresses the problem of the lack of evidence-based nurse-driven guidelines for the care of mechanically ventilated patients in the PICU. In the project site, this issue affects nursing satisfaction, the patients' length of stay, and hospital costs. This doctoral project is significant to nursing practice globally, as this project may help identify a universal assessment tool that can guide nursing practice, empower nurses to make decisions based on evidence, improve patient outcomes, and decrease unnecessary costs.

In my review of scholarly articles, I found several evidence-based articles on sedation management of the mechanically ventilated pediatric population. The published literature reviewed for this DNP project may help establish universal guidelines for pediatric sedation management at the local practicum site. An example of an institution

that attempts to address the nurse-driven pediatric sedation management problem is Seattle Children's Hospital. This institution has developed a nursing protocol for the management of pediatric sedation, which has led to decreasing the patients' length of stay in PICUs and improves the number of mechanical ventilation days (Deeter et al., 2011). The establishment of an evidence-based tool may allow nurses at the local site to make informed decisions and be better advocates for their patients and provide optimal patient management, decreasing readmissions to the PICU for sedation-related complications. This may lead to decreased lengths of stay and increased nursing satisfaction, as nurses may feel that their interventions are positively impacting patient care.

### **Purpose**

The purpose of this systematic literature review doctoral project was to examine evidence from the literature that can be used in the care and management of mechanically ventilated pediatric patients in the ICU. This project may contribute to the enhancement of better nursing outcomes and improving pediatric patients' outcomes receiving continuous sedation in the PICU.

### **Gap in Practice**

The purpose of this systematic literature review was to examine and summarize the benefits of evidence-based practice guidelines for nurses in the pediatric critical care nursing in the management of sedation and evaluate tools that are published and can improve the nursing practice of sedation management in the pediatric critical care unit. Evidence-based practice is the hallmark nurses use to provide care in the clinical area. It is concerning that the PICU does not have a sedation management approach that is

grounded in evidence-based data, despite the benefits of using evidence-based practices. An evidence-based protocol exists for the adult population; however, there is no evidence-based protocol available to use for the pediatric population. Because of the state of current practice, it is evident that a practice gap among pediatric ventilated patients exists. This DNP project may provide nurses with a tool to provide effective care to mechanically ventilated critically ill children receiving sedation. A nurse-driven guideline will support the provision of efficient care in the management of sedation.

### **Practice-focused Question**

The practice-focused question of this doctoral project was “What are the best practices available that can be used to support the nursing management practice of sedated patients in the pediatric intensive care unit?” The systematic literature review allowed me to evaluate whether adapting and implementing an evidence-based practice guideline will enhance the nursing practice in the pediatric critical care unit. The population included all nurses caring for pediatric patients receiving sedation age one month to 18 years. The intervention and outcome of this DNP project was to identify an evidence-based tool that can be implemented for the care and the outcomes and will enhance the nursing practice leading to improve patients’ length of stay and decrease the mechanical ventilation days in the PICU. The design of this systematic review was the synthesis of the literature review research for the systematic reviews, quantitative studies, qualitative studies, and pilot studies.

## **Addressing the Gap in Practice**

Currently, the nursing practice of managing sedation in the PICU is guided by clinical judgment and experience level. Due to a lack of evidence-based guidelines, sometimes patients are negatively affected by this practice (D. Johnson, personal communication, March 27, 2017). I addressed this gap by providing a summary of what has been done to address this problem in the literature, which may guide nursing practice, improve patient outcomes, decrease unnecessary costs, and empower nurses in making decisions rooted in evidence. Addressing this gap may encourage nurses to participate in evidence-based practice by outlining how nurse-driven protocols can positively impact patients and, ultimately, the health care system. Regarding critically ill mechanically ventilated adults, the benefits of a nurse-driven protocol have been demonstrated (Beck & Johnson, 2008). This systematic literature review may provide the same benefits to the critical pediatric population in other institutions through summarizing research on evidence-based nurse-driven protocol.

## **Nature of the Doctoral Project**

### **Source of Evidence**

Evidence-based practice has been shown to increase patient safety, improve clinical outcomes, reduce health care costs, and decrease variation in patient outcomes (Black, Balneaves, Garossino, Puyat, & Qian, 2015). The nature of this project was to collect evidence from current evidence-based practice guidelines in the literature to support the need for the implementation of an evidence-based practice for sedation management in the PICU. The sources included nursing textbooks and nursing journals,

including the *American Journal of Critical Care Nursing*, *American Journal of Nursing*, *American Association College of Nursing*, *Critical Care and Pain*, *Journal of Clinical Nursing*, and *International Journal of Nursing*. Peer-reviewed articles were also accessed from online databases such as CINAHL Google scholar, Walden Library, Medline, Cochrane, and PubMed. In addition, official websites such as the American Academy of Pediatrics, Society of Critical Care Medicine, and American Association of Critical-Care Nurses were accessed for additional resources.

### **Approach**

The organization and analysis of the DNP project was obtained from relevant sources using a synthesis matrix. A synthesis matrix provides an overview of the current research relevant to the selected topic. It is a tool that assists with the critical examination of multiple articles and resources, and this visual tool displays how the articles relate to one another and how each article relates to themes in the literature review (Clark & Buckley, 2017). The approach to organizing and synthesizing the evidence gathered included a matrix synthesis that groups the relevant concepts by categories related to sedation management. The information was synthesized and can be used to recommend the integration of an evidence-based guidelines for clinical practice. A matrix methodology was used to organize the information from the literature review (see Grove, Burns, Gray, & Burns, 2013). The sources were organized to reflect current knowledge on the focused question.

## **Significance**

### **Stakeholders**

In the PICU, most patients admitted to the unit require continuous sedation for the management of their underlined conditions (Roux et al., 2016). Nurses provide care to these patients on a regular basis, including the management of sedation. Sedation management in the pediatric population remains a challenge in health care due to a lack of clinical guidelines to guide the practice in this population. The result of this DNP project may affect multiple stakeholders by addressing the lack of a pediatric evidence-based nurse-driven practice guideline. The main stakeholders are the PICU nursing staff, patients, patient caregivers, nurse practitioners, physicians, pharmacists, and nursing directors. Additional stakeholders that may be affected include nursing educators, unit nursing council committees, institution practice boards, and nursing management. The patients and their caregivers, as one of the stakeholders, will also be affected, as their care experiences will improve as well as allow them the opportunity to collaborate with the team in their treatment plans. The nursing staff will be affected, as they may gain new practice knowledge in guiding patient care and the patient may be with less complications. This systematic literature review provided the local institution with the potential to improve patient outcomes and reduce critical care and hospital length of stay.

### **Contribution of the Doctoral Project**

This project contributes to nursing practice by enhancing knowledge and providing an effective tool for the management of sedation among the pediatric population. The outcome of this review may also improve overall patient safety and

outcomes, as it will reduce ICU and hospital length of stay. The American Association of Colleges Nursing (2006) state that the essentials of the doctoral of nursing practice are to design, implement, and evaluate therapeutic interventions based on nursing science (p. 16). This systematic literature review of nurse-driven sedation guidelines encompassed the DNP Essentials III and VIII and allowed me to analyze and implement evidence into practice. This doctoral project will provide recommendations and inspire nurses with patient ownership to collaborate with the medical team to reduce oversedation and undersedation practices. This DNP project also contributes to decreasing the costs associated with complications from inadequate sedation management by providing recommendations.

### **Transferability**

Evidence-based practice is the integration of available research evidence with clinical expertise and patient values (Prendergast, 2011); it has been increasingly emphasized within nursing as a method for knowledge transfer. The use of evidence-based practice has been shown as an effective approach for clinical decision-making in practice, because it offers a solution to improve health care quality and reduce health care costs. A pediatric evidence-based practices guideline may improve the care of pediatric patients in other PICUs with similar practice problems. The result of this systematic review can be shared with other critical units locally within the health care organization, as well as locally within the state with other PICUs. This DNP project can provide an evidence-based practice evaluation for knowledge transfer for nursing throughout all children's hospitals in the state of the project site.

