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## Using Collaborative Objective Simulation Clinical Evaluation with Undergraduate Nursing Students and Nurse Anesthesia Students Labor Epidural Placement in an Active Labor Patient

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USING COLLABORATIVE OBJECTIVE SIMULATION CLINICAL EVALUATION  
WITH UNDERGRADUATE NURSING STUDENTS AND NURSE  
ANESTHESIA STUDENTS LABOR EPIDURAL PLACEMENT  
IN AN ACTIVE LABOR PATIENT

by

Chaka Jackson and Aisha Pierre

A Doctoral Project  
Submitted to the Graduate School,  
the College of Nursing and Health Professions  
and the School of Leadership and Advanced Nursing Practice  
at The University of Southern Mississippi  
in Partial Fulfillment of the Requirements  
for the Degree of Doctor of Nursing Practice

Approved by:

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## ABSTRACT

Developing interdisciplinary teamwork and patient communication skills are essential for the student registered nurse anesthetist (SRNA) to provide quality patient care when administering epidural anesthesia. The synthesis of the evidence revealed limited available information on simulation use for SRNA epidural administration and collaboration. This doctoral project examined the effectiveness of learning through traditional simulation to enhance communication and collaboration between the Bachelor of Science in Nursing (BSN) and the Nurse Anesthesia Program (NAP) students. The BSN and NAP students were provided with a simulation environment to care for a laboring patient while improving patient safety and quality outcomes. The project comprised 5 collaborative simulation sessions lasting 15 to 20 minutes, each with 5 NAP and 5 BSN students.

A Scenario Planning Worksheet with objectives and checklist were provided to BSN participants. An Epidural Objective list and Checklist was provided to NAP participants. Each participant was given a Likert Scale Survey, Debriefing Survey, and Focus Group Questionnaire for evaluation of the effectiveness of the simulation. During the simulation experience, each participant performed well in skills such as verifying pertinent patient information, history, and physical assessment. Each participant had communication deficiencies within the groups such as the process of initiating a timeout before the procedure, communicating signs and symptoms of local anesthetic intravascular injection to the patient, and continued collaboration with the team member throughout the simulation. The project was beneficial overall based on the finalized mean

results of the participants, BSN 83% and NAP 93%, suggesting the simulation improved clinical performance, teamwork, communication, and was a valuable learning experience.

## ACKNOWLEDGMENTS

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## DEDICATION

*Aisha Pierre*

I would first like to dedicate this project to the Almighty God. Thank you for guidance, strength, knowledge, and protection and for always being on time with many blessings. Secondly, I want to like to dedicate this project to my loving husband, Joseph Pierre, who has always been encouraging, supportive, understanding and has stepped up to the plate as the sole provider. Thanks for standing in the gap for our family when I was not able to. I love you immensely. To my two sons, Joseph W. Pierre and Josiah Pierre, mama loves you and wants you always to remember that I am doing this all for you. Last but not least, I would like to dedicate this project to my family. My mom, Lois Paul, and my late father, Willie Paul Jr, if it was not for you two, I am not sure where or what I would be in life. I miss you, daddy, and I wish you were here to witness me become what you have always dreamed of me to be. To my siblings Tejerria S. Allen, Hasanati Johnson, and Tramall Paul; I love you guys, and thank you for consistently being my cheerleaders.

*Chaka Jackson*

Nolan, you are love defined, the very best gift of anesthesia school, and the source of my motivation and resilience. Decarlo, you have been supportive through the challenges, tears, and struggles of making this dream come to fruition. Thank you. Joann, you are always in my heart. If it was not for you, I would not know the impact that one person can make on the world.

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## LIST OF ABBREVIATIONS

<i>AACN</i>	American Association for Colleges of Nursing
<i>BPG</i>	Best Practice Guidelines
<i>BSN</i>	Bachelor of Science in Nursing
<i>CINAHL</i>	Cumulative Index to Nursing and Allied Health Literature
<i>CNHP</i>	Certified National Health Professionals
<i>DNP</i>	Doctor of Nursing Practice
<i>FHR</i>	Fetal Heart Rate
<i>IVF</i>	Intravenous Fluid
<i>NAP</i>	Nurse Anesthesia Program
<i>NKA</i>	No Known Allergies
<i>NLN</i>	National League of Nursing
<i>OSCE</i>	Objective Structured Clinical Examinations
<i>RN</i>	Registered Nurse
<i>SIM</i>	Simulation
<i>SMART</i>	Specific, Measurable, Achievable, Realistic, Timely
<i>SRNA</i>	Student Registered Nurse Anesthetist
<i>USM</i>	The University of Southern Mississippi

## CHAPTER I - INTRODUCTION

Simulation (SIM) education can help to develop knowledge of professional roles that can improve student communication and collaboration skills. This doctoral project implemented an educational teaching simulation to enhance interprofessional collaboration and therapeutic communication techniques for student registered nurse anesthetists (SRNAs) during an epidural catheter placement for a laboring mother. According to Pellegrini (2018), patient perceptions and fears can be diminished with thoughtful explanation and discussion of the expectations regarding the patient's case (p. 1020). The project focused on collaboration, therapeutic communication, and simulation teaching methods to allow the SRNA to identify and address knowledge deficits when caring for a patient in active labor before, during, and after placement of an epidural catheter.

### Background

Anesthetists are responsible for ensuring the safety of patients throughout the epidural procedure (Pellegrini, 2018). Developing interdisciplinary teamwork and patient communication skills are essential for safe practice and quality care when administering epidural anesthesia (American Association of Nurse Anesthetist [AANA], 2017). Guay et al. (2016), states there is an under-utilization of educational strategies to improve teamwork and communication in clinical education. The synthesis of the evidence revealed limited available information on simulation use for student anesthetist epidural administration and collaboration. The study conducted by Sittner et al. (2013), evaluates the limited opportunities for students to provide hands-on care to obstetric patients in the clinical setting. The simulation teaching strategy allows students the opportunity to

recreate the clinical environment and fosters improved safety and quality outcomes by patient simulation (Sittner et al., 2013).

Epidural anesthesia is widely used for a variety of procedures and is becoming one of the most requested procedures in labor anesthesia (Lipps et al., 2019). Although epidural blockade provides benefits, some patients voice fears of paralysis and inadequate pain blockade (Pellegrini, 2018). Several risks are associated with epidural blockade; these risks include post-dural puncture headache, infection, paresthesia, high or total spinal anesthesia, and others (Pellegrini, 2018). The interdisciplinary team must work together to ensure the best patient outcome. Simulation is an educational tool that helps prepare the SRNAs for the realities of caring for a laboring patient who is receiving epidural anesthesia (Sittner et al., 2013). This project utilized educational strategies through simulation to improve teamwork, communication, interdisciplinary collaboration, and patient safety.

