A STEM grant was awarded by the US Department of Education to assist in the recruitment and retention of multicultural and economically disadvantage students. Revenue from this grant was utilized to design, implement, and evaluate an evidenced-based practice nursing simulation project in an undergraduate maternal newborn nursing course. An evidence review confirmed the utility and effectiveness of simulation in nursing education (Adamson, 2015; Berndt et al., 2015; Hafaza & Brysiewicz, 2017; Miller, 2014). A systematic review of one hundred and fifty-three studies validated NLN/Jeffries Simulation Framework Variables as a valuable tool to guide and support simulation (Adamson, 2015). This framework was used to underpin the simulation project design. Simulation facilitated the demonstration of the understanding of nursing knowledge and skills obtained through instruction, critical thinking, clinical judgment, problem-solving, and clinical decision-making in a safe non-threatening environment (Hafaza & Brysiewicz, 2017). Simulation has been reported to increase cognitive knowledge, self-confidence and has the potential to have a positive effect on maternal-infant outcomes (Miller, 2014). Several studies have reported the impact of simulation included positive responses for nursing student satisfaction, self-confidence, and increase in cognitive knowledge (Adamson, 2015; Berndt et al., 2015; Bortolato-Major et al., 2018; Hafaza & Brysiewicz, 2017; Macauley et al., 2017; Miller, 2014). The purpose of this project was to facilitate student centered learning through active engagement in a simulated clinical environment. The twenty-six students enrolled in the course were from multiracial, ethnic, and cultural backgrounds. Four simulation modules and case scenarios were designed and utilized to guide 26 students through the simulations. Jeffries five design characteristics (Miller, 2014) were employed. The simulation modules and scenarios were developed according to course objectives and learning outcomes. The students were assigned pre-simulation work to help them prepare for each simulation. The simulated maternity unit was utilized to make the environment realistic, learning activities ranged from the simple to complex and cues were utilized by the faculty when necessary. Pre-brief and debriefing sessions were utilized for reflective learning. Three project outcomes were identified to determine the effectiveness of the simulation on student satisfaction and learning. The first outcome was that 80% of the students surveyed would report the modules substantially helped with learning and improved maternal newborn clinical skills. The second outcome was that there would be a ten percent increase in the standardized Maternity Specialty Exam Scores when compared to a cohort of thirty seven students who completed the same course with no simulation during the previous spring semester. The third outcome was that the students in the cohort who completed simulation would have a ten percentage increase in “A” course grade when compared to the cohort who did not complete simulation. At the end of the simulations the survey results showed 96.15% of the twenty-six students who participated in simulation reported they experienced substantial knowledge gains and improved clinical skills as a result of completing the modules and participating in the simulation scenarios. Their standardized test scores were eighty-four percent or higher. Fifty percent of them obtained “A” course grades. The cohort of thirty-seven students enrolled in the previous semester without simulation activity scored seventy-eight percent or higher on the standardized test. Forty- three percent of them achieved a course grade of “A.” Although only the first outcome was met, student centered learning through active engagement in a simulated clinical environment was achieved. Nurse educators and nursing schools must continue to utilize simulation as a learning tool to promote active learning and problem solving. The revenue from available grants to fund nursing education and nursing education research deserves consideration.
**Keywords:**
Clinical decision-making, Outcomes and Simulation

**References:**


**Abstract Summary:**
Nursing education strategies must be dynamic in response to students needs. The utilization of the best available evidence to inform nursing education is paramount. An evidence-based simulation project demonstrated positive student satisfaction and student centered learning through active engagement in a simulated clinical environment.

