Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project

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Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project

By

Brenda M. Seegmiller
Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project

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at Eastern Kentucky University

By

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Abstract

According to the World Health Organization (WHO), there are approximately 15 million babies born prematurely every year. Family members of premature infants in the Neonatal Intensive Care Units (NICU) are overwhelmed and lack confidence with basic skills to care for their newborn. Simulation is an education modality used for adult learners that utilizes a hands-on method for education and allows application of knowledge and skill development in a safe environment. Although clinicians are frequently trained utilizing simulation, there is limited information on its use among family members and caregivers. The purpose of this DNP Project was to explore use of simulation to teach family members of NICU patients’ basic skills to care for their newborn. Data collection included demographics, a pre- and post- training survey and a post-training follow up survey 2-3 weeks after discharge home. The goal was to improve health outcomes for the neonates by giving their family members a hands-on experience with a human infant simulator. Participants were instructed how to safely handle the infant, understand the importance of temperature management and what to do as the infant’s temperature varies. The response to the training was positive and parents felt more comfortable going home after having some practice with the manikin.

*Keywords:* premature newborn, infant, infant, simulation, training, caregiver, self-care, education, simulator, manikin
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Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project

Background and Significance

According to the World Health Organization (WHO), there are approximately 15 million babies born premature each year (Sarapat, Fongkaew, Jintrawet, Mesukko, & Ray, 2017). A premature infant is defined as an infant born before 37 weeks gestation. These infants are described as being high risk patients due to their potential for physiologic instability. Because they are fragile and premature, these babies are at great risk for many challenges including impaired brain development, immature organs, respiratory issues and trouble with feeding and emotional distress (Osorio-Galeano et al., 2017).

Premature infancy means a higher risk of mortality and morbidity (Osorio-Galeano, Ochoa-Marín, & Semenic, 2017.) These increased risks require infants be admitted to the Neonatal Intensive Care Unit (NICU) for specialized care, which can be very stressful for families. Studies have shown parents of these newborn premature infants are apprehensive and anxious to take care of these fragile babies (Alderdice, Gargan, McCall, & Franck, 2017). It can be scary, confusing, and overwhelming (da Silva, Barroso, de Abreu, & Oliveira, 2009). Celen and Arslan (2017) explain parents with infants in the NICU have higher levels of anxiety due to their complex health problems. Mothers are especially at risk, being noted as having significantly more anxiety than the fathers. Mothers worry about their efficacy when caring for a newborn in the NICU; as a result, they may be at risk for post-partum depression (Ingram, Redshaw, Manns…& Pontin, 2017).

Parents focus on the date of discharge and how they are going to handle things at home. Setting the expectation with parents on admit helps to alleviate some of the anxiety from day to day. If they are told their infant(s) will be hospitalized until the original due date, then discharging the babies early can also increase the parents’ anxiety. Despite being very nervous,
they do look forward to going home so they can feel they are in control of their baby’s care (Machado Pieszak, Moreira Paust, Calcagno Gomes, Moreira Arrue, Talsch Neves, & Martins Machado, 2017). Evidence suggests caregivers also worry about having the skills needed to be safely at home with their new infant.

Parents and family members who care for these infants when they transition home feel ill-prepared and overwhelmed to lose the support of constant bedside nursing care (Alderdice et al., 2017). These caregivers lack the confidence to care for their new baby due to feelings of fear regarding the fragility of the infant (Osorio-Galeano, Ochoa-Marin, & Semenic, 2017). Osorio-Galeano et al. (2017) continue to explain there are conflicting emotions for parents when they are discharged from the NICU with their infant. Parents fear they will not recognize signs and symptoms in their baby that may demonstrate illness or distress; they are concerned and feel the weight of the responsibility.

Simulation could be a solution to help minimize anxiety and improve skills to care for the infant. Simulation is a technique used in the medical community to teach skills in the context of a safe environment. Practicing skills without fear of repercussion (Sigalet, Cheng, Donnon… and Grant, 2014). However, using simulation to improve confidence and skill among family members is not well documented. The purpose of this DNP Project was to explore the use of simulation as a means for improving skill and confidence among families of NICU patients.

**Problem Description**

The premature newborn admitted to the NICU is a complex patient (Ramacciati & Addey, 2011). The infants are fragile and have many co-existing medical conditions due to their prematurity. Because of their complexity, a multi-disciplinary approach is necessary. Many professionals, such as neonatologists, intensivists, nurses, pharmacists, dieticians, and respiratory therapists combine their expertise to provide the best care for the infant. The intensity of
treatment for these newborns is often overwhelming for parents as they watch the clinicians constantly at the side of their newborn. After watching so many professionals surround the infant, when it’s time to transition home, parents frequently are nervous and anxious. The medical staff must also provide emotional support for the parents as they learn to cope and care for their new baby.

Osorio-Galeano et al. (2017) explain the parents’ lack of experience in caring for the premature infant at home is directly related to more frequent readmissions and the inability to recognize feeding issues. According to Aliabadi, Bastani, and Haghani, (2011) readmission rates are also decreased when parents participate in the infant’s care while hospitalized in the NICU. When the infants are stabilized, nurses are asked to encourage parents to assist with the care and daily tasks of their newborn, thus elevating the participation from passive to active participant in their newborns’ care during hospitalization (Mendizabal-Espinosa & Podsiadly, 2018).

Opportunity exists to better facilitate family engagement in the care of the newborn. The interdisciplinary healthcare team plays a key role in this endeavor. Nursing has daily contact with families during patient care and can play a vital role in teaching and reinforcing key skills that will be critical at home post discharge. These skills could provide the context of simulation scenarios for families.

**Proposed Evidence-Based Intervention**

Simulation as a learning modality focuses on experiential learning with a hands-on method in an environment where the patient cannot be harmed (Ferguson & Estis, 2017). Health care providers prefer simulation to didactic training due to advantages such as practicing repeatedly without harming patients and the simulators providing real-time feedback (Traynor, Gallagher, Martin & Smith, 2010). Simulation can be done with little to no budget, or with very expensive equipment. Manikins range from high to low fidelity. The low-fidelity manikins have
no built-in technology, such as a baby doll. The high-fidelity manikins, such as the one used for this project, utilizes technology to cry, breathe, turn blue, and exhibit signs of respiratory distress (Appendix A).

Utilizing simulation as a modality for educating patients or their family members has not been studied as extensively as using simulation for health care providers. Simulation involving patients’ family members as the participants is innovative and interactive, allowing the parents to practice skills for taking care of their newborn after discharge (Ferguson & Estis, 2017). Encouraging the parents to assist in the care of their newborn while still hospitalized focuses on family centered care (Celen & Arslan, 2017).

As previously discussed, nurses play a key supportive role in empowering parents to help in the care of their infants, encouraging them to touch their infant and hold them while visiting frequently. Nurses can also help ease the anxiety of the parents by giving explanations of the medical equipment being used by the infant. According to Sarapat et al. (2017), parental involvement, like family centered care, is beneficial for both the parents and the infant. Having the parents and family involved instills confidence and promotes bonding with the infant. Involvement also includes the parents being active caregivers in their infants’ care.

**Purpose of the Proposed Project**

The purpose of this project was to pilot a simulation opportunity with family members who have infants in the NICU. Utilizing simulation to teach parents should increase their ability to care for their child safely. Having parents and family members attend simulation should increase the confidence level of the caregivers as they provide care for their babies with the nurse’s assistance in the NICU. According to Sigalet et al. (2014), simulation activities will prove beneficial to help the infants’ caregivers become more confident and competent in their
skills when practiced on a human infant simulator. The family members of NICU infants will learn helpful skills relevant to taking care of their newborn safely.

**Leventhal’s Self-Regulation Theory**

Nursing practice is guided by theory-based research (Peek & Melnyk, 2014). Theory explains the correlation between variables and helps to understand how interventions work. Nursing theory helps to identify problems, design, develop and implement an intervention. After which nursing theory provides the framework for measuring outcomes.

In 1983, Johnson and Leventhal developed a theory to describe the relationship between healthcare experiences and outcomes called the theory of self-regulation (Peek & Melnyk, 2014). The self-regulation theory provides a framework for educational processes for patients undergoing procedures (Melnyk & Fineout-Overholt, 2019). The premise behind the theory is educating patients to give them a clear expectation of what is happening, their stress and fear can be lessened. This theory states having a stressor can cause a perception regarding changes that will occur due to the stressful event (Peek & Melnyk, 2014). Providing a person, or persons, with concrete information about what they will be going through, allows them to prepare so their anxiety level is not as high. Their expectation will meet reality.

The theory of self-regulation can be applied to patients, families or clinicians. Anyone can suffer anxiety from a stressful event. If parents of infants in the NICU are told what to expect while their baby is hospitalized, as well as when they return home, the expectation will become reality and the anxiety is kept to a minimum.