### **Social Change Implication**

This DNP project can create positive social change within the project site by encouraging nurses to practice based on evidence, improving nursing satisfaction and patient outcomes. Adopting a nurse-driven guideline can enhance nursing morale, as this tool will empower nurses to collaborate with practical decision-making in sedation management in critical care. A systematic literature review can also improve the safety and outcomes at the local clinical practicum site. As the guidelines will improve patient outcomes at the site, the guideline can be potentially used globally in the care management of pediatric patients. Adoption of new evidence-based practices will facilitate change in the decision-making in the critical care unit. Nurse-driven protocol for sedation management has shown to improve nursing satisfaction, improve patients' safety, decrease required times in sedation, and decrease mechanical ventilation (Bugedo et al., 2013). Nurses will be able to monitor and measure the effects of interventions in the patients' care with guided evidence.

### **Summary**

Both oversedation and undersedation can lead to poor outcomes in patient care. Effective management of sedation is essential for improving poor sedation practices in the PICU. Because of the poor patient outcomes that can result from the ineffective management of sedation, the need for evidence-based guidelines is critical to not only facilitate the best results for patients but also to provide nurses with a tool they can use when making clinical decisions in the care of patients receiving sedation. The evidence found by Neunhoeffler et al. (2015) suggests that the utilization of a nurse-driven



guideline results in a significant reduction in time on mechanical ventilation, a significant decrease in the incidence of withdrawal symptoms, and a reduction in the length of stay in the ICU. With the summary of the evidence-based nurse-driven guidelines, intensive care nurses may possess a tool that may assist them in managing sedation based on the latest practice guidelines. They will no longer rely on their personal judgment when caring for patients receiving sedation. The systematic literature review can facilitate the use of evidence-based guidelines in clinical practice to improve patient safety.

The second section of this project will provide an overview of the concepts, models, and theories that guided the systematic review of the nurse-driven sedation guideline in the pediatric population. In Section 2, I will also provide the relevance of this problem to nursing practice, a local background, and the context prompting the review of this problem.

## Section 2: Background and Context

### **Introduction**

Nursing is refocusing its practices to be evidence-based practice, which will positively impact patients. According to McEwen and Wills (2014), evidence-based practice has been called the best and innovative approach to problem-solving in the care of patients. Sedation management is a complex process, as it can be affected by various factors. The practice problem at the practicum site was that the pediatric sedation management may vary based on the individual nurse caring for the patient. However, evidence has demonstrated significant improvement in the adult population using the standardized clinical guidelines to manage sedation in adults, which is lacking in pediatric patients (Beck & Johnson, 2008). The focused practice question for this doctoral project was “What are the best practices available that can be used to support the nursing management practice of sedated patients in the pediatric intensive care unit?” The intent of this project was to examine and summarize evidence-based practice guidelines that can be used to improve the nursing practice of sedation management in the pediatric critical care unit.

In this section, I describe the concepts, models, and theories used in the literature review of nurse-driven sedation management. This section also includes a synthesis of theorists’ works, such as the situation-specific theory, as it relates to the use of nurse-driven evidence-based guidelines for the management of sedation in the pediatric critical care population. This section also includes a discussion of the importance of this project for the nursing practice, the local background and the context of the problem in the

current practicum site, including the role of the student in the project, as well as clarification of some terms.

### **Concepts, Models, and Theories**

#### **Rationale for Concepts, Models, and Theories**

This DNP project was driven by the concept of evidence-based practice nursing. According to McEwen and Wills (2014), evidence-based practice was developed so that the health care professional should always seek to base his or her practice on the latest grounded research evidence and scientific development. Evidence-based practice relates to this project, as the nursing practice of sedation management at the practicum site does not use the latest grounded evidence. Another concept that assisted in the systematic review of evidence-based guidelines for pediatric sedation management is practice-based evidence. This concept considers that knowledge can be generated from practice as well as from research (McEwen & Wills, 2014). The practice-based evidence concept integrates both clinical experiences and research evidence when making a clinical decision on patient care management. The ACE star model was used to facilitate the systematic review of this nurse-driven sedation management DNP project.

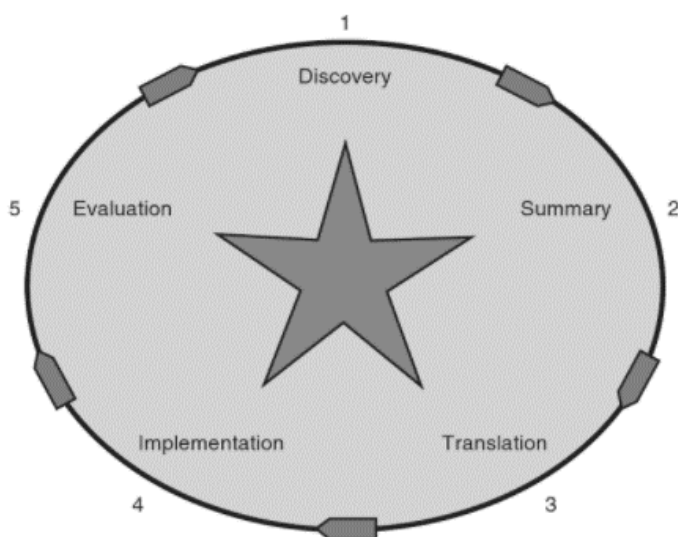
The ACE star model helps explain how various forms of knowledge such as systematic review and clinical practice guideline are solutions for moving research into practice (Melnyk & Fineout-Overholt, 2011). It is a model for understanding the different forms of knowledge that are used in stages of evidence-based practice. The model was used as a framework for identifying and specific competencies needed to employ evidence-based practice in clinical practice. This model organizes both old and new

concepts of improving care as a whole, which can serve as a framework to integrate evidence-based practice processes and approaches into practice to produce intended outcomes. The ACE star model is inclusive of standard processes and emphasizes the unique aspects of evidence-based practice because the development of this model was prompted in the early phases of the evidence-based practice movement (Melnik & Fineout-Overholt, 2015). The ACE star model positions nursing's previous scientific work within the context of evidence-based practice and serves as a guide for examining and applying the evidence-based practice (Melnik & Fineout-Overholt, 2015). The model includes five stages: (a) the discovery, which is the representation of primary research studies; (b) evidence summary is the synthesis of all available knowledge such as systematic review; (c) the translation is the combining all of the evidence base and expertise to extend recommendation; (d) the integration of evidence into practice to reflect best practice; and (e) the evaluation of the impact of the evidence-based practice (Melnik & Fineout, 2015). Models are used in practice to help search for the best evidence, critically appraise the strength of the evidence, and implement and evaluate the recommendation.

I used the situation-specific theory for this DNP project. This theory was developed in 1999 by Im and Meleis. The purpose of the theory is to link and translate research into nursing practice (Im & Meleis, 2014). Theory helps guide practice and generate models that improve nursing practice (McEwen & Wills, 2014). According to White, Dudley-Brown, and Terhaar (2016), the complexity of the health care delivery systems challenges the clinician to seek and use evidence to guide his or her practice.

This leads to clinicians no longer relying on their clinical experiences to provide care but routinely question their practices and seek alternative methods to improve the process of care. The ACE star model was developed by Stevens at the Academic Center for Evidence-Based Practice at the University of Texas Health Science Center (see Figure 1). It is a framework for systematic integration of evidence into practice. This model was designed to represent the various stages of knowledge transformation into practice and to promote the nurse's leadership and engagement with their interdisciplinary colleagues (McEwen & Wills, 2014). The model includes five stages: knowledge discovery, evidence summary, translation into practice recommendations, integration into practice, and evaluation, which are in alignment with the sedation management project. The goal of using this model is to support decision-making that will reduce inappropriate variation in sedation management practice in the pediatric critical unit while supporting the use of

best evidence-based practice.