### Problem Description

Research shows that interprofessional collaboration, teamwork, and communication can enhance patient safety and quality of care (Guay et al., 2016; Raab et al., 2013). Kelly et al. (2016), states that patient safety can be improved, and medical errors reduced with the development and evaluation of interprofessional cooperation education models that reflect evidence-based practice guidelines. Time constraints in the clinical setting limit the SRNA's ability to develop the skills to communicate with interdisciplinary team members, the patient, and the patient's family while simultaneously safely placing an epidural catheter. A collaborative team approach, utilizing simulation to mirror real-life experiences of placing an epidural catheter in an

active laboring patient while communicating with the patient and staff, will equip the SRNA with skills needed to provide effective patient care and improve outcomes in the clinical setting.

### Purpose and Content

This project implemented an active learning simulation for the SRNA to provide skill-based clinical experience and knowledge that will promote safe patient care. Through the simulation experience, the students developed skills that will enhance interprofessional collaboration, cooperation, therapeutic communication, and interdisciplinary teamwork. The high incidence of morbidity and mortality in the United States is a result of medical errors. Healthcare team members can prevent 70% of medical errors, and in the obstetric setting, 10% of sentinel events could be avoided by improved communication (Guay et al., 2016). The use of simulation for teaching and learning in education will increase interprofessional collaboration, improve patient outcomes, patient safety, and satisfaction is through the use of simulation for teaching and learning in education (Sittner et al., 2013). Using evidence-based practice simulation in education promotes increased knowledge, enhanced clinical judgment skills, improved standards of care, and safety measures for students (Sittner et al., 2013).

### The DNP Essentials

The American Association for Colleges of Nursing (AACN) outlined eight educational competencies that provide standards for advanced nursing practice (DNP Essentials Task Force, 2006). Five of the Doctor of Nursing Practice quality essentials are outlined within this doctoral project.

- Essential One: Scientific underpinnings for practice. This project incorporated evidence-based practice guidelines from research utilizing descriptive statistics, quantitative and qualitative analysis, and systematic reviews to implement epidural anesthesia education.
- Essential Two: Organization and Systems leadership for quality improvement and systems thinking. The project utilized an objective simulation clinical evaluation to create a simulation scenario, which improved collaboration, communication, and teamwork for student participants. The techniques encompassed S.M.A.R.T. (specific, measurable, achievable, realistic, timely) objectives, evidence-based interventions, and evaluation methods to prepare the students for real-life clinical practice.
- Essential Three: Clinical scholarship and analytical methods for evidence-based practice. The purpose of the project is to develop practitioners who will provide quality care and patient safety. Provide an avenue through education simulation that allows the student to practice communication skills while performing a procedure and ensuring patient safety.
- Essential Six: Interprofessional collaboration for improving patient and population health outcomes. Develop a practice model that will enable the participants to effectively communicate and collaborate with interdisciplinary partners, patients, and families. Enhance teamwork skills that are essential to improved patient safety and quality outcomes when administering epidural anesthesia.



- Essential Seven: Clinical prevention and health for improving the nation's health. The DNP project utilized evidence-based practice to promote quality care outcomes, reduced adverse events with epidural anesthesia, enhanced clinical judgment skills, improved standards of care, and safe patient care.

#### Available Knowledge

Research by Raab et al. (2013), appraised the importance of interprofessional collaboration on patient safety and positive patient outcomes. This project comprised an active learning simulation for SRNAs to identify and develop teamwork and communication skills in the clinical setting. The SRNA was educated on interdisciplinary team communication while demonstrating proper techniques and procedures used for epidural catheter placement. The project evaluated proper pre and post-assessment procedures and communication between SRNA and BSN regarding patient care. Collaboration on obstetric patient safety and real-life experience through simulation provided enhanced learning for students and positive outcomes for the patient receiving epidural anesthesia. The project addressed interprofessional roles and responsibilities before, during, and post epidural placement.

The synthesis of evidence organized by topic was used for evidence-based guidelines. Information for the project was gathered using the resources found in Cook Library at The University of Southern Mississippi (USM) and the following databases: Medline, EBSCO Host, PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and Google Scholar. Keyword searches were simulation in education, epidural stimulation, epidural anesthesia for patients in active labor collaboration in healthcare, enhanced learning through simulation, labor and delivery

interprofessional communication, obstetric simulation for student learning, SRNA simulation, and inter-collaborative simulation in education. Search years related to study were 2010 to present.

### *Enhanced Learning Through Simulation*

According to Sawhney et al. (2018), incorporating epidural anesthesia simulation with didactic education improves the knowledge and performance of registered nurses' (RNs') care of patients receiving epidural analgesia. The authors suggest that the addition of simulation education yields an improvement compared with traditional lecture-based learning. The study's design included randomized controlled trials, pre- and post-test studies, quantitative studies, and qualitative studies (Sawhney et al. 2018). Simulation education in the hospital setting was used to improve competency, decision making, teamwork, team training, self-efficacy, communication, and new nurse orientation, among other areas (Sawhney et al., 2018).

The study design used a pre and post-intervention epidural knowledge questionnaire, performance checklist, and content review with experienced clinical educators and faculty. The hospital-based simulation combined with didactic education results showed a significant improvement in epidural pharmacology and epidural patient assessment (Sawhney et al., 2018). Overall, the demonstration of procedures performed was improved. Post-intervention, the study stated improved confidence by the RNs in their assessment of a patient receiving epidural analgesia. The study concluded that utilizing simulation education more often in both educational and clinical settings will improve the knowledge and performance of nurses caring for patients receiving epidural anesthesia.

### *Use of Objective Structured Clinical Examinations for Best Practice*

According to Kelly et al. (2016), objective structured clinical examinations (OSCEs) style simulations are frequently used in health care programs for evaluation and preparation for clinical practice. OSCE best practice guidelines (BPGs) were developed to provide an evidence-based guide to enhance educational teaching strategy mastery of skills, feedback, and ongoing formative and summative assessment for students (Kelly et al., 2016). The outcome of this study provided further evidence of the effectiveness of seven OSCE BPGs to revise the development and delivery of simulation.

The study used a mixed-methods approach to assess OSCE best practice guidelines. The OSCE guidelines were to align with the current simulation activity offered to first-year nursing students before their first clinical rotation. The OSCE simulation consisted of seven areas of focus: safe patient care, holistic marking guide, mastery of skills, sequencing and briefing, supportive environment, feedback to guide students' development, and ongoing practice for both formative and summative assessment. The simulation activity was comprised of three parts—rehearsal, Simulation,(SIM), and debriefing. After completing the simulation, students were asked to complete an online survey using the Likert Scale and free-text responses (Kelly et al., 2016). The feedback responses from both the survey and focus groups indicated that OSCE BPGs were applicable and workable for SIMs in guiding student development across the affective, cognitive, and psychomotor domains that are essential in their preparation for practice (Kelly et al., 2016).

### *Clinical Experience Simulation Scenario with Simulator Mother (SIM MOM)*

Sittner et al. (2013) emphasize providing nursing clinical experiences to enhance didactic education received in the classroom. Due to limited clinical experiences afforded in labor in delivery areas, the study indicates educators provide opportunities for students to practice safe patient care for laboring patients. The authors' utilized simulation to enhance the students' clinical experience for labor and delivery. Scenarios were developed which provided real-life physiologic stages and phases of labor. A birthing simulator S550 NOELLE Maternal, Neonatal Birthing Simulator, and CD500 NOELLE Perinatal Monitor were used. The scenario included all phases of labor, patient physiologic changes, patient response to pain, fetal heart pattern changes, and vital sign changes, among other real-world labor and delivery experiences (Sittner et al., 2013).