**Review of Literature**

A review of literature was conducted to answer the question, “Can simulation be used to improve confidence and skills of family members of NICU patients?” Cumulative Index of Nursing and Allied Health Literature (CINAHL), Medline, PubMed and the Cochrane
Collaboration were search engines utilized for the literature search. Keywords used for this search included neonate, infant, baby, premature infant, parents, caregivers, simulation, education, training, learning, discharge instructions, confidence level and self-care. The search resulted in 146 articles. A manual selection process was used to focus specifically on studies utilizing family members in simulation, those proving simulation beneficial for adult learners, and those surrounding the confidence level of parents of infants in the NICU. This narrowed the search to 22 articles. Multiple attempts to locate literature regarding simulation increasing confidence with family members revealed no results; however, many research studies have been published discussing the use of simulation as a valuable learning tool (Appendix B).

Sullivan-Bolyai, Bova, and Lee (2012) utilized a focus group as well as a randomized 2-group \((N=26)\) to explore an innovative type education for parents of children diagnosed with Type 1 Diabetes Mellitis (T1DM). A pediatric size human patient simulator was used to give the parents a hands-on experience of taking care of a child with diabetes. The parents involved were recruited from a diabetic clinic. The self-regulation theory by Leventhal was used for this study. Pilot study number 1 involved 10 parents who were taught using standard hypoglycemia protocols, each 30-60 minutes long. This training included monitoring glucose levels, treating hypoglycemia, as well as drawing up insulin and glucagon. Parents were also taught to watch for signs/symptoms of seizure activity.

For the second pilot study, parents were randomly assigned to a control group \((n=10)\) or intervention group \((n=16)\) using participant number-permutation assignment designed by the study statistician. The control group received the same standard teaching as the focus group, while the intervention group received the same education along with simulation scenarios about hypoglycemia. There was improvement (Cohen’s \(d=0.36\)) in student skills, knowledge and satisfaction. Scores indicated increased confidence levels for the parents and caretakers,
decreased stress related to their child’s diagnosis and recognizing distress cues early. Using the note-based technique, the parents in the focus group agreed they loved the simulation scenarios but wish the manikin could have thrashed about like kids do with real seizures. Parents in both the control group and intervention groups reported via questionnaire they felt the training was helpful and would love to have had the entire family included in the training.

Ferguson and Estis (2017) conducted a randomized control trial (RCT) to determine if video recorded simulation training would increase student’s ability to assess and document feeding skills in a NICU. The participants included baccalaureate nursing students and graduate-level speech language pathology (SLP) students (N=94) who were randomly divided into an intervention group (n=51) and control group (n=43). The control group included didactic training only while the experimental group included video recorded simulation scenarios in addition to the didactic training. These included a 10-question knowledge-based test score, clinical judgement score and documentation accuracy score. Both groups increased their knowledge as a result of the training, but the experimental group, having been a part of the recorded simulation scenarios were able to assess behavior patterns in the newborn infants and document those behaviors more accurately (p<.001). There were eight, 2-minute videos recorded based on human preterm infants experienced by the NICU. A high-fidelity infant simulator was used while recording these videos. There was no significant difference between the nursing students and SLP’s knowledge test scores. Learning effects were large for those participants in the video simulation group, as 17% more of the time they recognized and documented physiological signs more accurately. This study was not without its limitations; students did not have hands-on experience and were not prepared to function independently in a NICU at the close of the study.

Another RCT was conducted by Alexandrino et al. (2017) to compare the effects of caregivers’ education about children with upper respiratory tract infections (URTI) using
rhinopharyngeal clearance protocol and the health outcomes of those involved. The trial consisted of children (N=138) divided randomly into 4 groups- control group (n=38), education group (n=34), intervention group (n=35) and education/intervention group (n=31). The subjects were selected from 6 different child day care centers. Caregivers kept a journal for one month, documenting health outcomes after treatments. The 4 groups were compared using the SPSS statistics software, which held a confidence level of 95%.

The group comparison results showed subjects who were treated with the rhinopharyngeal protocol combined with increased caregiver education suffered the least from respiratory infections. The independent group comparison results also suggest caregiver education is directly related to the incidence of children with respiratory infections and acute otitis media (p=0.014), those who needed medical consultants (p=0.021), those on antibiotics (p=0.006), days missed from day-care (p=0.020), employment (p=0.021), and finally, those who needed nasal clearing assistance (p=0.011).

To study the effects of parental confidence in managing seizures, Sigalet et al. (2014) used simulation training as part of a RCT. Simulation has not been frequently studied using family members as participants in simulation. Participants were recruited if they had a child under 18 years of age with a recent diagnosis and admission with seizure disorder. There were N=61 participants in this study divided into 2 randomized groups according to family units (family members were kept in the same group). The control group (n=37) received traditional seizure discharge education. The experimental group (n=24) received traditional discharge education for seizures along with simulation-based training. All parents in both groups took a pre- and post- training self-efficacy survey along with an assessment simulation. Mastery learning framework was used to teach the participants. This meant practicing until they were prepared to be independent. KidSIM-ASPIRE Emergent Seizure management checklist was used
for this study, although it had not been previously validated. The reliability for this seizure management checklist was $a=0.87$ for the pre-test and $a=0.88$ for the post-test. There were no significant characteristic differences between the two groups, aside from group size due to dividing them by family unit.

Using pre- and post- medication seizure management, the experimental group had much higher post-intervention scores than the control group ($p<0.01$). The experimental group also had much higher scores on the efficacy questionnaire regarding seizure management at home ($p<0.05$). Using independent t-test samples the experimental group demonstrated better performance on 8 of 10 items. This study promotes the use of simulation as part of family-based care including medication administration, care and management of seizures.

A quantitative study involving classroom training along with a modified simulation practicum station was conducted by Hendricks-Munoz and Mayers (2014). This study was done to assess the impact of nurses’ perception on kangaroo mother care (KMC) to promote its use. Participants included 30 neonatal nurses who attended a 7.5-hour didactic training which included a practicum station about KMC care. A skills assessment was done to assess the nurse’s knowledge and comfort level before the training. Two quantitative surveys were utilized for pre- and post- KMC education training. Eight- and 24- item Likert scales were used for the pre-assessment. The post training was evaluated using direct observation for 6 months.

Results showed the nurses were more confident and competent in transferring infants to parents for skin-to-skin KMC care. The confidence of transferring infants on continuous positive airway pressure (CPAP) machines increased from 30-93% ($p=<0.0001$), while the confidence of transferring those infants on ventilators increased from 10-50% ($p=<0.004$). The nurses were able to promote the KMC care for better and more consistent parent utilization. With the nurse’s
encouragement the number of infants who received KMC care increased drastically from 26.5% to 85.9% post-training (p<=0.0001).

**Synthesis of Literature**

Five articles were selected to examine in depth regarding simulation as a learning tool for clinicians and the benefits of utilizing this modality. Of the five studies examined, three were randomized control trials (RCT), (Sullivan-Bolyai, Bova & Lee, 2012; Ferguson & Estis, 2018; Sigalet et al. 2014). One study was a control trial without randomization, (Alexandrino et al., 2017). Finally, a quantitative study was done with a pre- and post- study education didactic training session (Hendricks-Munoz & Mayers, 2014). All studies used some form of didactic/classroom learning as the dependent variable. Three of the RCT’s incorporated simulation into the training as part of the independent variable. The three studies that utilized simulation as the independent variable combined the simulation with didactic teaching to reinforce the learning.

The setting for two of the studies were at hospitals; one located in NYC (Hendricks-Munoz & Mayers, 2014) and another in Canada (Sigalet et al. 2014). One study was conducted at 6 different day care centers in the northwestern United States (Alexandrino et al., 2017). The other two studies were conducted at universities with graduate level students (Ferguson & Estis, 2018; Sullivan-Bolyai, Bova & Lee, 2012). Three of the studies involved clinicians (Alexandrino et al., 2017; Ferguson & Estis, 2018; Hendricks-Munoz & Mayers, 2014), while the other two included family members as caregivers in the simulation (Sigalet et al. 2014; Sullivan-Bolyai, Bova & Lee, 2012).

The common theme among the research studies involving parents was an increase in confidence level for those receiving discharge instructions. This was the case whether handouts were given in conjunction with simulation or verbal instructions were included with simulation.
training. The parents and clinicians liked being able to practice with a human simulator to get a more hands-on training approach. Collectively this supports use of simulation as a potential solution to improving outcomes for NICU patients by providing simulated opportunities for their family members. In other words, the approach is evidence-based (Appendix C).

**Agency Description**

To complete the pilot project, a partnering agency was identified. In this case, it is the employer of the primary investigator (PI). In addition to this student endeavor, the PI is currently employed at this agency as a Simulation Outcomes Consultant, measuring the value of simulation for the entire system. The project will also provide the opportunity to engage in leadership activities across the corporation. There is a possibility of the program being adopted by the other Level II and Level III NICU’s in the system, so there will be many chances for assisting with the rollout of the program corporate-wide as well.