*Figure 1. ACE star model. Adapted from Evidence-based Practice in Nursing and Healthcare: A Guide to Best Practice, by B. M. Melnyk and E. Fineout-Overholt, 2011. Copyright 2012 by Kathleen Stevens.*

### **Related Synthesis**

The evidence-based model leads evidence-based practice, providing insight into achieving best practices (Melnyk & Fineout-Overholt, 2015). The model includes domains of the nursing profession such as nursing practice, education, and research. This model is applied in both clinical and educational aspects of nursing as a strategy to employ evidence-based practice (Melnyk & Fineout-Overholt, 2015). The step begins with assessing the need for change and ends with the integration and maintenance of the practice change (Rosswurm & Larrabee, 1999). For example, the evidence-based model was used in a hospital to implement evidence-based protocol by nurses for hospitalized

patients with acute confusion. I integrated the evidence-based model with the ACE Star Model for this DNP project.

The situation-specific theory has been used in other evidence-based initiatives to improve nursing practice. Meleis is known for her middle range transition theory conceived during her PhD dissertation. In 1999, Im and Meleis proposed the development of a situation-specific theory for future theory-based nursing. They envisioned the situation-specific theories as easy-to-use theories that could be applied to nursing practice and research. Since the development of the situation-specific theory, many other situation-specific theories have been developed and published (Im & Meleis, 2014). Most of these situation-specific theories have been derived from the middle range theory. The situation-specific theory of migration transition for migrant farmworker women is cited as an example in the Im and Meleis theory (2014). The concept of a situation-specific theory was used as a theoretical framework to determine the effect of heart failure education on knowledge and readmission (Golden, 2016). The situation-specific theory was appropriate for this systematic review of nurse-driven sedation management, which focused on the pediatric critical care population.

### **Clarification of Terms**

The following terms provide clarity to this project:

*Sedation:* The administration of pharmacological agents designed primarily to induce a sedative effect in patients (Aitken et al., 2015). According to O'Connor et al. (2011), there are different type of sedations management used in pediatric such as minimal sedation, moderate sedation, and deep sedation.

*Minimal sedation:* A state in which patients respond normally to verbal command, and the ventilatory and cardiovascular functions are not affected.

*Moderate sedation:* A state where there is a depression of consciousness; patients may, however, respond purposefully to verbal command or by light stimulation.

*Deep sedation:* A state of depression in the consciousness; patients are not easily arousable but respond purposefully to painful stimulation. In this state, ventilatory function is typically impaired (O'Connor et al., 2011).

*Evidence-based nursing:* Used interchangeably with evidence-based practice in nursing (White, Dudley-Brown, & Terhaar, 2016).

*Evidence-based practice:* The integration of individual clinical expertise with the best available external clinical evidence from systematic research (Rosswurm & Larrabee, 1999).

*Evidence-based practice:* “A paradigm and lifelong problem-solving approach that involves the conscientious use of the best available evidence, with clinical expertise and patient values and preference to improve patient outcomes” (Melnyk & Fineout-Overholt, 2015, p. 604).

## **Relevance to Nursing Practice**

### **A Brief History of the Broader Problem in Nursing Practice**

Evidence-based practice is crucial to decision-making in nursing practice. There is support to increase evidence-based practice in nursing practice, and many organizations such as the Institute of Medicine, the Magnet Recognition Program of the American Nurses Credentialing Center, and Sigma Theta Tau International have designed



several initiatives to promote the advancement of evidence-based practice. The Institute of Medicine has challenged the health care profession to achieve 90% integration of the current evidence into practice by 2020 (Institute of Medicine, 2010). Although the nursing profession has embraced evidence-based practice, the concept of evidence-based nursing is still not accepted as the primary method for problem-solving in clinical practice.

Standardization of health care practices by an integration of the current science and the best evidence can reduce the unpredictable outcomes that result from the variation in care (Aitken et al., 2015). This systematic review of a nurse-driven sedation management may change the nursing practice locally, which could also lead to a state level change; acquiring a guideline can provide the latest evidence to make clinical decisions in the PICUs within the organization. Creating change for nursing in the 21st-century health care system can be found in recommendations reported in the document “The Future of Nursing: Leading Change, Advancing Health” (IOM, 2010). This report recognizes that evidence-based practice is an essential competency for all nurses.

The American College of Critical Medicine published a revised guideline in 2012 to sustain the use of evidence-based and patient-centered practice for the management of sedation in the adult critically ill patients (Barr et al., 2013). This guideline provides the essential tools for the comprehensive management of ventilated adult sedated patients. The guidelines include validated tools for the assessment and management of pain, delirium, and withdrawal. In the pediatric population, a comprehensive guideline does not yet exist to address these problems. It has been recognized in the literature that the

management of pediatric sedation is a challenge for reasons such as national and local state regulations as well as the lack of standardized practice guidelines (Gozal & Mason, 2010). In the state of New York, for example, continuous sedation is administered by nurses with an order by a licensed practitioner. Due to the limitation of state regulations, this project can provide information on the management of sedation that can be used with the compliance of governmental regulation.

Studies in the literature support the use of an evidence-based guideline in the management of pediatric mechanically sedated patients. Currently, guidelines or protocols that exist are specific to institutions and state regulates for pediatrics. In 2011, Deeter et al., implemented a nurse-driven pediatric protocol for Seattle's Children Hospital. This protocol includes an algorithm with pharmacological recommendations. With this protocol, the researcher saw a significant improvement in patients' outcomes. Furthermore, this approach empowered the nurses to safely care for their patients. A children's hospital in Germany implemented a nurse-driven guideline in the PICU; the result of this implementation was linked to positive patient outcomes and nursing satisfaction (Neunhoeffler et, al., 2015). Another international study was completed in a children's hospital in France, evaluating the impact of nurse-driven protocol (Roux et, al., 2017). This study resulted in more involvement of nursing in the care of the patient. Many of the studies include single institutions, which make recommendations for more studies needed in the area of pediatric sedation management.

### **Current Nursing Practice for Sedation and Recommendations**

The current state of nursing practice for sedation management is based on the physician's orders and nurses' clinical experiences. There is little evidence to guide PICU staff with the common clinical problems of tolerance, withdrawal, and the patient who requires long-term sedation, or those who are difficult to sedate appropriately with standard agents and stay within their scope of practice. There is a need for nursing practice improvement in sedation management, which could facilitate nurses in the decision-making of care management in collaboration with the physicians and team caring for the patient. The recommendation is to change nursing practice through professional training and experience to acquire best practice on available evidence (McCrae, 2011). Standard guidelines for sedation management are associated with improved quality and outcomes in adults (Beck & Johnson, 2008). Implementing a nursing guideline that incorporates both clinical experience and evidence-based practice is the best approach in helping nurses with decision-making in sedation management (Woiem & Bjork, 2013). Since the management of sedation is complex, this may increase the nurses' awareness and boost their confidence.

### **Previous Strategies**

The 2006 consensus guideline established a set of key recommendations for clinical practice standards in pediatric intensive care units (Playfor et al., 2006). The recommendations included guidelines that cover sedation medications, dose and administration, and the use of validated tools that assess pain, sedation, and withdrawal (Larson, Arnup, Clifford, & Evans, 2013). Sedation and analgesia are recognized as

important areas of critical care practice, and adult clinical practice guidelines in these fields remain the most popular amongst those produced by the Society of Critical Care Medicine. However, similar clinical practice guidelines have not previously been generated for the critically ill pediatric patients. There are a variety of approaches that have been used based on the physician's preference, the resources available, and the nursing staff assessment. However, the use of guidelines in adults has been shown to be beneficial.

Strategies that have been used nationally to facilitate evidence-based practice and decision-making in sedation management include the adaptation and implementation of evidence-based practice guidelines. In 2016, a nurse-driven sedation protocol was implemented in a PICU in France to evaluate daily doses of sedation (Roux et al., 2017). This protocol initiation resulted in the improvement of patients' outcomes. In the previous study that was completed with an adult population, it was noted that nurse-driven guidelines improved the nurses' confidence at managing sedation and making the decision that promotes positive outcomes in the patients' care delivery. Several other studies have been completed on various sections of sedation management, such as delirium assessment and management, withdrawal assessment and management (Deeter et al., 2011; Dreyfus, Javouhey, Denis, Touzet, & Bordet, 2017; Franck, Scoppettuolo, Wypij, & Curley, 2012). Other institutions have implemented nurse-driven sedation protocols, which include pharmacological aspects to address the management of sedation in the PICU. However, a nurse-driven guideline that facilitates comprehensive care is still needed to address the gap in the pediatric critical care.