The results were measured by a five-point Likert scale which evaluated the faculty facilitation of learning, student evaluation of themselves, interventions, and overall satisfaction. Students debriefing allowed remote room observation of the experience, which facilitated discussion of skill improvement, patient safety, and future learning opportunities (Sittner et al., 2013). The research concluded that simulation provides learning opportunities where there are limited clinical experiences and allows for facilitated assistance from instructors to enhance the student learning experience (Sittner et al., 2013).

### *Epidural Analgesia for Labor*

Epidural analgesia is known as the most popular and effective treatment of a laboring mother (Silva & Halpern, 2010). According to Silva and Halpern (2010), the definition of ideal labor analgesia would be a neuraxial block that possesses attributes of

effective pain relief, safe labor progression, and minimal effects on the fetus or newborn. Maternal reactions were nominal and included lower limb motor block, pruritis, and nausea. The authors synthesized information from previous research articles that utilized numerous randomized controlled trials comparing neuraxial analgesia with parenteral opioids and meta-analysis to combine various studies.

The authors' evaluated techniques for safe administration of epidural anesthesia concerning proper patient positioning such as sitting position with maximum knee extension, hip adduction, and leaning forward. Proper identification of epidural space, utilization of aseptic technique to decrease infectious complications, absolute contraindications, side effects, and complications were also measured with random controlled studies and meta-analysis (Silva & Halpern, 2010). The study concluded that neuraxial analgesia is safe and the most effective form of analgesia for allowing the laboring mother to progress in labor without depressing the newborns. Epidural anesthesia allows the use of low concentrations of local anesthetics combined with lipid-soluble opioids for pain management. Innovative drug combinations, delivery systems, and techniques have contributed to meeting the needs of the parturient in a safe and effective manner (Silva & Halpern, 2010).

#### Summary

Labor epidural placement requires a patient-centered continuous approach to care. Lack of communication between healthcare providers can lead to poor patient outcomes. Undergraduate and graduate-level nursing programs can improve patient care by providing educational opportunities designed to intentionally create interactions with students of other disciplines. The incorporation of an educational experience that allows

interdisciplinary collaboration between BSN and nurse anesthesia students will provide excellence for the future of health care. The goal of this project was to assemble students from different disciplines and allow them to function as a team involved in simulated patient care. In clinical practice, both BSN and nurse anesthesia students will interact with active labor patients.

## CHAPTER II - METHODOLOGY

The doctoral project used a mixed-method design, which included descriptive statistics, focus groups, and observations. The project implemented an educational simulation to enhance interprofessional collaboration for SRNAs. The simulation teaching method allowed the SRNA to identify and address knowledge deficits before, during, and after placement of an epidural catheter in a laboring mother. The goal of the project was to increase the SRNA's knowledge on proper procedure, important precautions, pre/post-anesthesia assessment, communication techniques, and monitoring required for proper care of epidural placement in an active labor patient.

### Project Design

#### *Instruments*

The BSN Scenario Planning Worksheet (Appendix A) and Student Scenario Checklist (Appendix B) were created by the BSN faculty and provided to the BSN participants. The Epidural Objective List (Appendix C) and Epidural Checklist (Appendix D) were provided to the SNRA participants. The objective tools created utilized evidence-based S.M.A.R.T guidelines the objectives were specific, measurable, achievable, realistic, and timely. A Likert Scale survey was developed for evaluating the simulation experience. Debriefing and focus group surveys were administered to appraise the quality of the intervention.

#### *Prepare and Execute Simulation*

The evidence-based intervention that was implemented was the preparation and execution of a simulation. The simulation was written by this doctoral project's student investigators and approved by this doctoral project committee chair. The simulation was

created based on the learning objectives. The learning objectives utilized were based on the knowledge, skills, and attitudes assessed and focused on patient-centered care and patient safety.

An objective specific checklist was developed by this doctoral project's student investigators to assess the SRNAs performance based on the learning objectives. The checklist was utilized throughout the simulation learning experience. The simulation sessions were separated into five groups, which included one BSN and one nurse anesthesia student per group. The groups were given a scenario (Appendix A). The BSN participants were evaluated using the Student Scenario Checklist (Appendix B) by BSN faculty. A debriefing survey and focus group survey were created by this project's student investigators.

The project comprised five 15-20-minute collaborative simulation sessions with five BSN and five nurse anesthesia students. The simulation sessions utilized the NOELLE Birthing Simulator and the Simu Epidural task trainer. Each simulation session was recorded by BSN and Nurse Anesthesia Program (NAP) faculty. The simulation equipment was the property of the USM College of Nursing and Health Professions with approval for usage in this project by the program coordinator. This doctoral project simulation was facilitated in the SIM laboratory.

### *Construct Debriefing*

The simulation was videotaped to allow participants to evaluate their performance. The participants were escorted by the doctoral investigator to a debriefing room where they were able to view the recorded simulation and discuss their performance. The debriefing model is in accordance with the National League of Nursing



(NLN) debriefing across the curriculum guidelines (National League of Nursing, 2007). Post-simulation guided reflection questions were provided to each participant. Each group viewed their respective video during debriefing to analyze and summarize key aspects of the simulation experience. The information was then used post-intervention to assemble the qualitative data. The evaluations were combined, and the content analyzed.

#### *Evaluation of the Intervention*

The SRNA participants were evaluated using the Epidural Checklist (Appendix D) by this doctoral project's student investigators. After the simulation, all SRNA participants were provided with a Likert Scale (Appendix G) and were instructed to circle the number that best reflects their opinion for each question from one to five (1- disagree to 5-agree, N/A not applicable). A debriefing session was conducted, each group viewed the recorded video and discussed the findings. The participants were provided with a Debriefing Survey (Appendix E) and Focus Group Questionnaire (Appendix F).

#### *Setting/Sample*

The simulation laboratory serves undergraduate and graduate nursing students at the University. The project was scheduled on a Monday after class to provide SRNAs ample time to complete the simulation, debriefing, and evaluation process. During the simulation sessions, the center coordinator and personnel were available to provide technical support.

The target populations were second-year SRNAs currently enrolled in NUR 842 Advanced Principles of Anesthesia I and BSN students enrolled in NSG 446 Childbearing Families. Exclusions were first-year SRNAs who have not taken NUR 842 (Advanced Principles of Anesthesia I), and third-year SRNA students who were not

currently enrolled in NUR 842. An invitation request that included the date and times of the project was sent via email to second-year SNRAs requesting volunteers to participate in the simulation. Students who agreed to participate were asked not to disclose the name or any personally identifying information on any of the documents that were utilized in this project.