**Project Facility**

The project facility is a 300-bed regional hospital. This hospital is part of a 24-hospital not-for-profit corporation and a level two trauma center for the surrounding area. The NICU at this facility is an 18-bed Level 3 unit. The hospital has recently undergone an extensive expansion project, growing the NICU from 10 to 18 beds. The NICU has three neonatologists who are experts in their field, who also provide telemedicine services to several outlying rural hospitals. The outlying rural facilities also life flight high acuity infants to this hospital for a higher level of care.

**Target Population**

This pilot project served those parents and family members who had infants admitted to the NICU. They were first time parents, grandparents, siblings, or other caregivers. Any family member who was going to help care for the infant at home was invited to the training. Older
siblings were welcomed so they could learn to recognize the signs and symptoms of distress when they were tending the baby.

**Congruence to Organization’s Mission, Goals, and Strategic Plan**

The mission statement of the corporation where the project was held, is “Helping People Live the Healthiest Lives Possible” (retrieved from: https://intermountainhealthcare.org/about/who-we-are/mission-vision-values/). This statement includes helping infants grow to be strong children and adults. Providing the parents an experience to work with a human infant simulator gave them the opportunity to learn how to handle their baby safely and securely, while gaining confidence in their ability to care for their baby.

A current initiative at this organization is called “Partners in Healing.” This initiative invites family members to assist in the care of the patient. The goal is to help the family member feel they are a part of the care and healing process. Families feel empowered as part of the health care team, reducing their feelings of anxiety. The Partners in Healing program also increased family members’ confidence level in caring for their family at home when it was time (retrieved from: https://intermountainhealthcare.org/news/2018/02/engaging-family-members-in-care-of-hospitalized-loved-ones-enhances-healing/). In the NICU environment, Partners in Healing includes the family participating with core activities such as changing the baby’s diaper, checking their temperature, bathing, swaddling, and skin-to-skin contact with the baby.

**Description of Stakeholders**

The nurse manager of the NICU, along with the nurse administrator and neonatologists at the facility were eager to see the simulation project take place. The aim for the simulation project was to provide the parents with a positive discharge teaching experience; teach them to care for their baby, recognize the signs of a decompensating infant, and understand the importance of
temperature management. The leadership team at the facility will receive a summary about the project and the results, along with recommendations for the future and sustainability.

**Project Design**

This pilot project was designed as a quality improvement initiative that included a pre-post data collection process. In addition to the basic demographic information, a confidence assessment was done before the simulation and training activity as well as immediately following the training. Highlights of the debriefing were documented. There was an impact survey conducted 2-3 weeks after each baby was discharged home. This survey asked for application of skills by the parents, to see what skills they were able to apply since the simulation activity. Staff involved in the project were also surveyed to gather feedback on the process. Specific details are further discussed in the Project Methods. The ultimate goal of the pilot was to upscale simulation for families to other departments in the hospital system.

**Project Methods**

**Implementation Framework: Phillips “V” Model**

The Phillips “V” Model was utilized for this simulation project (Appendix D). This model is an alignment process involving a thorough needs assessment and definitive evaluation process, with objectives linking the two processes. This model was designed by Jack Phillips in 1973 as part of a Return on Investment (ROI) evaluation process (Buzachero et al., 2013). It is based on the Kirkpatrick education model of learning evaluation using the four phases of the model (a) reaction, (b) learning, (c) behavior, and (d) results. Kirkpatrick’s model of evaluation is very comprehensive with each level having an impact on the next (Abdulghani et al., 2014). Phillips designed the needs assessment based on these concepts; each being based on the level below.
**Needs Assessment.** The needs assessment, the left side of the V, begins with the payoff opportunity; meaning, what benefit will come from doing this project, then the business need means what will happen if the project is not completed. The performance need is the behavior that needs to change in order to accomplish the business need. The next level is the learning need which determines what the participants need to learn to change the behavior from the previous level. Finally, the preference need is how the participants prefer to accomplish the learning need. This usually is the mode of presenting the relevant material, by either didactic classroom training, virtual reality training, or simulation, which was the modality chosen for this project.

**Evaluation.** The right side of the V is the evaluation process, also called the ‘Chain of Impact’. This begins with the reaction evaluation, usually completed by the participants immediately after the learning activity. The next level is the learning evaluation. The questions asked regarding these levels are directed toward whether the participant liked the training, found it relevant, and determines what they learned in the process. The application evaluation comes next. This can be done via survey as well and is generally combined with the impact evaluation. To gather data about application and impact, the participants must explain what they have applied and designate an attribution to how much they learned in the training activity. After the project is deemed sustainable, the payoff opportunity, or return on investment (ROI) can be determined. Not all projects can be taken to the ROI level.

The needs assessment and the evaluation process are linked together with program objectives at each of these levels. These are overarching objectives linking from one level to another between the needs and evaluation pieces. This model can be applied for all purposes. It has been used widely in the business world but can be applied in healthcare for clinicians and patients. For the purposes of this project the model was applied to parents and family members of infants in the NICU and the simulation training in which they participated.
Ethical Considerations

According to the American Nurses Association, a nurse’s first duty is to do no harm (ANA, 2015). Participants in this project, families and staff, were at minimal risk of harm. Staff experienced no work-related repercussions for non-participation. Likewise, the only harm to the families was a missed opportunity to learn essential care-taking skills.

Institutional Review Board

Applications were submitted to both the project facility and the University IRB. It is not ideal to work with two facility IRB’s, but after some confusion it was decided the best way to proceed would be to submit to both review boards. Because there was no direct patient involvement, the expedited review forms were submitted. When approval was granted from the partnering facilities, the project was started right away.

Recruitment & Consent

During the IRB waiting period, the PI began recruiting the NICU nurses to assist with the project. As it turned out, due to the project facility research requirements, the assisting nurse was required to have completed the Collaborative Institutional Training Initiative (CITI) training modules. CITI training is several modules regarding research and how to communicate and work with human subjects. There was only one nurse, a Neonatal Nurse Practitioner (NNP), who met these requirements. She was more than willing and agreed to assist with the upcoming training. As soon as permission was granted to implement the project, the PI attended shift huddles to explain the process and make staff members aware of the project and how it would go forward (Appendix E). A descriptive poster was also put on display on the NICU bulletin board, where the nurses were able to visualize it daily (Appendix F).

The PI was the key player for recruiting family members to attend the training sessions. Recruitment flyers with simulation and training information were developed to deliver to the
family members (Appendix G). The PI approached the parents and families regarding the pilot project to give a thorough explanation. The explanation included the project process from beginning to end. The goals and objectives of the project were explained. Details of the simulation and didactic training sessions were discussed as well. During the recruiting process, the nurses were well versed to assist in answering any questions the family members may have had as well. The contact information of the PI was almost made readily available to staff members or participants in case questions came up that couldn’t be answered by the nurses.

At the beginning of each training session, consents were obtained and the *Demographic Survey* (Appendix H) completed by the participants. The consents contained verbiage to allow the PI to use survey data filled out immediately post simulation. The informed consent (Appendix I) also allowed the PI to conduct an application/impact survey over the phone. This call took place 2-3 weeks post discharge to home. Siblings who were available to attend, but were under the age of 18, required a parental consent form (Appendix J) as well as completion of an Assent form (Appendix K) to participate. There was only one adolescent who did attend with his parents. All participants were required to have some form of consent to participate, whether adult or child.

**Creation of Simulated Scenarios**

Two scenarios were developed by the PI; one is a stable baby (Appendix L), and one is a fevering baby (Appendix M). These cases were given to a neonatologist, NICU nurse educator and two other staff nurses for review. With the feedback from each of these stakeholders, the scenarios were changed to meet the needs and the educational format for the NICU at this facility.
Implementation Procedures

For this project, the participants were brought to the simulation space to participate in traditional classroom learning as well as role play scenarios. A human infant simulator, appearing to be 25 weeks gestational age, was offered for use, to look and sound like a real premature infant. This manikin baby can cry, breath, turn blue around the lips and demonstrate respiratory distress. Utilizing a manikin removed the risk of an infant being injured during training. The training took place in a space close to the NICU, so parents did not have to leave their baby’s side for an extended period.

Before the simulation occurred, participants were given a short explanation regarding the process, then the Demographic Survey (Appendix H) and the Pre-Training Checklist (Appendix N) were completed by each participant. Then, a short training session was done by a content expert to teach the parents how to check the baby’s temperature, how to trouble shoot if the baby was fussy, and to watch for signs and symptoms of distress in the infant. With this manikin, the participants were given scenarios to treat as real so they could deal with situations that arose when they were discharged to home after their baby was stable.

During the training, the NICU nurses marked a Skill Checklist (Appendix O) indicating whether the participant was able to correctly demonstrate the skill being taught. There was an area to designate if the participant needed encouragement or reinforcing of a skill, so the nurses in the NICU would be able to repeat a similar task training with the participant.