## **Local Background and Context**

### **Summary of Local Evidence**

The practicum site for this project serves as the largest pediatric institution in the Northeast tri-state area. It consists of multiple acute care campuses and multiple ambulatory facilities. Nurses from all over the world seek employment at the site due to the varied opportunities of knowledge improvement offered through evidence translation. Even though the health care institution practice maintains its current state on the utilization of the latest evidence available, some areas in nursing practice still remain a problem and need improvement. An example is the lack of nurse-driven pediatric focused guidelines for sedation management. There is an urgent need to adapt nurse-driven pediatric guidelines for sedation management to enhance nursing practice and to support the use of the latest available best practices.

### **Institution Context**

The practicum site provides health care services to pediatric patients with acute and chronic conditions. The vision of the practicum site is to remain the number one children's hospital in the northeast region, providing the utmost innovative care that is aligned with the latest evidence-based practice. The practicum site believes in "We Put Patient First". The unit for this DNP project's intent is a 14-bed pediatric critical care unit. Primarily, 90% of the pediatric patients admitted to the unit typically require some sort of sedation to help facilitate the management of their underlying condition, such as a craniotomy for tumor resection.

**State/Federal Context**

In the United States (U.S), many organizations have federally funded evidence-based practice centers to explore clinical issues with the ultimate mission of improving healthcare quality, safety, efficiency, and effectiveness for Americans (Institute of Medicine, 2010). These organizations include the Agency for Healthcare Research and Quality (AHRQ), the health services research arm of the U.S. Department of Health and Human Services (HHS), and the Centers for Medicare and Medicaid Services (CMS). Information from AHRQ's research is available to assist individuals to make informed healthcare decisions and improve the quality of healthcare services. Every state has its own nursing practice act that ensures the safe delivery of nursing care. For this project, the safety and delivery of nursing care will be improved by complying with the New York State Board of Nursing Practice Act.

**Role of the DNP student****Student Professional Context**

I currently practice as an advanced practice nurse in pediatric critical medicine in a large medical university center. My role includes but is not limited to examining, diagnosing, treating, and promoting health and wellness for the pediatric population. My role gives me the opportunity of prescribing sedation for the management of the pediatric critically ill. Advanced practice nurses are also recognized for their skills to serve as primary system change agents to accomplish the adaptation and implementation of evidence-based practice initiatives (Gurzick & Kersten, 2010). The project took place at one of largest pediatric hospital in New York of northeast tri-states. The population

served at this site includes children with various diseases and conditions such as brain tumors. Spine deformity, metabolic disorders, neuromuscular disorders, heart disease, kidney disease, and liver disease. The practicum site is my place of employment; however, the DNP project has no relationship to my employment responsibilities.

### **Student's Role in the Doctoral Project**

My goal during this DNP project was to investigate the current best practices that existed in the literature for the best evidence-based practice available that can possibly be adapted as best practice at the practicum site that may improve nursing practice and increase nursing confidence in collaboration in the decision-making. Based on the information obtained from the evidence, I later then reviewed and summarized the evidence and made recommendations that may help enhance and improve nursing practice at the practicum. In this DNP project, my hope is to gain stakeholders' buy-in of all the key participants as well as be the change agent at the practicum site.

### **Student Motivation**

As an advanced practice nurse, my desire is to always seek ways to improve my knowledge and become an agent of change who inspires others to follow suit. As a former clinical nurse specialist, my primary role involved continuously seeking ways to improve nursing practice and patient safety. Practice that includes the integration of the most updated evidence always resonates with me. I have listened to my colleagues inquiring about the need to have a standardized nurse-driven guideline for the management of sedation in the pediatric critical care unit. This inquiry instilled in me a desire to start considering what is known about the problem and what evidence is

available which could help facilitate the adaptation of standardized practice guidelines for the pediatric critical care population.

### **Potential Biases**

According to Melnyk and Fineout-Overholt (2015), bias can be introduced at any point during a study. One needs to be aware of the possible sources of bias. A potential bias for this doctoral project is for the DNP student to note and consider the stakeholders' opinions and values about the project.

### **Role of the Project Team**

The DNP project team included this DNP student, the student's practicum mentor, the unit manager, nurses, and the practice council at the practicum site. The teams will be used to aid the dissemination of the DNP project results and to possibly help facilitate the project recommendation implementation at the local site. The doctoral project was presented to the teams, outlining the problem which the DNP project is addressing at the local site. The evidence obtained about the problem from existing literature were included in the presentation. The teams were given an opportunity for feedback and to share their expertise and insights related to the doctoral project from the presentation. The teams were allotted time to return their feedback to the DNP student.

### **Summary**

Nurses hold the duty and trust to provide excellent care to the patient. The evidence-based practice model facilitated the literature review of the nurse-driven management of sedation. The DNP project may result in the adoption of a nurse-driven guideline for nurses to guide their practice. The following section will include the sources



of evidence that were used to guide the synthesis of the literature review that will be discussed. The analysis and synthesis of evidence for the DNP project will also be addressed in this section.

### Section 3: Collection and Analysis of Evidence

#### **Introduction**

Sedation management in the pediatric population is challenging because of limited published guidelines in this area. The objective of this DNP project was to investigate and synthesize evidence that can be used as a recommendation to adopt a standard practice for nursing in the management of sedation in pediatric critical care. For this project, I reviewed and identified evidence-based approaches for the management of sedation in the pediatric critical care unit to include the nursing role in the care of these patients. Nursing staff at the site can be overwhelmed when making decisions about whether patients are appropriately sedated or not. Nursing care at the practicum site is the foundation of the institution, as the patients and families rely on nurses to provide the best care that is aligned with the best available evidence published. This DNP project will help nurses continue the safest care to patients while collaborating with the team. In this section, I will provide the sources of evidence and an overview of the methodology used in evidence searches, such as the process of selecting and exclusions criteria, as well as an analysis and synthesis of the system used to organize and record the evidence obtained.

#### **Practice-focused Question**

Currently, the nursing practice of managing sedation in the PICU is guided by clinical judgment and experience level. Patients may be negatively affected by a lack of evidence-based guidelines. The practice-focused question of this doctoral project was “What are the best practices available that can be used to support the nursing

management practice of sedated patients in the pediatric intensive care unit?” The project is significant to practice, as it is expected to reduce the variation in practice for pediatric sedation management for nursing practice with the recommendation provided from the systematic literature review.

### **Clarifying the Purpose**

The purpose of this doctoral project was to evaluate and synthesize evidence-based research on nurse-driven sedation management that can be used to make a recommendation for the adoption of a nurse-driven guideline for sedation management in the PICU. This approach aligns with the practice-focused question, as the evidence that was collected provided information that supports a recommendation for evidence-based practice guidelines in the clinical nursing practice for pediatric sedation management in the critical unit. This evidence-based data can provide a standard, already validated tool for a nurse-driven sedation guideline for the pediatric critical care unit. As a result, this review can be implemented and used as the best approach in care management.

### **Sources of Evidence**

The purpose of this project was to evaluate and synthesize the best available evidence relevant to nurse-driven sedation management that can be recommended to improve the existing nursing practice of sedation management in the PICU. The source of evidence used to address the practice-focused question was current literature. A review of the literature indicated that sedation management in pediatrics is a challenge worldwide. A systematic review of both primary and secondary sources of peer-reviewed journal articles and published guidelines came from CINHALL, PubMed, Walden Library,

Cochrane library, Joanna Briggs Institute and Medline. The 2013 clinical practice guidelines for management of pain, agitation, and delirium in adult patients in the intensive care unit was used to guide the recommendation of the nurse-driven guideline for pediatric patients (Barr et al, 2013). Clinical specialty organizations such as American Critical Nurses, American Critical Care of Medical, and American Academy of Pediatrics will be accessed for current evidence that can be used in the recommendation guideline. The evidence will be found from qualitative, quantitative and mixed methods studies.