### Summary

An education simulation was conducted to improve collaboration, communication, and teamwork among BSN and nurse anesthesia students. The goal of the project was to increase the SRNA's ability to care for a patient while collaborating with the BSN team members. All students were assessed on the knowledge of the proper procedure, communication techniques, and monitoring required for proper care of epidural placement in an active labor patient. The project presentation included team-specific objectives, team-specific objective focused checklist, simulation session conducted for each group, debriefing session, and a survey tool containing a Likert scale. The appraisal of this investigation are BSN and nurse anesthesia students who demonstrate improved ability to work with members of other disciplines.

## CHAPTER III - RESULTS

Teamwork and collaboration are essential when providing safe, efficient, patient-centered care. The project supports the need for increased OSCE simulation use in the education setting. The participants were evaluated on their skills, knowledge, and proficiencies in performing each task; they likewise evaluated the project. Results gathered from the project serve as insight on skill deficiencies, practical understanding, areas of improvement, and current knowledge base. Outcomes obtained from the project results can be utilized to create comprehensive guidelines in education to improve the simulation experience, process, and enhance students' clinical skills.

### BSN Checklist Results

Five BSN students were paired with five SRNA students. A total of 10 students were put into groups of 2 to form 5 groups. Prior to the simulation, students were given a brief explanation of their expectations and the purpose of the simulation. The students were evaluated by their instructor who provided the objective checklist for the simulation (Appendix A). Half of the participants were fourth semester BSN students (n=5), and half of the participants were second-year SRNA students (n=5). The BSN students were first evaluated on introducing themselves to patients and families. All the students failed to meet this requirement. Students were then required to identify the patient by confirming the patient's correct name, date of birth, and allergies. All the BSN students met this requirement.

BSN students were expected to provide information to the SRNA before epidural placement concerning the consent form being signed, administer a one-liter preload of intravenous fluids (IVFs), and check the patient's platelet count. Sixty percent of the

students (n=3) verified the consent form being signed, and 40% (n=2) did not verify the patient signing the consent form. Forty percent of the students (n=2) administered one liter of preload IVF to the patient while 60% failed to administer preload IVF. Sixty percent of BSN students (n=3) provided the patient's platelet count before the epidural, and 40% (n=2) failed to offer the patient's platelet count.

Prior to the procedure, the BSN students were evaluated on participating in a time out. Sixty percent of the students (n=3) met the requirement, 20% failed to meet the requirement, and 20% (n=1) were not evaluated for participating in a time-out. BSN students were evaluated on their assistance with positioning and coaching the patient during the epidural procedure. Eighty percent of the students (n=4) met this requirement while 20% (n=1) did not (see Appendix B).

#### BSN Simulation Evaluation Results

After the simulation laboratory, each BSN student was given the opportunity to evaluate the simulation laboratory using the Likert Scale (Appendix G). They were instructed to circle the number that best reflects their opinion for each question from one to five (1- disagree to 5-agree, N/A not applicable). The Likert scale consisted of the following questions to evaluate the experience:

- Will improve their performance in clinical settings. All rated this question with a five (agree). One student added a comment stating, "Helped with communication."
- Will help improve their critical thinking skills. Eighty percent (n=4) of the BSN students rated the question as a five (agree), and twenty percent (n=1) rated the question as a four.

- Was realistic. Sixty percent (n=3) rated this question as a five and 40% (n=2) rated this question as a four. The student that rated the question as a four left an additional comment stating, “May need more of a real patient.”
- Allowed them to practice their nursing skills. Eighty percent (n=4) of the students rated this question as a five and 20% (n=1) rated this question as a four.
- Supported the course objectives. All students (n=5) rated this question as a five.
- It was a valuable learning experience. All students (n=5) students rated this question as a five. One student left an additional comment stated, “Really enjoyed!”

At the end of the evaluation, students were allowed to leave additional comments concerning their experience during the simulation. Twenty percent of students (n=1) left a statement saying, “I wasn’t really sure what I was supposed to be doing.”

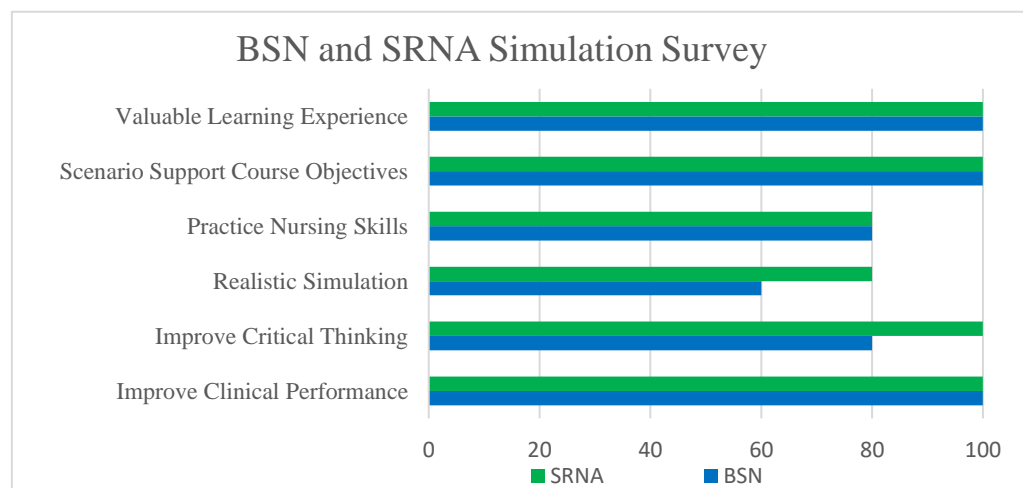


Figure 1. BSN and SRNA Simulation Survey.

## NAP Students Epidural Checklist Results

During the simulation, NAP students were evaluated by their instructor on objectives that were to be met to successfully manage a patient who is in active labor and wishes to receive an epidural for pain management (Appendix C). The students received a checkmark under “met” if they adhered to the objective or a “not met” if the student did not meet the requirement (Appendix D). An epidural checklist was utilized to assess the students’ performance, the guidelines employed for evaluation are as follows:

- Pre-assessment I, SRNAs participants were evaluated on whether they verified the patient, the medical patient’s history, anesthesia history, allergies, and a physical assessment. All (n=5) of the SRNAs met the requirement.
- Pre-assessment II assessed if the SRNAs confirmed functional peripheral IV and laboratory testing values for the patient’s current platelet count. Forty percent (n=2) of the students received a check for both confirming a functional IV and platelet count. Sixty percent (n=3) of the students received “met” for only platelet count confirmation and a “not met” for peripheral IV confirmation.
- Pre-assessment III involved students assessing the laboring patient’s vital signs and fetal heart rate. All students (n=5) received a “met.”
- The informed consent assessed if the SRNA briefly discussed the procedure, the risks, benefits, and answered any questions before obtaining consent from the patient. Eighty percent (n=4) of students met all the requirements. Twenty percent (n=1) discussed the procedure, risks, benefits, and answered questions but did not obtain informed consent.