Directly after the simulation and training was complete, there was a Post-Training Checklist (Appendix P) filled out by each participant. Then a formal discussion, called a debrief, followed. This discussion was facilitated by the NNP content expert who had special training to do so. The PI took notes during the debrief to record parents’ reactions and comments as they learned. The debrief is where the learning took place, because participants were able to discuss
what went well and what they would change, and the discharge processes could be better explained.

**Data Collection Process/Outcomes Measures**

Demographic data was collected before each training session from a representative of each family. Reaction and learning data were collected immediately following the simulation session and skill training. The *Pre-Training Checklist* and the *Post-Training Checklist* were in paper form; for distinction between sessions and surveys, a different color was utilized for each session. The survey questions were basic questions to determine if the family members found the simulation training relevant, beneficial and helpful for caring for their newborn during and after hospitalization in the NICU.

Two to three weeks post discharge from the NICU, the PI called the representative from each family to follow up regarding the training. The questions asked over the phone were from the *Post-Training Impact Survey* (Appendix Q) regarding application and impact of the training. Participants were asked if they had the opportunity to use any of the skills learned. They were also asked if the training was helpful, and if there was anything they felt could be improved for other learners in the future.

Data was collected by the PI. The *Pre- and Post-Training Checklists*, as well as the *Demographic Survey*, are paper. The *Post-Training Impact Survey* was verbal, with notes taken by the PI. The paper format surveys were analyzed by the PI and combined with the data from the impact survey. Data was collected until 90 percent of participants had been discharged and were contacted by the PI.

The *Pre-Training Checklist* and *Post-Training Checklist* are anonymous, with no participant identification. The *Demographic Survey* instrument included the participant’s name and phone number for the purpose of the follow up phone call. The identified information was
not utilized for any other purpose, nor was it shared with others. The PI is the only person with access to the information. The tools are now stored and will be destroyed per the policy of the facility IRB.

The NICU Staff Survey (Appendix R) was deployed electronically utilizing the Survey Monkey tool one week after the completion of the project. It was sent to all staff of the NICU who interact with family members. The objective of this survey was to get the staff member’s perception of the training and how the behavior and actions of the family members may (or may not) have changed due to the training.

**Outcome Measures & Tools**

Outcome measures are important to compare one treatment or process to another (White, Dudley-Brown & Terhaar, 2016). Gathering evidence and collecting data provides a great amount of information to clinicians regarding the treatment they provide. Outcomes are used for process improvement and improving patient care. For the purpose of this project, the outcomes being measured were compared in a pre-post-training format. The confidence level of families who participated in simulation were markedly improved after the training.

**Demographic Survey.** One representative from each family was asked to complete a descriptive survey about participating family members. This form provided specific data regarding the population being trained.

**Pre- and Post-Training Checklists.** Other instruments being utilized for this project were surveys developed by the PI. The Pre-Training Checklist was given to participants before the skills station portion of the training. The Post-Training Checklist was completed by the participant again after the simulation. There was a comparison analysis done for the learning and reaction phase immediately before and after the simulation activity. The Pre- and Post-Training Checklists evaluated the confidence and competence level of participants involved.
**Student Satisfaction and Self-Confidence in Learning Tool.** The *Student Satisfaction and Self-Confidence in Learning Tool* (NLN, n.d.) (Appendix S) was used for this project with parents and family members of NICU infants. This tool was designed for clinicians who attended simulation sessions. There are two sections in the survey regarding satisfaction and self-confidence. It is a 5-point scale, rating from one (strongly disagree) to five (strongly agree). Permission to utilize this tool developed by the National League for Nursing (NLN) was automatically granted for use in projects completed by DNP students. The PI is responsible to make sure the citations for the instrument are correct.

There was minimal training required for use of this tool. When revising the questions for non-clinician use, the simplicity of the questions remained intact for better understanding of the individuals involved. A brief description of the tool and its use was provided from the NLN website for reference when needed.

**Skill Checklist.** This tool was used for the nurses during the training to communicate with the nurses at the bedside if the family members and caregivers were competent with the skills being taught, or if further reinforcement and encouragement was needed. If no further training was needed, each participant received a Certificate of Completion (Appendix T).

**Post-Simulation Impact Survey.** This tool was used to evaluate the participants' experience after returning home. This survey tool was completed 2-3 weeks from the infants’ discharge date. The PI called a designated family member representative and asked questions from the survey. The PI took notes regarding the data collected so these conversations were not audio recorded.

**Staff Survey.** The staff were questioned via an electronic survey tool regarding their experience with the parents and family members after attending the training. They were asked their perception as to whether the family participated and became a more active member of their
baby’s care team as well as if the project should be developed into a sustainable curriculum for use in the unit.

**Methodology**

**Data Analysis Plan**

**Demographic Survey.** The data from this survey was gathered to describe the population of participants. This survey contained identifiable information such as a phone number for the PI to call when completing the Post-Simulation Impact Survey.

**Pre- and Post-Training Checklists.** These surveys were used to measure the increase in confidence of those parents and family members who participated in the training. The data from the pre- and post-training checklists have been analyzed with a paired *T*-test.

**Student Satisfaction and Self-Confidence in Learning Tool.** There was no data pulled from this tool. It was a guide for the debrief discussion after the training. Qualitative data was extracted from the written notes during those discussions.

**Skill Checklist.** Quantitative data was collected using the measure of central tendency to determine statistically how many participants needed reinforcement versus those who were able to competently complete the task.

**Post-Simulation Impact Survey.** Qualitative and quantitative data were extracted from the information gained from the phone conversation held with the family member representative.

**Staff Survey.** Data extracted from this survey was qualitative and subjective as it is asking the opinions of staff members about the increased participation of family members during their baby’s hospitalization.

The only data containing identifiers from those participants who were willing to receive a follow up phone call is the *Post-Simulation Impact Survey*. This survey was in addition to the
Post-Training Checklist completed immediately after the simulation session. All survey data is being compiled for comparison and analysis.

The qualitative data was reviewed by the PI who noted which themes were identified. The quantitative data was extracted and transferred to the data analytics platform SPSS Version 26 for detailed analysis. Statistical tests were conducted on quantitative data. The DNP team reviewed results for accuracy. All data gathered is stored according to the regulations of the facility IRB. Raw data will be destroyed according to the policy of the facility IRB as well.

**Timeline of Project Phases**

The pilot project began September 20, 2019 when IRB approval was received from both the university and the project facility. Because the calendared sessions were to begin the day of approval, the PI immediately got all paper documents printed and organized, then went to the NICU and began recruiting participants. Following which, the PI and content expert NNP set up the break room as a simulated home nursery.

There are about 40 infants admitted to the local NICU per month, with an average length of stay of 16 days. For the convenience of the participants, each training session was offered 3 times, for a total of 21 sessions (Appendix U), completed on seven different dates.

The data collection and analysis period occurred immediately after the simulation sessions were completed. Data was collected by October 18, 2019. An executive summary was written in report form and provided to key stakeholders of the project facility at the beginning of November. Completion of the project, as indicated by presentation to the university doctoral program staff, is scheduled for presentation on November 22, 2019.

**Resources**

One of the Neonatal Nurse Practitioners’ (NNP) from the NICU, a content expert, assisted with the training. She was the only nurse who had previously completed the required
CITI Training: a research program to understand how to work with human subjects. She graciously donated her time to do the training for all sessions, as this is her area of expertise. The NNP had also been through a simulation facilitator course accredited by the Society for Simulation in Healthcare for facilitating simulation scenarios.

The simulation space, human infant simulator and all other equipment were approved for use by the nurse administrator at the facility as well as the Simulation Consortium Director at the corporate level. A crib and a rocking chair were placed in the employee break room to transform the space into a home nursery. The only purchases made by the PI were a small thermometer for demonstration purposes as well as the cost of printed materials. There was no significant cost to the PI for implementation of this project.

The NICU nurse manager was very supportive of her staff donating their time to help with the project. The NICU nurse educator was also supportive and very helpful in assisting with the planning of scenarios and training. She provided insight into the processes and procedures of the NICU to assist with the planning and best practice to accommodate their patient and family population.

**Results**

The average daily census during the project was six to eight infants. From that group of infants, 10 family members participated in the hands-on training. Because these infants had been in the NICU for many days, several of the family members taught were able to take their babies home within two or three days of the training. The findings of the project are reported and discussed in the following four sections: (1) the *Demographic Survey* and (2) the combined results of the *Pre- and Post-Training Checklists* with (3) the *Post-Training Impact Survey* next, then (4) the *Staff Survey*. For this project, data collection began on September 20, 2019 and
completed on October 21, 2019. Codebooks were developed for each instrument. Data was then transferred into the *SPSS Version 26* data analytics software.

**Demographic Survey Results**

The *Demographic Survey* was completed by all 10 participants. These survey results were analyzed using a measure of central tendency. All participants were directly related to the infants, with 60% (n=6) of those being mothers, and 20% (n=2) being fathers. The other participants consisted of an aunt and a sibling. Over half of the participants were between the ages of 25-39 (n=6, 60%, \( m=31 \)). The education level of the participants differed from middle school to a master’s degree. Seventy percent of participants (n=7) had spent some time at college, while only 30% (n=3) of those graduated with a degree (Appendix V).