### **Relationship of the Evidence to the Purpose**

The purpose of this doctoral project is to evaluate and synthesize the best available evidence that can be used to recommend a nurse-driven guideline. The evidence gathered from the literature will provide the information needed to guide the recommendation of the guideline. Numerous strategies have been used in the management of pediatric sedation. It is essential to exhaust the literature to seek validation for the best practice.

### **Evidence to address the Practice-focused Question**

The collection and analysis of evidence will facilitate the approach to decision-making in evidence-based nursing. The articles were selected from strategy search including key words such as pediatric sedation management, sedation in PICU, nurse-driven sedation management, sedation management and evidence-based guideline for sedation. Synthesizing all the evidences gathered will be crucial to obtaining the appropriate information needed to answer the focused-practice question. The search procedure resulted in a total of 17 articles used for this systematic review. The search

procedure begins by using CINAHL, the search key word used was nurse-driven sedation pediatric guideline.

### **Databases and Search Engines**

The Peer-reviewed articles will be accessed from online databases, such as CINAHL, Google Scholar, Walden Library, Joanna Briggs Institute, Medline, Cochrane, and PubMed. In addition, official websites such as the American Academy of Pediatrics, Society of Critical Care Medicine, and American Association of Critical-Care Nurses will be accessed for additional resources. Additional search engines such as Google Scholar will be used as well to obtain articles.

### **Key Search Terms and Combinations of Search Terms**

The Search terms will include key words such as pediatric sedation management, sedation in PICU, nurse-driven sedation pediatric guideline, sedation management and evidence-based guidelines for sedation.

### **The Scope of this Review**

The purpose of the literature search is to gather the relevant information as it relates to nurse-driven sedation management to serve as evidence for the recommendation of a nurse-driven guideline. The searches will be limited to 2006–2017. The articles were selected if the author(s):

1. Addressed the nursing management of sedated patient
2. The articles are relevant to the management of sedation

Articles were excluded if the article(s):

1. They were not relevant to nursing sedation management

2. They were not full text articles
3. They were not relevant to sedation management
4. They were published prior to 2006

### **Search Exhaustive and Comprehensive**

The search will be exhaustive by using various search terms and phrase combinations that cover the practice-focused question and the target population. The articles selected were read in full to include and exclude based on the selection criteria. Additionally, abstracts and articles references list was reviewed to ensure the search is exhaustive.

### **Institutional Review Board**

The protection of human rights is not an issue with this project directly since this is a systematic review of literature. However, an application for a full approval of the institutional review board obtained from Walden University to ensure that all rights are protected. The data will be gathered from the literature review. The information gathered will be from already approved institutional review boards. The approval number is 10-23-17-0657303.

### **Analysis and Synthesis**

#### **Systems used for Recording, Tracking, Organizing, and Analyzing the Evidence**

The evidence obtained will be manually organized and recorded in a Microsoft Word matrix table. The articles are broken down by the year in which they were published, authors, title, purpose, sample, design, and findings into various columns in the matrix table (see Appendix A). The data will be organized using the levels of

evidence Melnyk hierarchy pyramid (Melnyk & Fineout-Overholt, 2011); see Appendix B for illustration. The search procedure begins by using CINAHL, the search key word used was nurse-driven sedation pediatric guidelines. The initial search resulted in a total of 1445 articles, which was narrowed down to full text for 456 articles, references available resulted 151, publication year from 2006 to 2017 were 129 articles, within six years limit to 79, five years yielded 72 articles, which were further reviewed for addition criteria based on the relevant to the practice question resulted in 17 relevant articles. The PRISMA flowchart diagram shows an illustration for the articles selection procedure (see Appendix C).

### **Analysis Procedure**

The analysis procedure used in the doctoral project is the evidence obtained that will be categorized based on the strength of the evidence. The strongest evidence will be selected to propose or recommend a nurse-driven sedation guideline. The data analysis will be used to recommend the nurse-driven sedation guideline.

### **Summary**

The goal of this project is to provide recommendation that can help address the gap of lack of nurse-driven pediatric sedation guidelines. The outcomes of this systematic review will help enhance nursing practice as well as improve patients' outcomes in the pediatric critical care unit. The nurse-driven pediatric sedation guideline project has the potential to improve safety in the healthcare organization once the recommendation is implemented. The next section will include the findings and recommendations from the systematic review and their implications for the focused-practice question.

## Section 4: Findings and Recommendations

### **Introduction**

Nurses play a significant role in the management of sedation for mechanically ventilated patients in the PICU. Sedation management can be affected by several variables such as the experience level of the nursing staff, the amount and the duration of sedation, the level of nursing skills, as well as the patient's hemodynamic response. Evidence-based practice is important to the care that nurses provide in the clinical area. The absence of evidence-based nursing guidelines for assessing patients has led to ineffective management in the care of mechanically ventilated patients (Vet et al., 2013). Evidence has shown that without clear guidelines in place, patients' length of stay increases, resulting in unnecessary sedation, and increased hospital costs (Roux et al., 2016). Nursing care at the practicum site is the foundation of the institution, as the patients and families rely on nurses to provide care that is aligned with published evidence. The benefits of using an evidence-based nurse-driven guideline offer a variety of structures that support the safety and effectiveness of nursing care delivery. Not only does it improve patient care, but it also provides nurses with the tools to collaborate with the medical providers when making-decisions based on best practices. A gap in nursing practice exists when evidence-based practice guideline to support nursing practice in the management of pediatric sedation is not available. The purpose of this project was to synthesize evidence relevant to nurse-driven sedation management to improve the existing nursing practice of sedation management in the PICU.



The practice-focused question used to facilitate this DNP project was “What are the best practices available that can be used to support the nursing management practice of sedated patients in the pediatric intensive care unit?” Primary sources such as peer-reviewed evidence used to support this systematic literature review. These articles were retrieved from Medline, PubMed, Cumulative Index of Nursing and Allied Health Literature, Joanna Briggs institute database, and Google Scholar. The articles were included if they met the inclusion criteria and were excluded from the review if they did not meet the criteria.

The search terms used were *nurse-driven sedation pediatric guidelines*, *pediatric sedation guideline*, and *nurse-driven sedation guidelines*. The data were included if they met the search inclusion criteria. The data analysis matrix table includes authors, publication year, the purpose of the study, methodology used in the study, and level of evidence. The summary and findings are included in the analysis table in Appendix A.

### **Findings and Implications**

The literature review resulted in a total of 1,445 articles; 989 articles were excluded due to lack of full text; however, abstracts were reviewed for relevant information. From the screening process, 305 articles were removed for lack of available references. The eligibility involving the recent publication timeframe yielded 129 articles, which were further narrowed to a 5-year publication timeframe. The analysis resulted in ( $n=17$ ) articles meeting the relevant review criteria for the review selection procedure (see Appendix C). The inclusion criteria for this systematic literature review included a) articles addressing nursing management of sedation, b) articles relevant to the

management of sedation, c) full-text articles; however, Walden library was contacted to explore access for full-text data and d) all articles within the accepted publication dates.