- Positioning and landmark objective assessed if the students could properly identify anatomical structures to properly place an epidural. SRNAs were evaluated on positioning the patient securely on the bed, identifying anatomical landmarks lumbar four to lumbar five (L4-L5), and whether they properly communicated with the patient and the nurse for assistance. All SRNAs (n=5) received a “met.”
- The time-out objective assessed the SRNAs capability to communicate with the staff for preprocedural verification. Eighty percent of students (n=4) met the requirement, and 20% of the students (n=1) did not meet the requirement.
- SRNAs were evaluated on an aseptic technique. Students are required to don surgical hair cover, face mask, wash hands, don gloves, maintain sterility when opening gloves, set up kit, and properly prep patients. All students (n=5) received a “met.”
- For the epidural procedure objectives, SRNAs were checked off on choosing the proper site for placement, appropriate dose of lidocaine (1%, 1-2 ml), communicating with the patient about the process, and inserting the epidural needle with the stylet. All of the students (n=5) received a “met.”
- SRNAs are expected to find the epidural space, evaluated on removing the stylet, attaching the glass syringe with 2 ml of saline and 1 ml of air, and controlling the needle with steady and slow advance until loss of resistance. All of the students (n=5) received a “met.”

- Catheter insertion objective evaluates the SRNAs ability to thread the catheter into place 3 cm to 5 cm or 7 cm for obese patients. All students (n=5) received a “met.”
- SRNAs were expected to administer a test dose of 3 ml of 1.5% lidocaine with 1:200,000 epinephrine. All of the students (n=5) received a “met.”
- SRNAs should communicate the signs and symptoms of intravascular injection with the patient and request the patient to express if they experience any signs and symptoms. Sixty percent of the students (n=3) received a “met,” and 40% (n=2) received a “not met.”
- The loading dose objective necessitates SRNAs to aspirate and administer a bolus of 5 ml of 0.5% Bupivacaine in increments and connect to the epidural pump. Eighty percent (n=4) received a “met,” and 20% (n=1) received a “not met.”
- SRNAs were assessed on measuring the patient’s block-level and documentation of the procedure. All students (n=5) received a “met.”

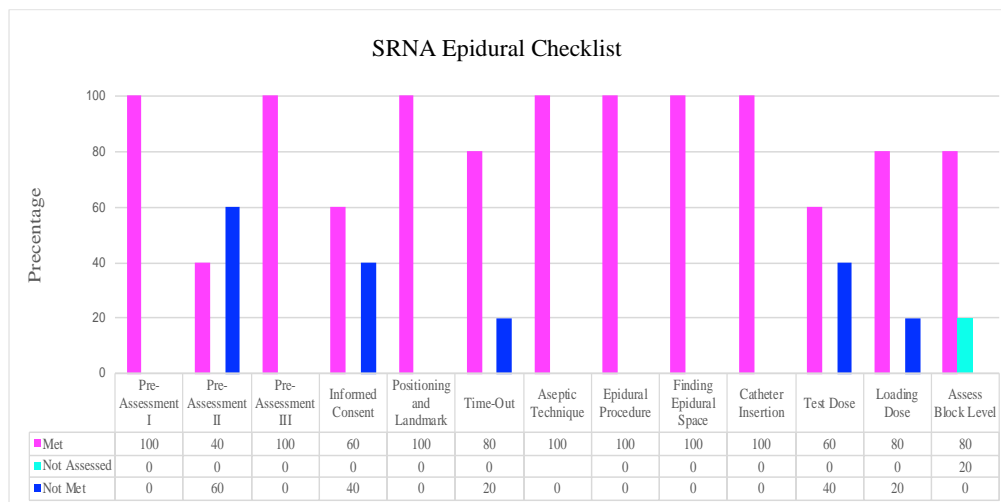


Figure 2. SRNA Epidural Checklist Results



## The Debriefing/Focus Group Survey Results

The Debriefing and Focus Group Surveys were used to analyze the results of the simulation (Appendix E and F). When discussing communication skills learned through the simulation experience, 80% (n=4) of the BSN participants and 80% (n=4) of the SRNAs stated they learned to communicate effectively with the patient and students throughout the process. Communication with the nurse and how to properly talk a patient through an epidural procedure was stated as improved by 40% (n=2) of SRNA participants. The SRNA participants discussed how having clear objectives improved the ability to communicate with the BSN participant and focus less on technical skills. The BSN participants stated they lacked objectives specific to their roles and expectations which led to confusion during the simulation. All of the BSN and SRNA participants conveyed the ability to communicate with other team members, verbalize the procedure to the patient, and successfully place the epidural catheter were improved due to the simulation experience.

When focusing on teamwork modalities and working through the simulation, 80% (n=4) of SRNA and 100% (n=5) of BSN participants stated satisfaction. The participants overall stated that they learned to perform better as a team and collaborate with partners. When discussing key assessments and interventions, 60% (n=3) of the SRNAs stated communication with team members and communicating with the patient. Both groups of participants discussed how the process such as the time out, communicating with the nurse and patient, and focusing on the task were improved by the learning experience. The BSN participants 60% (n=3) stated that improved knowledge and skills were needed to better assist with the procedure. Of the SRNA participants, 40% (n=2) stated

improvement in “assessing the patients’ symptoms if any and correct placement of the patient position” and “assessing spine, patients’ vitals, pain level, interventions, epidural, and calm talking to the patient.”

The BSN participants comments included being more confident during the exercise (20%, n=1), being better prepared and applying more nursing knowledge (20%, n=1), needing a pre-simulation handout/objectives (20%, n=1), communicating with the patient more throughout the process (20%, n=1), and having an actual person acting the part of the patient (40%, n=2). The consensus of the SRNA participants for how they would handle the situation differently included communicating with the nurse before the procedure (40%, n=2), checking lab values (20%, n=1), doing a time out (40%, n=2), and having more time to prepare (20%, n=1).

Collaboration and handling the situation as a team was stated by 100% (n=5) BSN and 80% (n=4) SRNA participants. “I felt like a real nurse in this realistic situation”, was expressed by one BSN participant. Although feeling uncomfortable, underprepared for the simulation, confused, and nervous was stated by 40% (n=2) BSN and 20% (n=1) SRNA participants. The aspect of therapeutic communication with the patient was communicated by both groups as a need for improvement.

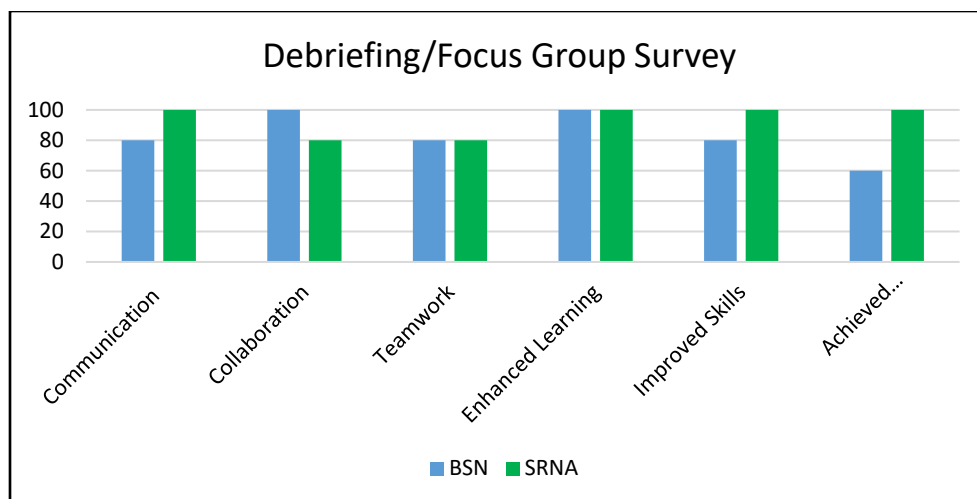


Figure 3. Debriefing/Focus Group Survey Results.