**Pre- and Post-Training Checklists Results**

All 10 participants completed both the *Pre- and Post- Training Checklists*. Statistically significant improvement was noted in each of the skills taught. A two-tailed paired samples *t-test* revealed participants did have significant improvement in their confidence for each of the skills measured. For each skill taught, the results were as follows: handwashing (\( p=0.193 \)); checking the baby’s temperature, (\( p=0.134 \)); changing the baby’s diaper (\( p=0.751 \)); dressing the baby (\( p=0.555 \)); swaddling the baby (\( p=0.273 \)); and cooling the baby (\( p=0.048 \)).

On a Likert scale from one (very uncomfortable) to five (very comfortable), many of the participants (n=8) reported they were slightly comfortable (not uncomfortable but need more practice) or very comfortable with the skills being taught. There were two participants (20%) on the *Pre-Training Checklist* who specified very uncomfortable for three different skills: checking the baby’s temperature, changing the baby’s diaper and cooling the baby. On the *Post-Training Checklist* one participant marked the one on the Likert Scale to describe the continued discomfort for changing the baby’s diaper (Appendix W).
On analysis of qualitative comments, the obvious theme was nervousness at going home with an infant who is at risk for so many health problems. One mother stated, “I’m looking forward to going home, but I’m nervous because I’m not sure what to expect.” Another mother stated, “I’ve never had a child at home with oxygen, I hope she doesn’t have to wear it long.” A father in the group said, “I wish our 17-year old daughter had come to this training, she will be watching the baby sometimes.”

**Post-Training Impact Survey Results**

The *Post-Training Impact Survey* was utilized for the follow up phone call to the designated representative from each family that participated in the training. The PI made the phone call to see if the participants had used any of the skills learned in the training while their infant was hospitalized. One of the participants was excluded from the impact survey because she is still with her infant in the NICU. There was a total of four participants called.

Participants reported they felt the training was helpful but should have been done at the bedside, so they did not have to leave their baby to attend. However, they liked not having their baby involved in the simulation. Incidentally, part of the routine discharge teaching at this facility is to watch a video demonstrating the proper procedure for CPR and choking in infants and children. If they attended the training after having viewed the video, the participants reported the opportunity to practice doing CPR with the manikin was especially helpful. Participants were grateful to use a manikin to practice back blows and chest thrusts required to help a choking infant.

One mother found the CPR and choking session most helpful, although she said, “thankfully I haven’t had to use it yet, and hopefully never will.” The themes noted by the PI while talking to the family member representatives were gratitude for the training and a more comfortable transition to home because of the training received.
The PI spoke to several mothers of the infants who reiterated they were grateful for the training and found the session regarding the importance of temperature management very helpful. Two of those family members report having to check their baby’s temperature when they were fussy and had no obvious reason, only to find their infants were likely too cool. After swaddling the infant snuggly, they calmed right down and went back to sleep. A different mother reported the opposite. Because of what she learned in the training, she determined her baby was too warm, so she removed the swaddle blanket and opened the baby’s onesie until the baby cooled off.

**Staff Survey Results**

A short survey was sent via Survey Monkey® to those staff members who interact with the NICU families daily. The survey was sent to 25 staff members (Appendix X). Of the 25 surveys sent out, 4% (n=1) were completed. This survey contained only a few questions regarding whether the staff members felt like the simulation training was helpful. They were also asked if the training should be implemented and sustained on the unit. When asked if the parents and family members became a more active part of the infants’ care team, 100% (n=1) of those who responded, answered positively the participants were more engaged in their infants’ care. This one survey participant responded with total agreement the program should be continued.

**Discussion**

The minimum expectation of 10 people was met for this study. Of those participants, 80% (n=8) were parents. There was a significant increase in the outcomes from skills taught from pre- to post-training scores. Those who participated were grateful for the training. Family members and staff agree the training should be continued on the unit. One first time mother said, “thank you for educating me on how to keep my baby safe.”
Limitations

**Study Design.** Due to the time of year, the census was low in the NICU, meaning there were not as many family members to train as there would have been in the winter months here at this facility. Another barrier encountered was, most of the infants during this time were feeders and growers, or healthy growing babies, preparing to go home. One of the participants stated, “I wish I had this training when my baby was first born while she was so small, maybe I wouldn’t have been so nervous to hold her.”

Additionally, the time frame of the study was a barrier. This project needed to be completed by mid-October due to graduation constraints and timing of the project, so there was only a two-week time period the sessions could be offered. Because of this short time period, only one of the infants in the NICU, whose mother was a participant, remains a patient there. He was born at 27 weeks, just the week or 10 days previous, so he will be a patient there for several more weeks. The rest of the babies were preparing for discharge, were bigger, and had no issues by the time the training took place.

Because of the length of time many of the babies had been in the NICU, and preparing to go home, the parents and family members did not want to use the Premature Anne infant manikin. They did not like the way she looked, and one mother stated, “My baby doesn’t look like that anymore, so I don’t want to practice with that doll”. Simulation has only been a method of training in healthcare for the last decade or so. Participants and families had not heard of simulation or what it entails, which made them very hesitant to participate. “I don’t want to feel like I’m being judged,” one mother said.

**Resources.** Because the project facility requires CITI (research) Training from all persons who would encounter the human subjects, this narrowed the nurse candidates available
to assist with the training. Thus, one nurse was the content expert for all training sessions. She is currently a practicing Neonatal Nurse Practitioner (NNP) in the unit.

**Negative Responses.** An interesting observation noted by the content expert and PI was those family members and parents who the nurses felt would benefit most from the training are those who were quick to decline the invitation to participate. After multiple conversations there was always one excuse or another for not attending and taking advantage of the training. One couple said, “we have to go pick up our dog and take him home. We don’t think we can participate.” After setting an appointment to meet with this couple later, they did not come.

**Recommendation for Future Redesign of the Simulation**

After discussion with the content expert (NNP) it was decided if the project were to be repeated, the PI would make specific appointments with the parents so they could invite any eligible family member who would be helping with the baby to attend. The training would be held at a time convenient for the family members so the PI would accommodate and make it work (within reason). During this project, due to calendar scheduling, and the hours of the sessions, there were several hours spent in the NICU with no participants. This time was used to round with family members and attempt recruiting, but some family members stated they did not want to leave their babies. Other family members stated they were not interested in the training because they had previous experience with children in the NICU, so they already had a grasp on what to do and how to take care of their babies. One mother said, “if she were my first baby I would for sure be more nervous, but I’ve had experience in the NICU before.” Interestingly, those parents who declined the need for the training are the ones the nurses felt would benefit the most.

Despite the explanation regarding simulation, and the assurance there was no judgement, the simulation training evolved into more of a ‘table-top’ scenario than a true simulation.
Participants were uncomfortable “acting” so they were not pressured into something they did not want to do. The PI read the scenario to the participants and they walked through the process of what they would do in each of the two situations, more in the form of a discussion. Thus, determining it was not necessary to set up the break room like a home nursery.

Most of the participants were agreeable to utilizing the CPR doll for practicing CPR and choking as well as for swaddling. They didn’t want to use the tiny baby, because their babies had already been in the NICU long enough to have grown over five pounds.

After further discussion with the NNP, this project may have been better if divided into two projects. One phase for admit, or soon after, and another for closer to discharge. The admit portion would have to be decided on a case-by-case basis depending on the capabilities of the parents. For example, one mother was an emergency caesarean section, so she remained a patient at the time of training, while the father was at the baby’s bedside in the NICU. It would have been difficult to train her until she had the ability to be at the baby’s bedside and could participate more fully.

The admit portion of the teaching should utilize the Premature Anne manikin. This manikin would be helpful to teach the parents and family members about skin-to-skin contact and how to hold a tiny baby close and carefully. If needed, the manikin can be intubated and connected to a ventilator to show parents how to maneuver the cords and wires (with help, of course), so they won’t be as nervous when the nurses are handing them their baby with all the wires attached.

The second training session to be offered should revolve around discharge teaching and utilize the low-fidelity CPR manikin to practice procedures for choking and CPR. The participants appeared more comfortable with this doll, as it was closer to the size of their own babies. This training could also teach valuable information such as the importance of temperature
management in the premature infant, and case studies regarding what to do for the cool or warm infant. A handout regarding this subject would be a helpful reminder for the participants at home to hang on the refrigerator where it can be seen frequently. One mother suggested the training on how to properly buckle the infant in the car seat would be very helpful to be included as well.

**Implications**

Clearly this project had an impact within the NICU. However, there are implications affecting this unit beyond the context of the project. The following section discusses the implications regarding clinical practice, policy, quality and safety, and education.