Three systematic reviews were included in this literature review. Aitkens et al., (2015) conducted a Cochrane systematic review of a randomized controlled trial to assess the effects of protocol-direct on adult sedation management on the duration of mechanical ventilation and the relevance to patient outcomes in mechanically ventilated intensive care unit patients. The majority of the studies reviewed by Aitken et al were randomized controlled trials (RCT) and quasi-randomized control trial. This study found limited evidence available to evaluate the effectiveness of protocol-direct sedation management on patient outcomes (Aitken et al., 2015). The second systematic review focused on the evaluation of the impact of sedation guidelines, protocols and algorithms on clinical outcomes in PICU. Most of the studies included in this review by Poh, Poh, Buang & Lee (2014) were observational studies involving historical control. This study found an association between clinical outcomes such as reducing the length of stay, drugs withdrawal, unplanned extubation and total sedation duration. This study found that 23% of patients were more likely to be taken off sedation compared to the group who were managed by non-sedation guideline (Poh, Poh, Buang & Lee, 2014). It was also found that the use of sedation guidelines to manage sedation in critically ill children and adults have been strongly recommended due to improved outcomes (Poh, Poh, Buang & Lee, 2014). The third systematic review focused on examining the reported incidences of “under, optimal and over” sedation in critically ill children in the intensive care unit. This study concluded optimal sedation remains a challenge in the pediatric critical care unit

(Vet et al., 2013). It was also found that over-sedation is more common in critically ill children than adult population (Vet et al., 2013). This study also reported across all studies reviewed, 31.8% children were over-sedated (Vet et al., 2013). The study recommended further research for conclusive evidence on optimal sedation strategies in the PICU setting (Vet et al., 2013). One prospective randomized controlled trial focused on the feasibility of daily interruption of sedatives in critically ill children. This study showed significant improvement with outcomes such as decreasing length of stay, shorter duration of mechanical ventilation and decreased the used of sedatives in this population (Verlaat et al., 2013).

The remaining studies (n=14) shared similar findings of improving patient outcomes such as reducing length of stay, decreased mechanical ventilation day and reducing sedatives used in critical care patients, of which 82.4% studies reviewed. Two prospective study, three retrospective studies, one quasi-experimental uncontrolled before and after study, two descriptive studies, two pilot studies, one exploratory qualitative study and three case-controlled studies. Most of the studies addressed the benefits of sedation guidelines in improving patient outcomes (n=9). The findings indicated that nurse-driven guideline enhances nursing practice in collaboration in clinical decision-making (n=5). Five studies (n=5) addressed that sedation improved the intensive care unit patient length of stay, of which 29.4% of the studies reviewed. Five studies (n=5) showed implementing a sedation guideline decreased mechanical ventilation days in the critical care unit, of which 29.4% of the studies reviewed.

### **Limitations/Potential Impact on Findings**

Most of the studies (n= 9) resulted in improvement in patients' outcomes with the exception of one to three studies that did not find any significant difference. Deeter et al., (2011) found that the utilization of nurse-driven in the pediatric critical care unit significantly decreased sedation days in the PICU. Roux et al (2017) found that the implementation of a nurse-driven sedation protocol in the PICU helped in decreasing the duration of mechanical ventilation. Poh, Poh, Buang & Lee (2014) found significant improvement in length of stay in the PICU with protocol-direct sedation management. Aitken et al (2015) found a significant difference in the direction of the length of stay and mechanical ventilation days. DeGrado, Anger, Szumita, Pierce & Massaro (2011) found a significant improvement in sedation metric with an implementation of sedation guideline ( $P < 0.001$ ). Dreyfus, Javouhey, Denis, Touzer & Bordet (2017) found with the implementation and evaluation of a pediatric nurse-driven sedation protocol in a PICU that the duration of mechanical ventilation was significantly lower. However, no difference was found between sedation withdrawal symptoms. Lack of randomized controlled trials were noted as limited factors in multiple studies (Aitken et al., 2015)

### **Implication for Social Change**

This systematic literature review supports the need for an available evidence-based nurse-driven guideline for nurses to collaborate with the medical team in the management of pediatric sedation. An adaptation of an evidence-based practice guideline will result in the enhancement of nursing practice. Nurses will be able to monitor and measure the effects of interventions in the patients' care with guided evidence (Bugeo et

al, 2013). The findings of this systematic literature review will address the gap, which will ultimately improve the safety and outcomes at the local clinical practicum site. This has an implication for nursing and social change.

### **Recommendations**

After analyzing and synthesizing the data collected for the project to the project team, it was recommended that the project would have a significant influence on the nursing practice at the project site. The recommendations concluded from this systematic review also revealed the needs for study to be conducted using pediatric population. This will validate the implication of a nurse-driven guideline in the management of pediatric sedation.

### **Plan to Extend Beyond DNP Project**

This DNP project will be continued post the doctoral project phase in collaboration with the project site team and local IRB office to possibly implement a nurse-driven guideline. The implementation of this project is a very time-consuming endeavor. It requires time to pilot the project and the evaluation of the effectiveness of the project prior to full implementation. Due to the sensitivity of the intended pilot population, I foresee this project will need a time frame of six months to a year from pilot to full implementation.

### **Contribution of the Doctoral Project Team**

The final doctoral project was presented to the teams, outlining the current problem that the DNP project is addressing at the project site. The evidence obtained about the problem from existing literature was included in the presentation. The team was given an opportunity to give feedback based on the recommendation and shared their expertise and insights related to the doctoral project from the presentation. The project

team roles in this final recommendation is essential as the plan for the project implementation will be up to their acceptance of the recommendations provided from the project.

### **Strengths and Limitations of Doctoral Project**

The strength of this DNP project was the knowledge gained throughout the process of this project. A large source of evidence and data with favorable outcomes were noted in the literature in the adult population even though it was limited in the pediatric population. There is little evidence in the literature regarding the impact of nurse-driven sedation management in the pediatric population. This project provided an excellent opportunity to share the knowledge obtained with frontline nurses as well as the leadership team within the project site. Another strong point of this project is the possibility provided to also share this knowledge nationally. The summary of the project can be used to help the nursing leadership with decision-making on initiatives in improving nursing practice. The limitation of this project included the lack of actual research studies from the pediatric population. The lack of a pediatric population led the inability to validate this project benefit in the pediatric critical care unit.

### **Recommendations for Future Project**

Based on the analysis and synthesis of this review, several studies demonstrated the lack of evidence in pediatric sedation management. This review revealed the demand for more research to be done on this topic and specific population. The results of the review concluded that the adoption of evidence-based practice guideline improves positive patients'

outcomes and as well as improving nursing practice. Further research is needed in this area since the review produced lack of comprehensive guidelines in the pediatric population.

## Section 5: Dissemination Plan

### **Introduction**

The impact of evidence-based practice is prevalent across the nursing practice and by investigating it's relevance and incidence can lead to plans on how to disseminate the information gathered. This new knowledge must be transformed into clinical practice to achieve better patient outcomes. Sedation management in the pediatric population is challenging due to the limited published guidelines and nature of this specific population. The purpose of this project was to evaluate and synthesize evidence on nurse-driven sedation management, which would lead to a recommendation that would improve sedation management in the PICU. The findings were intended to inform nursing leadership and recommend adopting a new strategy for the management of pediatric sedation. The synthesis of project results can be disseminated to the practicum site leadership through this literature review project.

### **Audiences for Dissemination**

The primary audience for this project dissemination is the nursing staff at the PICU of the project site. The stakeholders involved in supporting this project include the director of critical care nursing, unit manager, and the practicum site mentor. To disseminate the project findings to the intended audience, a final oral PowerPoint presentation will be presented. The presentation included the project findings and recommendations. The findings of this project may promote and support other changes in nursing practice for the pediatric intensive care unit. To share the knowledge learned from the findings of this project with other pediatric critical care units, I plan to look for



the opportunity to participate in a poster presentation and submission of an abstract to several nursing journals of interest.

### **Analysis of Self**

#### **Challenges/Solutions/Insights Gained**

My journey to the doctoral nursing practice program started in 2016, to grow professionally at the post master level and as a fulfillment for self-improvement. I saw an opportunity to promote and share my knowledge of evidence-based practice by improving nursing practice. Evidence-based practice is the cornerstone to problem solving, as I thought about my DNP project, I spoke with my nursing colleagues and listened to their areas of concern. I realized that evidence-based practice is not part of every nurse's practice at the project site. I have gained great appreciation for evidence-based practice from my previous experience as a clinical nurse specialist. However, embarking in the DNP program allowed me to gain a greater knowledge on the importance of the evidence-based practice starting from my first practicum experience to my didactic courses. I have grown immensely, both personally and professionally in my doctoral program journey.