### Summary

According to the surveys, the BSN and SRNA participants both emphasized enhanced learning, communication, and teamwork. During the simulation experience, the participants performed well in verifying the patient's identification, medical history, anesthesia history, allergies, physical assessment, assessing the laboring patient's vital signs, and fetal heart rate. The participants briefly discussed with the patient the procedure, risks, benefits, and answered any questions before obtaining consent from the patient. The metrics utilized to evaluate the overall collaboration results revolved around enhanced teamwork. The goals included working together to identify anatomical structures, team discussion to properly place the epidural, each member utilizes aseptic technique, execute epidural catheter placement, and correct documentation. Deficiencies in each participant involved the process of initiating a timeout prior to the epidural procedure. Additional knowledge is needed for all participants when addressing what signs and symptoms of intravascular local anesthetic injection to communicate to patients.

## CHAPTER IV – CONCLUSION

Managing patient care can be challenging for certified registered nurse anesthetists and labor and delivery nurses when providing epidural anesthesia for pain control. Epidural anesthesia is widely used for a variety of procedures and is becoming one of the most requested procedures in labor anesthesia (Lipps et al., 2019). The purpose of this project was to enhance the learning of BSN students and SRNAs collaborating through the use of simulation education. This project examined the effect of communication and collaboration between interdisciplinary team members. The BSN students and SRNAs were provided a simulation environment to care for a laboring patient while improving patient safety and quality outcomes.

The results suggest that all of the participating students thought the stimulation was beneficial in improving their clinical performance in the clinical setting and was a valuable learning experience. The participants reported that the simulation was realistic, instrumental in improving their critical thinking skills, and allowed them to practice their nursing skills. The consensus among all of the BSN students and SRNAs was the simulation experience allowed them to gain skills and would be valuable for future students.

### Limitations

Although the BSN program has access to high fidelity Sim MOM, the participants indicated that they were not properly trained in caring for patients who are in active labor opting to have an epidural. The SRNAs suggested the focus was on the procedure rather than collaboration during the simulation experience. The participants suggest that although they learned to communicate and collaborate during the simulation, the

instructions before and during the simulation were not clear. According to the BSN participants, the use of a list of objectives would have been beneficial to prepare for the simulation.

The BSN participants' list of objectives was broad and consisted of three learning objectives (See Appendix A). The SRNAs list of objectives was created using S.M.A.R.T. goals; the objectives were specific, measurable, achievable, realistic, and timely (Appendix C). The S.M.A.R.T. goals utilized in the SRNA objectives, which created clear expectations of the outcomes. The BSN objective list lacked S.M.A.R.T. goals. Three BSN students reviewed the SRNA objectives before the simulation; these individuals noted that it helped during the simulation.

The BSN participants stated during the debriefing or on focus group survey that the use of specific objectives or guidelines, which outlined expectations for the registered nurses, would have assisted in navigating the simulation. The difference between the BSN and SRNA participants concerning the overall benefit of the simulation experience is expressed in Figure 4. The results indicate that the overall benefit of the simulation experience reported by both groups, the BSN 83%, and SRNA 93%. The major difference shown was based on the BSN participants' survey responses that a list of specific objectives would be necessary to successfully complete the study.

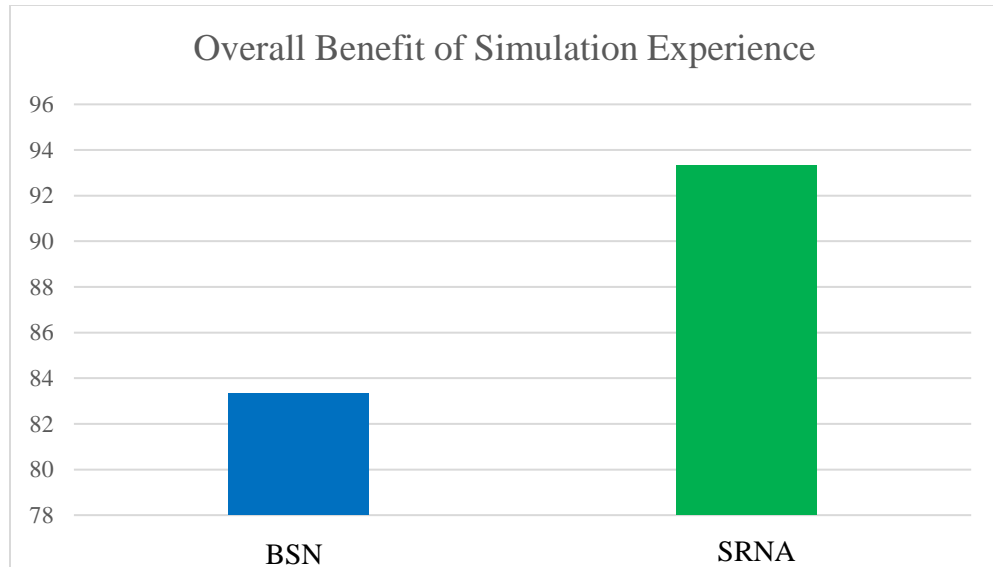


Figure 4. Overall Benefit of Simulation Experience. Finalized mean results.

#### Future Implication for Improvement

For future studies, all participants should receive a list of objectives prior to the simulation. The objectives must incorporate the S.M.A.R.T. goals and be specific to the objective checklist for the simulation to accurately assess student learning and performance. Proper training and knowledge are essential for the registered nurse and anesthesia provider caring for laboring patients. Students should understand the importance of fetal and maternal assessment, administration of IVFs, the effects of epidural anesthesia, and the cognitive skills needed to deliver safe care to the patient. Collaboration and communication between faculty and researchers should be ongoing to provide the best outcome and efficiency for future studies. To determine the accuracy of survey results there should be statistical use of quantitative measures. A larger focus group could be used to provide more variability in the results.