**Clinical Practice**

Nurses in the NICU perform discharge teaching frequently. The nurses start teaching the parents how to care for their new infant while in the NICU soon after the baby is admitted. Then as the infant’s health status improves, the nurses teach about caring for the baby at home. To change the format of the discharge teaching for parents, for example, to include simulation with the training, would not add a significant amount of time to the training sessions. The training will be more organized, evidence-based and practical if simulation were to be incorporated routinely.

**Policy**

At the project facility, there are no policies that would need to change in order to accommodate a program and training curriculum such as this. The nurses already do discharge teaching and document said teaching in the patient’s Electronic Health Record (EHR). One point to consider when implementing this type of teaching is what charges will incur if the EHR contains documented education for families. Is education a separate charge for billing purposes? Will there, or should there be, an ICD10 code or procedure modifier attached to this training? Beyond this unit, required policy would need to be assessed on an individual basis.
Quality and Safety

When discussing the quality of education and training regarding parents and family members of the NICU, there was significant amount of variability. The content may be the same because curriculum was developed, however, the nursing staff are all different individuals with varying experience, so the teaching style of each nurse may be different.

In order to attain the highest quality training program, it would be best to have a standardized curriculum throughout the system, so all hospitals are teaching the same content consistently. When it comes to discharge teaching, nurses self-report their discharge teaching is inconsistent from patient to patient (Aris, Stevens, Lemura... Harrison, 2006). After a standardized curriculum is developed and parents/family members have been through the training, further studies are warranted to determine if the quality of the education is such that there are fewer readmissions, decreased unnecessary visits to emergency departments as well as completing audits or questionnaire’s to see if the appropriate level of care has been sought for different situations.

Another point to consider in a study like this would be to distinguish between Value-Based Care (VBC) versus Fee-for-Service (FFS) facilities. If an urgent or emergent care facility is FFS, their reimbursement will decline and have a negative effect on their revenue. The project facility is a Value-based Care facility. Physicians and clinicians are reimbursed for their quality of care, and thus risk losing funds if there are readmissions due to inappropriate discharges or underwhelming training resulting in lack of knowledge for family members caring for the new little ones.

Education

Partners in Healing is the program driving the education for NICU parents and families. This is family-focused care involving those who come see the baby and lets them be a part of the
infant’s healthcare team. As part of the education process, parents should be given handouts and talked to specifically about their needs when they return home, not just given a piece of paper with names and phone numbers. This method can be unsafe and prove not helpful when questions arise at home (Purdy, Craig, & Zeanah, 2015).

There is not a lot of literature regarding simulation at the bedside involving patients and/or family members. This is an opportunity to train simulation educators to help facilitate the hands-on modality of discharge teaching to those nervous, overwhelmed parents and family members.

**Sustainability**

The NICU education team at the corporate level is planning to assist with implementation of curriculum changes for each of the NICU’s in the partnering system. There are many points to consider when planning for educational changes. This would involve training the nurses according to the content involved in the curriculum. Not all nurses in the NICU are simulation facilitator trained. The nursing staff frequently attend and participate in simulation for their own clinical training and have bought into the simulation process. If there is to be true simulation during the discharge teaching, a few nurses, depending on the ratio of staffing, will need to be trained facilitators.

At first, explaining to the families what simulation is and how it works will be complicated. During this project, the participants were hesitant to do simulation. Many of them stated they had not heard of it, let alone participated before. When simulation is explained as a type of role-play for education, it became a little clearer. Recruiting families was difficult for the project, so if the entire education process changed, and it became the new normal, it may take some time for parents to be comfortable, but over time it should become easier; especially as word of mouth gets around from one parent to the other.
Because the work involved in changing and sustaining education is plentiful, this type of education for all parents and family members will require at least a half-time position for a similar size NICU as the project facility. It is best if hospitals have educators to specifically train parents and answer their questions (Purdy et al., 2015). Each facility should do a needs assessment according to their census to determine how many educators it will take to sustain this program in their units. The cost of materials, if not done electronically, should be covered by each facility.

**Future Scholarship**

**Plan for Dissemination**

An executive summary will be compiled and presented to select members of the leadership team as well as NICU leadership at the project facility. The PI is planning to publish findings in a nursing journal after presentation to the college for the graduation requirements of the DNP program. A formally written summary was sent to the university staff for approval and presented to the DNP staff via interactive technology. There are no other studies taking place at the partnering facility regarding simulation with family members. It will be recommended to the corporate NICU educators to change the format of the discharge teaching for those family members going home with new babies from the NICU.

The PI plans to submit a manuscript for publication to the *American Nurse Today* as well as the *Journal of Nursing Education*. As previously noted in the literature review above, there are very few studies done pertaining to family members in simulation. There are no studies readily available regarding simulation with families in the Neonatal environment.

**Future Research/Evidence-Based Practice Projects**

Further studies are indicated to be completed over a longer time period, to determine if the training and education offered to the family members did indeed help decrease the number of
unnecessary emergency department visits. Studies could also measure the parents’/family members’ ability to choose the appropriate care for situations that arise when the infant and families have transitioned home. Ingram, Powell, Blair… Fleming (2016) state emergency departments are over-utilized by families of preterm babies who did not get proper training before discharging to home.

**Conclusion**

As stated previously, studies have shown parents of premature infants are apprehensive and anxious to take care of their fragile babies (Alderdice, Gargan, McCall, & Franck, 2017). It can be scary, confusing, and overwhelming (da Silva, Barroso, de Abreu, & Oliveira, 2009). This proved true when talking with parents in the NICU of the project facility. Many parents verbalized their concern and feelings of being overwhelmed at the prospects of going home. They were, however, grateful for their time in the NICU, learning from the excellent nurses who had cared for their babies. Family members who participated in the study did verbalize gratitude for the opportunity to “practice” taking care of their baby and being able to perform the motions of back blows, chest thrust, compressions and breathing for the baby. They stated this would help them remember the process if they should ever need it.

This project was helpful to those who participated and would be helpful to others in the future if the curriculum was changed to accommodate this modality of learning/training. A structured program for discharge planning improves quality of care and patient (parent) satisfaction by decreasing the number of emergent care visits (Ingram et al., 2016).

Simulation has proven to be an effective learning modality for adult learners. Simulation focuses on learning with a hands-on approach utilizing a human infant simulator, so no harm will come to the patient (Ferguson & Estis, 2017). If simulation were incorporated into the discharge teaching curriculum for those parents and family members of the NICU, the ability to practice
these skills with their babies will build their confidence and embed these skills into muscle memory. The parents will demonstrate competence in the NICU as they become a more active participant of their infant’s healthcare team. Helping with their own baby’s cares while hospitalized in the NICU will better prepare them to be comfortable with their baby when it’s time to transition home.
References