**Content Outline:**
The Impact of Evidence-based Simulation Modules in an Undergraduate Maternal Newborn Course

The complex needs of nursing students and an increasingly more diverse student population necessitates the exploration of innovative ways to promote student learning and successful completion of the undergraduate nursing program. Nursing schools are pushed to explore other avenues for revenue to increase the funding available for diverse student populations. The use of simulation as a teaching and learning tool to promote knowledge acquisition, clinical skills, and decision-making is well documented.
Simulation facilitates the demonstration of the understanding of nursing knowledge and skills obtained through instruction, critical thinking, clinical judgment, problem-solving, and clinical decision-making in a safe non-threatening environment (Macauley et al., 2017). The US Department of Education awarded a STEM grant to support, direct, and retain diverse student populations at a university. Part of the revenue from this grant was utilized to develop, implement, and evaluate an evidenced-based practice nursing simulation project in an undergraduate maternal newborn nursing course.

**Evidence Review**

A systematic review supported the use of simulation as a learning tool to transfer knowledge and skills to undergraduate nursing students (Macauley et al., 2017). Several studies have reported the impact of simulation included positive responses for nursing student satisfaction, critical and reflective learning, self-confidence, and increase in cognitive knowledge (Adamson, 2015; Berndt et al., 2015; Bortolato-Major et al., 2018; Hafaza & Brysiewicz, 2017; Kapucu, 2017; Macauley et al., 2017; Miller, 2014). Effective simulation requires the identification of the type of simulation, the purpose of the simulation, the preparation of the students, the alignment of learning objectives, learning outcomes, with realistic scenarios, and the support of the learners (Miller, 2014).

Educators conducting simulation must have the expertise and the knowledge base to plan scenarios aligned to the level of students’ knowledge and skills (Miller, 2014). A systematic review showed that simulation experience has a positive impact on the students enrolled in health professions. They demonstrated improved clinical decision making, critical thinking, and clinical reasoning (Macauley et al., 2017). Miller (2014) articulated that according to NLN/Jeffries Simulation Framework, five design characteristics were required for an effective simulation design. They were identified as clearly written objectives specific to what the learner was expected to learn. Another design characteristic was the creation of scenarios and simulation environment grounded in realism. In addition, the scenarios should reflect complexity, cues for student support, and debriefing sessions for reflective learning. Miller (2014) went on to stress that clear guidelines should be given to students for preparation, participation, and debriefing for the simulation exercise to be beneficial.

**Maternal Newborn Simulation Design**

The evidence was employed to design the simulation. The two members of the faculty who were selected to design the modules with the simulation scenarios had more than five years experience in maternal newborn nursing and nursing education. They also completed training in simulation teaching strategies and routinely facilitated simulation for more than three years. The faculty members were compensated with a stipend of two thousand, five hundred dollars each.

Faculty created a blue print for the simulation by adhering to NLN/Jeffries Simulation Framework, five design characteristics. A student version and a faculty version of the modules were designed. The simulation modules were aligned to the course objectives, the course learning outcomes, and the NCLEX-Test Plan. The selected faculty members collaboratively worked to design, implement, and evaluate the project.

Four learning modules were created to guide four simulations in the simulation lab. Students were provided with detailed clearly written and verbal instructions to prepare for each scenario. Expectations for participation were clearly outlined. The modules were posted on blackboard at the beginning of the semester three weeks prior to the scheduled simulation event. In order to meet the design characteristic of realism, the simulation environment mirrored a maternal newborn unit and realistic clinical scenarios were used. Those scenarios allowed for dealing with simple to complex problem solving and clinical decision-making.

On the day of each simulation students were assigned their practice roles. The roles were primary nurse, charge nurse, unlicensed assistive personnel (UAP), and family member. Roles were rotated among the
students and no student played the same role more than once. The faculty played the role of the health care provider or the allied health professional. The students were supported and provided with context clues based on the complexity of the identified nursing problems. One hour long debriefing sessions allowed students to reflect on their actions, behaviors, and feelings. It also facilitated reflective learning. Three project outcomes were identified to determine the effectiveness of the simulation on student satisfaction and learning.