APPENDIX A – Scenario Planning Worksheet

Scenario	Epidural Placement
Estimated Scenario Time	10-15 minutes
Estimated Debriefing Time	25 minutes
<p>Prerequisite Knowledge</p> <p>Learners should possess the following competencies prior to participation in this scenario</p>	
<p>Patient vs assessment and physical assessment</p> <p>Care of the laboring client receiving epidural anesthesia</p> <p>Normal fetal heart rate</p>	
Cognitive Skills	Psychomotor Skills
<p>Knowledge of normal pregnancy-physiology</p> <p>Knowledge of epidural anesthesia and its effects and adverse effects</p>	<p>Vital sign assessment</p> <p>Fetal heart rate assessment</p> <p>Administration of intravenous fluids</p> <p>Insertion of indwelling Foley catheter</p>
Brief Summary	
<p>Jessica Parkland, 30 years old, Gravida 4 Para 2 at 37 weeks' gestation, has been laboring for 14 hours. The cervical assessment is 6 cm. She has no known allergies. His obstetric history includes one spontaneous abortion two years ago. Her medical history is unremarkable. For her current pregnancy, Ms. Parkland is diagnosed with gestational diabetes, diet controlled. Current VS: blood pressure (BP) 128/78, heart rate (HR) 72, respiratory rate (RR) 24, temperature (T) 99.0 Fahrenheit (F); continuous</p>	

electronic fetal movement is in progress. Ms. Parkland is being coached by her partner to breathe through her contractions. She is requesting to receive an epidural for labor pain management.

Learning Objectives

1. Provide care to the laboring patient receiving an epidural for pain management
2. Understand the risk, side effects, and adverse effects of epidural anesthesia
3. Provide appropriate nursing care in the management of an adverse effect on the client receiving epidural anesthesia.



APPENDIX B – Bachelor of Science in Nursing Student Scenario Planning Checklist

	YES	NO
Introduces self to patient and family		
Identifies patient (correct name, date of birth, allergies)		
Correctly manages an adverse event:		
1. Recognizes a deviation from normal vital signs		
2. Recognizes a deviation from normal fetal heart rate		
Provides the following information to the student nurse anesthetist prior to epidural placement:		
1. Consent forms signed		
2. Preload of 1liter of Intravenous fluid administered		
3. Platelet count		
Time-Out performed		
Assist with coaching and positioning of the patient		

APPENDIX C – Epidural Objective List

Pre-Assessment I	Verify patient, review patient’s history and physical, anesthesia history, and allergies.	
Pre -Assessment II	Confirm functional peripheral Intravenous catheter, laboratory result, and platelet count.	
Pre-Assessment III	Maternal vital signs and fetal heart rate.	
Informed Consent	Discuss briefly the procedure, risks, and benefits. Answered all questions to obtain informed consent.	
Positioning and Landmark	Position patient securely on a bed, identify anatomical landmarks Lumbar 4-5, Communicate with nurse and patient for assistance.	
Time-out	Communicate with staff for preprocedural verification.	
Aseptic Technique	Don surgical hair cover, face mask, and wash hands. Maintain sterility open gloves, kit set-up, and prepping patient.	
Epidural Procedure	Choose the site. Local anesthetic at the site (Lidocaine 1%, 1-2 ml). Communicate with the patient.	
	Insert the epidural needle (17-19 gauge with stylet).	
Find Epidural Space	Remove stylet, attach glass syringe with 2 ml saline, and 1ml air. Control the needle with steady and slow advance until loss of resistance.	
Catheter Insertion	Thread catheter into place (3-5 cm or 7cm for obese patients).	
Test Dose	Administer test dose 3 ml of 1.5% lidocaine with 1:200,000 epinephrine.	
	Communicate with the patient to identify if the patient experience signs and symptoms of intravascular injection.	
Loading Dose	Aspirate, bolus (Bupivacaine 0.5% 5 ml incremental). Ready to connect Epidural pump.	
Assess Block level	Assess for block-level and document the procedure.	

APPENDIX D – Epidural Checklist

		Met	Not Met	Comment
Pre-Assessment I	Verify patient, review patient’s history and physical, anesthesia history, and allergies.			
Pre -Assessment II	Confirm functional peripheral IV, and labs (platelet count).			
Pre-Assessment III	Maternal vital signs and fetal heart rate.			
Informed Consent	Discuss briefly the procedure, risks, and benefits. Answered all questions to obtain informed consent.			
Positioning and Landmark	Position patient securely on a bed, identify anatomical landmarks L4-5, Communicate with nurse, and patient for assistance.			
Time-out	Communicate with staff for preprocedural verification.			
Aseptic Technique	Don surgical hair cover, face mask, and wash hands. Maintain sterility open gloves, kit set-up, and prepping patient.			
Epidural Procedure	Choose the site. Local anesthetic at a site (Lidocaine 1%, 1-2 ml). Communicate with the patient.			
	Insert the epidural needle (17-19 gauge with stylet).			
Find Epidural Space	Remove stylet, attach glass syringe with 2 ml saline, and 1ml air. Control the needle with steady and slow advance until loss of resistance.			
Catheter Insertion	Thread catheter into place (3-5 cm or 7 cm for obese patients).			
Test Dose	Administer test dose 3 ml of 1.5% lidocaine with 1:200,000 epinephrine.			
	Communicate with the patient to identify if the patient experience signs and symptoms of intravascular injection.			
Loading Dose	Aspirate, bolus (Bupivacaine 0.5% 5 ml incremental). Ready to connect Epidural pump.			
Assess Block level	Assess for block-level and document the procedure.			

(Nathan & Wong, 2019; “Spinal, Epidural, & Caudal Blocks,” 2018)

## APPENDIX E – Debriefing Model

### Using Collaborative Objective Simulation Clinical Evaluation with Undergraduate Nursing Students and Nurse Anesthesia Students for Labor Epidural Placement in an Active Labor Patient

#### Debriefing Model

1. Do you consent to this study?
2. Describe the learning objectives you were able to achieve.
3. Which learning objectives were you unable to achieve, if any?
4. Did you have the knowledge and skills necessary to meet the learning objectives?
5. Were you satisfied with your ability to work through the simulation learning experience?
6. If you were able to participate in this learning simulation experience again, how would you approach the situation differently?

(National League for Nursing, 2007)

## APPENDIX F - Focus Group Questionnaire

### Using Collaborative Objective Simulation Clinical Evaluation with Undergraduate Nursing Students and Nurse Anesthesia Students for Labor Epidural Placement in an Active Labor Patient

1. Do you want to consent to this study?
2. How did you feel through the simulation experience?
3. What did the group do well?
4. Could any aspect of the simulation differently?
5. How do you feel the health care team handled the situation?
6. Is there anything else you would like to discuss?

(National League for Nursing, 2007)

APPENDIX G – Likert Scale



Using Collaborative Objective Simulation Clinical Evaluation with Undergraduate Nursing Students and Nurse Anesthesia Students for Labor Epidural Placement in an Active Labor Patient Simulation Survey

Do you consent to this study?                      Yes    No

Circle the number that best reflects your opinion of each statement below.

Circle N/A if the statement is not applicable to your simulation experience.