Appendix A: Premature Anne Manikin
## Appendix B: Summary Evaluation Tables

<table>
<thead>
<tr>
<th>Citation (Full APA)</th>
<th>Study Purpose</th>
<th>Conceptual Framework</th>
<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Major Variables Studied and their Definitions</th>
<th>Measuremen t of Major Variables</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth to Practice</th>
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<tbody>
<tr>
<td>Alexandrino, A., Santos, R., Melo, C., Bastos, J., Postiaux, G., Alexandrino, A. S., &amp; Bastos, J. M. (2017). Caregivers’ education vs rhinopharyngeal clearance in children with upper respiratory infections: Impact on children’s health outcomes. <em>European Journal of Pediatrics, 176(10), 1375-1383.</em></td>
<td>To compare the effect of caregivers’ health education regarding children’s respiratory infections and the effect of a rhinopharyngeal clearance protocol in children with Upper Respiratory Tract Infection (URTI)</td>
<td>None</td>
<td>Control trial without randomization</td>
<td>Children up to 3 years (N=138) divided into 4 groups *control group (CG) (N=38) *education group (EG) (N=34) *intervention group (IG) (N=35) *education and intervention group (E/IG) (N=31) *conducted at 6 day care centers</td>
<td>*CG no intervention *EG caregivers attended health education session *IG rhinopharyngeal clearance protocol used *E/IG group caregivers attended health education session and also performed rhinopharyngeal clearance protocol</td>
<td>Pediatric Respiratory Severity Score (PRSS) used to assess respiratory conditions for objective parameters. Subjective parameters determined by interview of caregivers</td>
<td>Chi square test used to compare between 4 groups and Fisher’s exact test for dichotomous variables and one-way ANOVA for continuous variables</td>
<td>The E/IG combined group #4 had lowest incidence of respiratory infections</td>
<td>Study showed a significant difference when health care givers combined education with nasal-airway suctioning *study limitations were many dropped out of study and data reported by caregivers from day care centers</td>
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<td>Citation (Full APA)</td>
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<td>Sullivan-Bolyai, S., Bova, C., &amp; Lee, M. (2012). Development and pilot testing of a parent education intervention for T1DM: PETS-D (Parent education through simulation-Diabetes). <em>NIH Public Access, 38</em>(1), 50-57.</td>
<td>To conduct pilot work on the use of pediatric human patient simulator to teach parents diabetes management for their children newly diagnosed with T1DM referred to as PETS-D (Parent Education thru Simulation-Diabetes)</td>
<td>Leventhal’s self-regulation theory</td>
<td>Focus group study and two pilot studies</td>
<td>*10 subjects’ pilot 1 (8 female 2 male) *16 subjects (13 female, 3 male caregivers) *Health sciences center at the local graduate nursing school</td>
<td>Group 1 pilot: standard hypoglycemia education using vignette and pediatric HPS</td>
<td>*Diabetes Awareness &amp; Reasoning Test-Pets (DART-P)</td>
<td>*Pre/post test pilot study</td>
<td>*Successful recruitment of 16 subjects from only one site within 6 weeks (parents with children diagnosed w/T1D &lt;1 year</td>
<td>*Successful recruitment of 16 subjects from only one site within 6 weeks (parents with children diagnosed w/T1D &lt;1 year</td>
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<td>*6 internally created instruments used to determine effectiveness of education, all of which showed strong reliability (.98,.88,.95,.84,.83,.93)</td>
<td>*mean change from baseline in the predicted direction for all measures; indicating that the simulation education was</td>
<td>*Diabetes Educator using HPS.</td>
<td>Group 2 pilot: Control group standard hypoglycemia diabetes education. Experimental group: same education plus diabetes educator using HPS.</td>
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<td>*complex study method-four step study sequence, with last step being a randomized two group pilot study</td>
<td>*instrument reliability demonstrated for all scales</td>
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<td>*in close coordination time frames</td>
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<td>effective (\text{in increasing knowledge among participants})</td>
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<tr>
<td>Citation (Full APA)</td>
<td>Study Purpose</td>
<td>Conceptual Framework</td>
<td>Design/ Method</td>
<td>Sample/ Setting</td>
<td>Major Variables Studied and their Definitions</td>
<td>Measurement of Major Variables</td>
<td>Data Analysis</td>
<td>Findings</td>
<td>Appraisal: Worth to Practice</td>
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</table>
| Ferguson, N. F., & Estis, J. M. (2018). Training students to evaluate preterm infant feeding safety using a video-recorded patient simulation approach. *American Journal of Speech-Language Pathology (Online)*, 27(2), 566-573. | To determine if brief video recorded patient simulation training increased students’ ability to assess feeding skills in pre-term infants. | None | Randomized control trial | *BSN nursing students (n=52)*  
*Grad level speech pathology students (N=42)*  
*divided into 2 groups (N=51)* didactic training, (N=43) didactic and video simulation  
*conducted at an American university*  
(started w/108 participants 14 later excluded) | *video simulation training versus didactic training*  
*feeding behaviors of preterm infants*  
*infant distress signs* | *Outcomes measured with a 10-question knowledge test, calculated clinical judgment score and documentation accuracy score.*  
*No formal measurement tool* | *Post-test knowledge effect size small (0.054)*  
*post-test clinical judgement effect size med (0.37)*  
*post-test clinical marker effect size large (1.62)* | *Nurses trained with video simulation more accurate in feeding behaviors reporting*  
*infant distress signs documented better* | *Shortage of health care providers and not enough access to correct setting for live simulation training*  
*simulation training is expensive, but video simulation can be as effective for this population of patients* |
<table>
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<tr>
<th>Citation (Full APA)</th>
<th>Study Purpose</th>
<th>Conceptual Framework</th>
<th>Design/Method</th>
<th>Sample/Setting</th>
<th>Major Variables Studied and their Definitions</th>
<th>Measurement of Major Variables</th>
<th>Data Analysis</th>
<th>Findings</th>
<th>Appraisal: Worth to Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sigalet, E., Cheng, A., Donnon, T., Koot, D., Chatfield, J., Robinson, T., Catena, H., &amp; Grant, V. (2014).</td>
<td>To examine the effect of simulation-based seizure management teaching on improving caregiver competence and reported confidence with managing seizures</td>
<td>Mastery learning</td>
<td>Random control trial</td>
<td>61 caregivers of children (&lt;18) recently diagnosed with seizure disorder</td>
<td>*Simulation-based seizure curriculum in conjunction with traditional teaching (IV) *traditional seizure discharge teaching (DV)</td>
<td>KidSIM-ASPIRE Emergent Seizure Management Checklist is a 19-item tool used to evaluate clinician competence in seizure management *pre-medicine *medicine administration *post-medicine</td>
<td>*Paired sample t-tests used to assess difference in pre- and post-test scores. *Independent sample t-tests used to compare both groups on evaluation measures</td>
<td>*post-test recognizing seizure effect size med (0.62) *post-test assess breathing task effect size med (0.65) *post-test place pt in recovery position effect size large (5.0)</td>
<td>Reinforces the need for standardized teaching to include: *initial recognition &amp; care *medication administration *post-medicine care Limitations: *small sample size and unequal groups *incomplete evaluation tool</td>
</tr>
<tr>
<td>Citation (Full APA)</td>
<td>Study Purpose</td>
<td>Conceptual Framework</td>
<td>Design/Method</td>
<td>Sample/Setting</td>
<td>Major Variables Studied and their Definitions</td>
<td>Measurement of Major Variables</td>
<td>Data Analysis</td>
<td>Findings</td>
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</table>
*8-item Likert scale skill survey tool  
*24-item Likert developmental care survey tool | *30 nurses participating  
*conducted at a NYC hospital | *skills competency checklist  
*training survey | *Likert scale pre/post-test with 6 measurable outcomes.  
*Nursing competency checklist  
*post-KMC training survey | Mean change from baseline in the predicted direction for all 6 measures; indicating that the simulation education was effective in increasing knowledge among participants | Nurse competency in infant transport improved from 30% to 93% | Perceived barriers due to confidence level of RN goal to decrease by educating RN utilizing simulation |
## Appendix C: Level of Evidence Table

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>Article #1 Author Year</th>
<th>Article #2 Author Year</th>
<th>Article #3 Author Year</th>
<th>Article #4 Author Year</th>
<th>Article #5 Author Year</th>
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<tbody>
<tr>
<td>I Systematic Reviews Meta-analyses</td>
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<td>II RCT</td>
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<td>Sullivan -Bolyai 2012</td>
<td>Ferguson 2018</td>
<td>Sigalet 2014</td>
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<tr>
<td>III Controlled trial without randomization</td>
<td>Alexandrino 2017</td>
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<td>IV Case control Cohort Studies</td>
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<td>V Systematic Review of Qualitative or Descriptive Studies</td>
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<td>Hendricks-Munoz 2014</td>
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<tr>
<td>VI Qualitative or Descriptive Studies EBP Implementation Projects</td>
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<td>VII Expert Opinion</td>
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Appendix D: Phillips “V” Model

Business Alignment

Start Here
Payoff Needs
5 → ROI Objectives
Impact Objectives
4 → Impact
Impact Objectives
3 → Application Objectives
Application
Learning Objectives
2 → Learning
Learning
Reaction Objectives
1 → Reaction
Reaction
Input Objectives
0 → Input
Input
Input Needs
0

Initial Analysis
Preference Needs
1

Business Alignment and Forecasting
Program

ROI
5

Evaluation
The ROI Methodology

© ROI Institute, Inc.
Appendix E: RN Recruitment Flyer

DNP Pilot Project
Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project
by Brenda Seegmiller, MSN, RN

More information to come—multiple opportunities to help! Training takes place in August 2019. One hour training sessions including simulation and skills. Teaching will stress the importance of temperature management for the preemie.

The objective of the training is to help the parents be more comfortable taking care of their baby; to give them the confidence needed to help while their baby is hospitalized and better prepare them for discharge.
Appendix F: Team Room Sign

**DNP PROJECT**

**Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project**

Brenda Seegmiller, MSN, RN, DNP Student

### Simulation Dates:
- August 13 (1-5 pm)
- August 16 (6-10 pm)
- August 19 (1-5 pm)
- August 22 (6-10 pm)
- August 25 (1-5 pm)
- August 28 (6-10 pm)
- August 31 (1-5 pm)

### Teaching the Families

You are invited to participate in a study involving parents and family members of your NICU babies. Your help is needed to teach the participants about the importance of temperature management and how to safely care for their newborn, be comfortable and prepared for discharge.

### Simulation & Training Topics

All training sessions will be based on temperature management in the premature newborn.

- What happens when baby is cold?
- What happens when baby is hot?
- Tips to help family care for their baby.
- Febrile seizure management

### Training held in the Team Room

The team room will be transformed into a home nursery for the simulations. The debriefs/discussions will be audio recorded for feedback after each session.

### Training in 3 sessions: A, B, C.

Each session will be offered multiple times for the convenience of the participants. We will invite all family members who will be providing care for the infant to attend.