**Project Outcomes**

1. Eighty percent of the students surveyed would report the learning module substantially helped with learning gains and improved skills for this course.
2. A ten percent increase in the student standardized test scores when compared to a cohort of students previously enrolled in the same course with no simulation.
3. The students in the cohort who completed simulation would have a ten percentage increase in grade A at the end of the course when compared to the students who did not complete simulation.

The title, purpose, objectives, and learning outcomes for each module were utilized to guide the simulation activity as outlined in the following:

**Simulation Title:**

Holistic Nursing: Simulations of the Childbearing Family Experience

**Classes in which Learning Modules were Implemented:**

NURS 3553: Holistic Nursing: Care of the Childbearing Family

**Semester Implemented:**

Spring, 2018

**Description of each learning module:**

**Simulation #1 Well Woman and Antepartum Care**

Description: The purpose of this module was to simulate a routine well woman visit, to complete the appropriate procedures, and respond appropriately to variations in client needs.

Course Objectives:

- Demonstrate therapeutic communication skills with patients and families.
- Utilize clinical reasoning to provide a safe and therapeutic care environment for patients and families.
- Demonstrate a beginning proficiency in psychomotor skills.
- Deliver care in an organized, efficient manner.
- Provide patient-family health education, incorporating anticipatory guidance and information related to the childbearing year as appropriate.
- Generate and implement holistic and evidenced based plans of care.
- Demonstrate recognition of Texas Board of Nursing Practice Standards as they apply to clinical practice.

**Duration of Simulation**

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- Pre-brief: 1 hour

- State 1: 30 minutes

- State 2: 30 minutes

- Post brief: 1 hour

**Simulation #2 Intrapartum Care**

**Description**
The purpose of this module was to simulate uncomplicated labor and birth resulting in a spontaneous vaginal delivery, including medical procedures and labor support.

**Course Objectives**

- Apply nursing and developmental theories to the care of the childbearing family and her family.
- Demonstrate therapeutic communication skills with patients and families.
- Utilize clinical reasoning to provide a safe and therapeutic care environment for patients and families.
- Demonstrate a beginning proficiency in psychomotor skills.
- Deliver care in an organized, efficient manner.
- Provide patient-family health education, incorporating anticipatory guidance and information related to the childbearing year.
- Generate and implement holistic and evidence based nursing plans of care.
- Demonstrate recognition of the Texas Board of Nursing Practice Standards as they apply to clinical practice.

**Duration of Simulation**

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- Pre-brief: 1 hour

- State 1: 30 minutes

- State 2: 30 minutes

- Post brief: 1 hour

**Simulation #3: Mother/Baby Couplet Care**

**Description**
The purpose of this module was to simulate the care of a low risk postpartum mother and her newborn 1 hour after spontaneous vaginal birth.
Course Objectives

• Demonstrate therapeutic communication skills with patients and families.
• Utilize clinical reasoning to provide a safe and therapeutic care environment for patients and families.
• Demonstrate a beginning proficiency in psychomotor skills.
• Deliver care in an organized, efficient manner.
• Provide holistic patient-family health education, incorporating anticipatory guidance.
• Generate and implement holistic and evidenced based nursing plans of care.
• Demonstrate recognition of Texas Board of Nursing Practice Standards as they apply to clinical practice.

Duration of Simulation

3 hours

· Pre-brief: 1 hour

· State 1: 30 minutes

· State 2: 30 minutes

· Post brief: 1 hour

**Simulation #4: Care of the Pregnant Client Experiencing Complications**

Description

The purpose of this module was to simulate the care of a client experiencing both physiologic and social complications during late pregnancy.

Course Objectives

• Demonstrate therapeutic communication skills with patients and families.
• Utilize clinical reasoning to provide a safe and therapeutic care environment for patients and families.
• Demonstrate a beginning proficiency in psychomotor skills.
• Deliver care in an organized, efficient manner.
• Provide holistic patient-family health education, incorporating anticipatory guidance.
• Generate and implement holistic and evidenced based nursing plans of care.
• Demonstrate recognition of Texas Board of Nursing Practice Standards as they apply to clinical practice.