	<b>Disagree</b> <b>Agree</b>	<b>Comments</b>
The simulation experience will improve my performance in the clinical setting.	N/A   1   2   3 4   5	
The simulation experience will help improve my critical thinking skills.	N/A   1   2   3 4   5	
The simulation experience was realistic.	N/A   1   2   3 4   5	
The simulation experience allowed me to practice my nursing skills.	N/A   1   2   3 4   5	
The simulation scenario supports the course objectives.	N/A   1   2   3 4   5	
This simulation was a valuable learning experience.	N/A   1   2   3 4   5	

## APPENDIX H – IRB Approval Letter

Office of  
Research Integrity



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### NOTICE OF INSTITUTIONAL REVIEW BOARD ACTION

The project below has been reviewed by The University of Southern Mississippi Institutional Review Board in accordance with Federal Drug Administration regulations (21 CFR 26, 111), Department of Health and Human Services regulations (45 CFR Part 46), and University Policy to ensure:

- The risks to subjects are minimized and reasonable in relation to the anticipated benefits.
- The selection of subjects is equitable.
- Informed consent is adequate and appropriately documented.
- Where appropriate, the research plan makes adequate provisions for monitoring the data collected to ensure the safety of the subjects.
- Where appropriate, there are adequate provisions to protect the privacy of subjects and to maintain the confidentiality of all data.
- Appropriate additional safeguards have been included to protect vulnerable subjects.
- Any unanticipated, serious, or continuing problems encountered involving risks to subjects must be reported immediately. Problems should be reported to ORI via the Incident template on Cayuse IRB.
- The period of approval is twelve months. An application for renewal must be submitted for projects exceeding twelve months.

PROTOCOL NUMBER: IRB-19-258

PROJECT TITLE: Using Collaborative Objective Simulation Clinical Evaluation with Undergraduate Nursing Students and Nurse Anesthesia Students for Labor Epidural Placement in an Active Labor Patient

SCHOOL/PROGRAM: Leadership & Advanced Nursing

RESEARCHER(S): Michong Rayborn, Nina McClain

IRB COMMITTEE ACTION: Approved

CATEGORY: Expedited

6. Collection of data from voice, video, digital, or image recordings made for research purposes.
7. Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

PERIOD OF APPROVAL: June 28, 2019 to June 27, 2020

A handwritten signature in cursive script that reads "Donald Sacco".

Donald Sacco, Ph.D.  
Institutional Review Board Chairperson

APPENDIX I – Literature Review Matrix

	<b>Purpose</b>	<b>Findings</b>
American Association of Nurse Anesthesia (2017)	Policy consideration for registered nurses (RNs) who are qualified through education, credentialing, and ongoing competency assessment to manage, monitor, and care for laboring and non-laboring patients receiving analgesia through various catheter techniques.	RNs are an integral member of the pain management team who facilitates patient care, education and collaborate with all healthcare team members to provide optimal healthcare to the patient.
Bos et al. (2017)	Epidural analgesia remains a widely used analgesic technique. This article aims to assess the safety of epidural analgesia by balancing efficacy and complications, of epidural analgesia for acute, labor, and chronic pain.	The study outcome showed that epidural analgesia for obstetric analgesic is tolerated in young, healthy women, and problems leading to permanent neurological damage rarely happens. The safety of epidural analgesia for perioperative and chronic pain treatment is more difficult to balance. Therefore, a careful selection of suitable patients cannot be over-emphasized.
Guay et al. (2016)	The importance of this article is to express the importance of interprofessional education (IPE) and to determine student readiness for continued IPE after engaging in an obstetric simulation.	The outcome revealed that students were very positive about IPE even before the simulation. Students who did not initially view IPE favorably had a significant increase in readiness for IPE after the simulation experience.
Kelly et al. (2016)	This study was to assess OSCE best practice guidelines and if it aligned with their current simulation activity offered to first-year nursing	The outcome of this study provided evidence of the effectiveness of the seven BPGs. The feedback responses from both the survey and focus groups



	<p>students before their first clinical rotation by using a mixed-method approach. The OSCE BPG simulation consisted of seven areas of focus: Safe patient care, holistic marking guide, mastery of skills, sequencing and briefing, supportive environment, feedback to guide students' development, and ongoing practice for both formative and summative assessment.</p>	<p>indicated that BPGs were applicable and workable for SIMs in guiding the students' development across the affective, cognitive and psychomotor domains that are essential in their preparation for practice.</p>
<p>Lipps et al. (2019)</p>	<p>This study focuses on if the timing of initiation of neuraxial labor analgesia patients. The author was concerned if the obstetricians, anesthesiologists, and nurses had a varying influence on decision-making for epidural placement. The author hypothesized that provider groups would have similar attitudes toward the timing of epidural placement, but some identifiable differences could be used to improve understanding and communication among providers.</p>	<p>The results proved that there was a difference between providers in factors that may impact the timing of epidural placement and in their self-perceived familiarity with epidural management. These present an opportunity for furthering interprofessional education and collaboration.</p>
<p>Pellegrini (2018)</p>	<p>The chapter in Nagelhout &amp; Elisha (2018), provides evidence-based practice guidelines for regional spinal and epidural anesthesia. Guidelines are provided for the techniques, anatomy, physiology, complications, and management of regional</p>	<p>The text provides the guidelines for anesthesia providers to understand how to administer and manage neuraxial anesthesia. This technique allows for perioperative pain management and comfort for patients.</p>

	anesthesia in modern anesthesia practice.	
Raab et al. (2013)	The purpose of this study was to analyze how three different institutions implemented various tools to investigate if collaborative processes improved patient safety, providers' satisfaction, and established positive outcomes.	The study shows interprofessional collaboration in the clinical arena leads to better clinical outcomes for patients and increased job satisfaction for staff. The researcher suggests that an objective review of the safety culture survey results, patient satisfaction scores, staff satisfaction scores, and adverse outcomes data could provide a measurement of the impact of interprofessional collaboration on patient safety and staff satisfaction.
Sawhney et al. (2018)	The purpose of this study was to enhance education regarding epidural analgesia for registered nurses by incorporating epidural anesthesia simulation with didactic education improves knowledge and performance of RNs' care of patients receiving epidural analgesia.	The outcomes in the study showed a significant improvement in epidural pharmacology, epidural patient assessment, and improvement in the demonstration of procedures.
Silva & Halpern (2010)	This article focuses on goals of pain relief, methods to attaining ideal labor analgesia, and effective quality of pain relief. The author discusses various local anesthetics, safety, risks, effects on progress or outcomes on the fetus, newborn, and mother.	In summary, neuraxial analgesia is safe and the most effective form of analgesia for allowing the laboring mother to progress in labor without depressing the newborn. Innovative drug combinations, delivery systems, and techniques have contributed to meeting the

		needs of most parturient in a safe and effective manner.
Sittner et al. (2013)	This study emphasized providing nursing clinical experiences to enhance didactic education received in the classroom. Due to limitations of clinical experiences in the labor and delivery area, the study suggests that educators provide opportunities for the student to practice safe patient care by utilizing simulation to enrich the students' clinical experience for labor and delivery.	The results were measured by a five-point Likert scale which evaluated the faculty facilitation of learning, student evaluation of themselves, interventions, and overall satisfaction. The research concludes that simulation provides learning opportunities where there are limited clinical experiences and allows for facilitated assistance from instructors to enhance the student learning experience.

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