My professional role in nursing is an advanced practice care provider, with a specialty in pediatric critical care nursing. Over the years of my nursing experience, I have worked as a staff nurse and clinical nurse specialist. Each of these roles has prepared me for where I am in nursing today as a professional nurse leader. Because the nursing practice varies based on the population, my goal through this program was to address and adapt an evidence-based practice guideline that may assist in decreasing the

variations in nursing practice for pediatric critical nursing. One of the challenges that I foresaw was the resistance to change, because adopting evidence-based practice has barriers and benefits. I have learned many strategies through my practicum experiences to address the barriers of resistance to change. My leadership experience has enabled the opportunity to successfully implement evidence-based practice.

### **Summary**

Sedation management is challenging in the pediatric population, yet it is an essential component of the nursing care in the PICU. The outcomes such as how quickly a patient extubated and recovered with fewer complications are based on how well the sedation is managed. I conducted a systematic literature review to examine and summarize evidence that can be used to recommend a nurse-driven guideline. This systematic literature review can provide nurses with a tool that may help in collaboration with the medical team to efficiently manage pediatric sedation. Despite the lack of a clear guideline for pediatric sedation management in pediatric critical care, existing partial guidelines can be trialed while incorporating the missing guidance. Further research should be conducted to confirm these findings as well as to determine the relationship between using evidence-based nurse-driven guidelines and patient outcomes. As the recommendations of the project findings are provided to the project site, it rests with the project site to implement the project.

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## Appendix A: Table of Evidence

Table A1

*Analysis and Synthesis of Evidence*

Author(s)	Title	Purpose	Setting	Population	Design	Finding(s)	Level of Evidence
Aitken, L. M., Bucknall, T., Kent, B., Mitchell, M., Burmeister, E., & Keogh, S. (2015)	Sedation protocols to reduce duration of mechanical ventilation in the ICU: A cochrane systematic review	The purpose of this study was to assess the effects of protocol-directed sedation management on the duration of mechanical ventilation and other relevant patient outcomes in mechanically ventilated intensive care unit patients	Hospital intensive care units	All ICU patients who were mechanically ventilated	Cochrane systematic review of randomized controlled trials	This study found limited evidence from RCTs is available to evaluate the effectiveness of protocol-directed sedation on patient outcomes. It also indicates that further research is needed in this area	I
Vet, N. J., Ista, E., Wildt, S. N., Dijk, M. V., Tibboel, D., & Hoog, M. D. (2013).	Optimal sedation in pediatric intensive care patients: A systematic review	The purpose of this systematic review was to examine reported incidences of under-, optimal, and oversedation in critically ill children receiving intensive care	Pediatric intensive care units	Study population were PICU patients age 0-18 on mechanical ventilation and receiving continuous sedation	Systematic review	The study finding indicates that oversedation sedation in critically ill children is more common than undersedation	I
Verlaat, C. W., Heesen, G. P., Vet, N. J., Hoog, M. D., Hoeven, J. G., Kox, M., & Pickkers, P. (2013)	Randomized controlled trial of daily interruption of sedatives in critically ill children	This study purpose was to evaluate the benefit of daily interruption of sedative in critically ill children	Tertiary hospital PICU	Children receiving mechanical ventilation and sedation	Prospective randomized controlled open-label trial	The study resulted in decrease use of sedation, early extubation and decrease length of stay in critically ill	II

*(table continues)*

Author(s)	Title	Purpose	Setting	Population	Design	Finding(s)	Level of Evidence
Deeter, K. H., King, M. A., Ridling, D., Irby, G. L., Lynn, A. M., & Zimmerman, J. J. (2011)	Successful implementation of a pediatric sedation protocol for mechanically ventilated patients*	The study's purpose was to evaluate the effect of a nurse-driven sedation protocol for mechanically ventilated pediatric patients on duration of use of analgesic and sedative medications	Thirty-one bed tertiary care, medical-surgical-cardiac pediatric intensive care	Children requiring mechanical ventilation longer than 48 hrs	Retrospective cohort study with historical control	Nurse-driven protocol significantly decreased unnecessary sedation -Improved positive change among healthcare team post implementation of nurse-driven protocol	II
Roux, B. G., Liet, J., Bourgoin, P., Legrand, A., Roze, J., & Joram, N. (2017)	Implementation of a Nurse-Driven Sedation Protocol in a PICU decreases daily doses of midazolam	The purpose of this study was to evaluate the impact of a nurse-driven sedation protocol on the length of mechanical ventilation, total daily doses of sedatives, and complications of sedation	Twelve beds surgical and medical PICU	Pediatric patients between the age of 28 days to 18 years requiring mechanical ventilation and continuous sedation	A single-center prospective study	The implementation of nurse-driven protocol result in decreased of the duration of mechanical ventilation in the older patients	II
Yaghmai, B. F., Gennaro, J. L., Irby, G. A., Deeter, K. H., & Zimmerman, J. J. (2016)	A Pediatric Sedation Protocol for Mechanically Ventilated Patients Requires Sustenance Beyond Implementation*	This study purpose was to evaluate the effect of a nursing-driven sedation protocol for mechanically ventilated patients on analgesic and sedative medication dosing durations.	45 beds tertiary care, medical-surgical cardiac PICU	Children requiring mechanical ventilation and sedation in the PICU	Quasi-experimental, uncontrolled before and after study	The study concluded after the initiation of the protocol, sedation quality improvement measured related to the use of opiate infusion, PICU length of stay and mechanical ventilation day decrease	III

(table continues)

Author(s)	Title	Purpose	Setting	Population	Design	Finding(s)	Level of Evidence
Dreyfus, L., Javouhey, E., Denis, A., Touzet, S., & Bordet, F. (2017)	Implementation and evaluation of a paediatric nurse-driven sedation protocol in a paediatric intensive care unit	The aim of this study was to evaluate the impact of a nurse-driven sedation protocol implemented at a PICU on the duration of mechanical ventilation, total dose of sedatives, length of stay in the PICU, incidence of ventilator-associated pneumonia, and occurrence of withdrawal symptoms	23-bed medical - surgical PICU	Children receiving mechanical ventilation and continuous sedation, nurses and physicians	Case controlled (no randomization)	Withdrawal symptoms were less frequent in the post-implementation period, the duration of mechanical ventilation and daily dose of sedative were decrease as well.	III
Neunhofer, F., Kumpf, M., Renk, H., Hanelt, M., Berneck, N., Bosk, A., . . . Hofbeck, M. (2015)	Nurse-driven pediatric analgesia and sedation protocol reduces withdrawal symptoms in critically ill medical pediatric patients	This study's purpose was to evaluate the effects of a nurse-driven goal-directed analgesia and sedation protocol for mechanical ventilation, pediatric intensive care unit length of stay, total doses of opioids and benzodiazepines, and occurrence of withdrawal symptoms	14-bed medical - surgical cardiac PICU	Nurses and physicians	Case control study	Implementing a nurse-driven protocol resulted in decreased of withdrawal symptoms in critically ill children	III
Bugedo, G., Tobar, E., Aguirre, M., Gonzalez, H., Godoy, J., Lira, M. T., & Ugarte, H. (2013)	The implementation of an analgesia-based sedation protocol reduced deep sedation and proved to be safe and feasible in patients on mechanical ventilation	The purpose was to evaluate the clinical practice of analgesia and sedation in critically ill patients who require mechanical ventilation for more than 48 hours	13 ICUs from multicenter	Patients older than 18 anticipated requiring mechanical ventilation longer than 48 hours	Prospective two-phase nonrandomized multicenter study	Nurse-driven protocol did not show significant differences in major outcomes	III

(table continues)