Duration of Simulation

3 hours

· Pre-brief: 1 hour
· State 1: 30 minutes
· State 2: 30 minutes
· Post brief: 1 hour

**Learning Outcomes:**

1. Integrate theoretical knowledge from arts and sciences in the demonstration of beginning clinical reasoning skills with the childbearing woman and her family.
2. Integrate concepts of: holistic care, family-centered care, and evidence-based practice into the care of the childbearing woman and her family.
3. Apply reflective thinking as a habit within maternal-child nursing practice.
4. Develop a beginning clinical specialty knowledge base to provide safe care to the childbearing woman and her family.
5. Provide developmentally appropriate health education to children and families.
6. Identify relevant applications of genetics and genomics in maternity care.
7. Identify risk factors and prevention strategies for priority maternal-child health concerns.
8. Integrate ethical standards, professional role, and culturally competent care in a maternal-child perspective to nursing care.
9. Demonstrate teamwork with students, faculty, and clinical staff in the shared learning environment.

**Evaluation**

At the end of the simulation activity students were asked to complete an online survey.

**Results of survey of students’ survey:**

Did this learning module substantially help with learning gains and improved skills for this course?

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<th></th>
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<tr>
<td>Yes</td>
<td>96.15%</td>
<td>No</td>
<td>3.85%</td>
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A comparison was made between the previous student groups, Cohort 2017, which numbered 37 students and the second group, Cohort 2018, which consisted of 26 students. The standardized Maternity Specialty Exam Scores were examined. A score of >850 was considered to be Acceptable Performance by the exam manufacturer.

In 2017, no simulations were conducted and the number of students scoring above 850 was 29/37 or 78%. In 2018, the simulations were implemented and the number of students scoring over 850 was 22/26 or 84%. In terms of overall course scores, there was an improvement in the number of students achieving a grade of "A". In 2017, 16/37 students, or 43%, achieved a grade of "A". In 2018 that percentage had increased to 50% with 13/26 earning an "A" course grade. Although a 10% improvement was not seen in either metric, the simulations promoted student centered learning by facilitating active student engagement and student satisfaction.

This project was implemented to facilitate learning in a diverse multicultural student population. The STEM grant made it possible to do so. Simulation is widely used in the training of nursing students and
the evidence supports that it is an effective way to promote learning and critical thinking. The evaluation of the project demonstrated that students were satisfied and they felt that they had acquired knowledge and clinical skills. Additionally, there were modest gains in test scores. The plan is to continue to utilize simulations to facilitate the understanding of nursing knowledge, improve clinical skills, critical thinking, clinical judgment, problem-solving, and clinical decision-making.

Currently, there is a plethora of evidence to support the use of simulation in nursing education. There is also a need to continue to evaluate the effectiveness of simulation across nursing courses and nursing programs. Additional funding for nursing education projects and research may be obtained by applying for available education grants.

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**Author Summary:** Dr. Rolle has been in nursing for 38 years. For her DNP project, she implemented an evidence-based practice project to promote postpartum depression education and screening. She presented her project at the Sigma Theta Tau 27th International Congress in Cape Town, South Africa July 21, 2016. Additionally, she presented the Effectiveness of Blended Learning in an Undergraduate Nursing Research Course at the 33rd Nursing and Healthcare Congress, October 23-25, 2017 in Toronto, Canada.

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**Author Summary:** Christen Sadler's nursing career began in rural Kenyan classrooms as an English teacher. Immersed in this vibrant culture, she witnessed the suffering of much loved neighbors due to preventable illness. The experience launched her into a lifelong professional journey through nursing, midwifery and education, pursuing improvements in health care for all individuals, particularly for the underprivileged. Her goal as an educator is to inspire gifted new nurses to care for the under-served and unheard.