Author(s)	Title	Purpose	Setting	Population	Design	Finding(s)	Level of Evidence
Keogh, S. J., Long, D. A., & Horn, D. V. (2015)	Practice guidelines for sedation and analgesia management of critically ill children: A pilot study evaluating guideline impact and feasibility in the PICU	To develop and implement guidelines for sedation and analgesia management in the PICU and evaluate the impact	Two PICUs at different hospitals in Australian metropolitan city	Patients admitted to the PICU and ventilated for more than 24 hrs	Pilot study, pre- and post-design using historical control	No change in ventilation duration days	IV
Poh, Y. N., Poh, P. F., Buang, S. N., & Lee, J. H. (2014)	Sedation Guidelines, Protocols, and Algorithms in PICUs	To evaluate the impact of sedation guidelines, protocols, and algorithms on clinical outcomes in PICUs	Pediatric intensive care unit	Pediatric patients	Systematic review	The use of sedation guidelines in critically ill children remains a focus. However, few pediatric studies available.	V
Varndell, W., Fry, M., & Elliott, D. (2015)	Emergency nurses' perceptions of sedation management practices for critically ill intubated patients: a qualitative study	To explore factors influencing practices in assessing, titrating and managing sedation for critically ill intubated patients, for the perspective of emergency nurses	Emergency department	Experienced emergency nurses	Descriptive qualitative study	The use of self-directed clinical workbook and supervised clinical practice alone are not sufficient to prepare nurses to manage critically ill patients requiring sedation	V

*(table continues)*

Author(s)	Title	Purpose	Setting	Population	Design	Finding(s)	Level of Evidence
Beck, L., & Johnson, C. (2008)	Implementation of a nurse-driven sedation protocol in the ICU	To evaluate the perceived benefits of implementing a standardized nurse-driven sedation protocol in the ICU	22-bed adults intensive care unit	Nurses who in the ICU during the implementation of sedation protocol	Descriptive study	The protocol gives the nurses a consistency approach of managing sedation	VI
DeGrado, J. R., Anger, K. E., Szumita, P. M., Pierce, C. D., & Massaro, A. F. (2011).	Evaluation of a local ICU sedation guideline on goal-directed administration of sedatives and analgesics	To evaluate adherence to a sedation guideline with both sedative prescribing and documentation of Richmond Agitation-Sedation Scale(RASS) scores	Medical ICU	Patients on mechanical ventilation and receiving continuous sedation	Retrospective review study	Improvement on sedation metric as well frequency of sedation assessment and documentation with the guideline implementation	VI
Wøien, H., & Bjørk, I. T. (2013)	Intensive care pain treatment and sedation: Nurses' experiences of the conflict between clinical judgement and standardized care: An explorative study	To examine nurses' experiences of performing clinical judgements of patient pain and sedative requirement after implementation of assessment tools, and how the tool influenced their judgement	Hospital setting	Nurses caring for patients receiving continuous sedation	Exploratory qualitative study, using focus group interview	The use of protocol improves the quality of pain control and sedation and supported nurses in their decision-making	VI
Larson, G. E., Arnup, S. J., Clifford, M., & Evans, J. (2013)	Corrigendum to "How does the introduction of a pain and sedation management guideline in the pediatric intensive care impact on clinical practice? A comparison of audits pre- and post-guideline introduction"	To evaluate the impact of introduction of a pain and sedation guideline will have on clinical practice	19-bed pediatric ICU	Pediatric patient from birth to 18	Case trial study	Positive changes occurred after the introduction of pain and sedation management guidelines	VI

(table continues)

Author(s)	Title	Purpose	Setting	Population	Design	Finding(s)	Level of Evidence
Barr, J., Kishman, C. P., & Jaeschke, R. (2013)	Clinical Practice Guidelines for the Management of Pain, Agitation, and Delirium in Adult Patients in the Intensive Care Unit	Purpose of this paper was to revise the "Clinical Practice Guidelines for the Sustained Use of Sedatives and Analgesics in the Critically Adult" published in Critical Care Medicine in 2002	Taskforce from multiple institutions	Experts in critical care	Clinical Experts	The study resulted in a guideline for preventing and treating pain, agitation, and delirium in critically ill patients	VII

## Appendix B: Level of Evidence Hierarchy

Table B1.

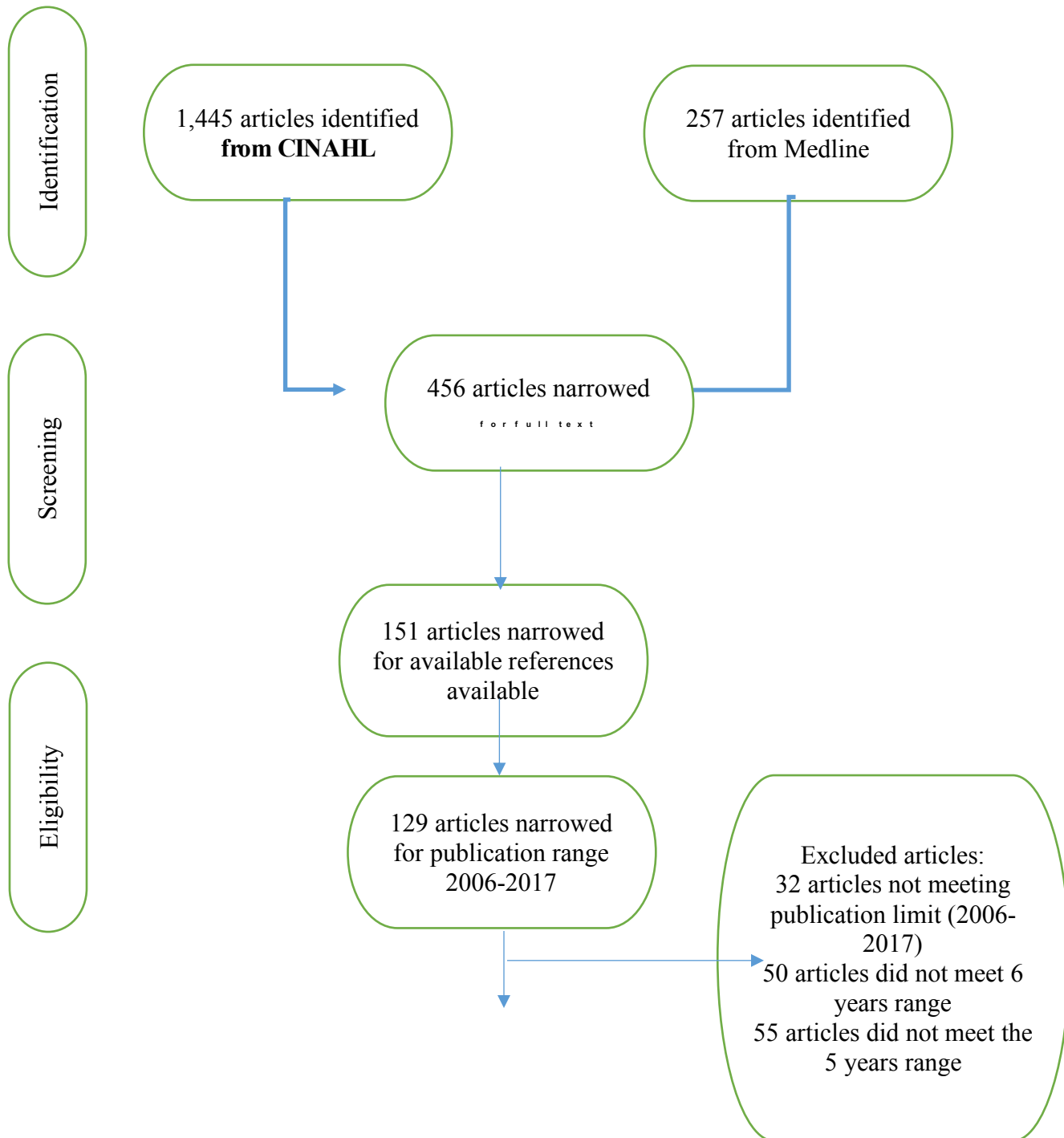
*Level of Evidence Pyramid Hierarchy*

Level	Description of evidence
I	Systematic review and meta-analysis of randomized controlled trials
II	One or more randomized controlled trials
III	Controlled trial (no randomization)
IV	Case-control or cohort study
V	Systematic review of descriptive and qualitative studies
VI	Single descriptive or qualitative
VII	Expert opinion

*Note.* Melnyk and Fineout-Overholt (2011) designed this level of evidence hierarchy.

## Appendix C

Flowchart search results





Included

17 articles included in  
the systematic review