**Simulation provides a hands-on training method for practicing repeatedly in an environment where the patient cannot be harmed.**

*(Traynor, Gallagher, Martin & Smith, 2010)*

**Primary Investigator:**
Brenda Seegmiller
(435.229.9285)

**Call with questions or concerns**

---

**Premature Anne, Human Infant Simulator**


---

**Version 1.0**
Appendix G: Participant Recruitment Flyer

Utilizing Simulation for Parents and Family Members of NICU Infants: A DNP Project

NICU FAMILY MEMBERS
Come participate in a DNP Project!
Simulation is a great hands-on way to learn to care for your baby.
Join us to learn about the importance of managing your baby’s temperature.

Temperature Management

Session A: How to check temperature
Swaddling/dressing baby
Febrile seizures

Session B: Simulation scenarios

Session C: Choking/CPR

**Each session offered several times for your convenience—see attached calendar**

Version 1.0
Appendix H: Demographic Survey

Utilizing Simulation for Family Member Caregivers of NICU Infants:
A Pilot Project
Demographic Survey

Name of Primary Family Contact: ____________________________ (please print)
Phone Number: ____________________________ (to allow for follow up phone call 3-4 weeks post discharge)
Preferred time of day to reach person listed above? (circle one)

Morning       Afternoon       Evening

Please list all family members in attendance:

<table>
<thead>
<tr>
<th>Family Member  (First Name Only)</th>
<th>Relationship to Infant (mother, father, sibling, grandparent, other)</th>
<th>Age</th>
<th>Education (Less than HS diploma, high school, GED, some college, Bachelor’s degree, graduate degree)</th>
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Appendix I: Informed Consent Form

<table>
<thead>
<tr>
<th><strong>Title:</strong></th>
<th>Utilizing Simulation for Family Member Caregivers of Neonatal Intensive Care Unit (NICU) Infants: A Pilot Project</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Location:</strong></td>
<td>Intermountain Healthcare- Dixie Regional Medical Center- River Road Campus</td>
</tr>
<tr>
<td><strong>Principal Investigator:</strong></td>
<td>Brenda Seeegmueller, MSN, RN, DNP Student 435.229.9285</td>
</tr>
<tr>
<td><strong>Co-Investigators:</strong></td>
<td>Dr. Molly Bradshaw, DNP (Eastern Kentucky University, Faculty Advisor) 551.655.9345</td>
</tr>
<tr>
<td><strong>Sponsor:</strong></td>
<td>None.</td>
</tr>
<tr>
<td><strong>When:</strong></td>
<td>August 2019</td>
</tr>
<tr>
<td><strong>Why:</strong></td>
<td>To see if teaching caregivers how to take care of a premature infant using an infant manikin will increase their ability to care for their child safely upon returning home.</td>
</tr>
<tr>
<td><strong>How:</strong></td>
<td>The parents and family members who plan to care for NICU babies will be brought to a classroom for instruction as well as case studies using an infant manikin.</td>
</tr>
</tbody>
</table>
Why is this study being done?
We are asking you to take part in a research study about a parent or family member’s confidence level for taking care of their new premature infant.

This study is being done because taking care of a premature newborn following hospitalization can be difficult. Caregivers may not understand how to care for the infant and may be nervous about their ability to care for the infant. A caregiver’s lack of experience in caring for the premature infant at home may result in the infant being readmitted to the hospital or a delay in recognizing feeding issues.

Approximately 30 people will take part in this study at Dixie Regional Medical Center.

Please read this form and ask any questions you may have before you decide whether to be in this study.

Who can be in the study?
We are asking you to join because you (or your loved ones) have a premature infant in the Neonatal Intensive Care Unit (NICU) who is preparing for discharge.

You can participate in this study if you will be providing care for the newborn when they go home. We are asking all family members who will be providing care at home to participate. Parents, siblings, grandparents, or whomever will be involved is invited to attend the classes.

Who cannot be in the study?
You cannot participate in the class if you will not be responsible for care of the infant at home or if you are younger than 12 years of age.

Do I have to be in the study?
No, you do not have to be in the study. Your decision to take part in this study is completely voluntary.

If you do not want to take part in this study, you will be offered other options, such as standard discharge teaching as normally done in the NICU for parents and family members without being in the study.

How long will I be in the study?
The study will be completed during the months of September-October 2019. You will be invited to attend three one-hour sessions (A/B/C). Each session has different topics. To make sure there is a session that works with your schedule, the classes will be offered seven times during a three-week period. All sessions will be offered as per the attached calendar.

You will be encouraged to attend all three sessions when it is convenient for your schedule. You may also repeat sessions if you prefer. Each session is one hour long, so you would be encouraged to attend a minimum of three hours.
What will happen if I decide to be in the study?
If you should choose to participate in the study, you will be asked to sign this consent, fill in a demographic survey which includes your phone number. During each training session there will be a pre- and post-survey to evaluate your confidence level before and after the training.

During each session, skills will be taught by the NICU nurses, which you will be asked to demonstrate while using a human infant simulator (manikin). The subject of the training is a manikin, not a live infant, so there is minimal risk to participate. These sessions will include an audio recording of the discussions after the training for extraction of information later. The PI will also be taking notes for data collection during the formal discussion period of the training. The audio recordings will not be transcribed, so names will not be identified.

During the second session (B) there will be some role playing. You will be given a scenario to act out. Simulation is a great learning tool for adult learners. Adults prefer hands-on training that is relevant to their world. You will be given the opportunity to hold and take care of a manikin the size of your premature infant. This will hopefully help you feel better about helping with your infant while in the NICU and at home.

After you participate in the training sessions, in approximately 3-4 weeks, the PI will call whoever you list as the point of contact on the demographic survey to ask a few questions. The PI will ask for a preferred time of day to make the call. The phone call will take about 5-10 minutes. The PI will be asking questions regarding whether you or any of your family members who attended the training have had the opportunity to use any of the skills learned, and if you are willing to share any stories from your experiences.

Are there any risks to me if I join the study?
There is minimal to no risk to you or your family members for participating. A human infant simulator (manikin) will be used for the training so a live infant will not be harmed.

Privacy/Confidentiality risks
We will do everything we can to protect your personal information, but there is a chance that a loss of privacy or breach of confidentiality could occur. For more information, see the “How will my health information be used and protected?” section below.

Social/Behavioral study risks
There are no physical risks to you, but you may experience some embarrassment or discomfort. You do not have to answer any questions that make you uncomfortable. Because you may be participating in sessions with others you may not know, the study team will do their best to watch for psychological safety, ensuring a safe environment for learning where everyone will be treated with respect and dignity, no matter the questions or comments.

Will being in the study help me?
Taking part in this study may or may not increase your confidence for taking care of your premature infant(s). While researchers hope the simulation training will prove more effective
than the usual NICU discharge teaching, there have only been a few studies regarding patients and family members participating in simulation training.

What are the costs of taking part in the study?
You will not be charged for any of the study costs.

Will I be paid if I join the study?
You will not be paid for being a part of this study. At the time of admit, when your baby was born, you received an admit package containing reading materials and formula. If you participate, you will receive an additional free package of formula as compensation for your time. It will be donated by the Abbott company, the manufacturer of Similac.

Will the researchers be paid for running this study?
The researchers will not be paid for running this study. The study lead is an employee at Intermountain Healthcare, who is also a student at Eastern Kentucky University completing her doctorate degree in organizational leadership. This is a school study, with no financial support.

What happens if I am injured because I was in the study?
If you become injured while taking part in this study, Intermountain Healthcare can provide medical treatment. We will bill you or your insurance company in the usual way. Because this is a research study, some insurance plans may not pay for your treatment. If you believe you have been injured as a result of being in this study, please call the Principal Investigator right away. You may also contact the Intermountain Institutional Review Board (IRB) at 1-800-321-2107 or IRB@ihs.org.

Will I be given new information?
Sometimes new information becomes available during the course of a study. If this happens, your study team will talk to you about it and you can decide whether you want to continue in the study.

Can I stop being in the study?
Yes. If you join the study, you can decide to stop at any time. If you decide to leave the study, you and your infant will still receive the same care that you would have received without being in the study. Your team can also stop you from taking part in this study at any time if they believe it is in you or your infant's best interest or if the study is stopped.

You can change your mind later and ask us to stop collecting your information. This must be done in writing. You can give this notice to your study team or mail it to:

Brenda Seegmiller, MSN, RN
Dixie Regional Medical Center
544 S. 400 E.
St. George, UT 84770

If this happens, we will not collect new information about you, and you will not be able to continue in the study. However, we will continue to use the information we have already collected.

Who do I ask if I have questions about the study or my rights? If you have questions, concerns, or complaints about this study, you can contact Brenda Seegmiller at 435-229-9285 anytime, day or night.

If you have questions regarding your rights as a research subject or if problems arise which you do not feel you can discuss with the study team, please contact Intermountain’s IRB at 1-800-321-2107 or IRB@email.org.

How will my health information be used and protected? If you decide to take part in this study, you are giving us permission to use your information you share with the team. We will do everything we can to keep your information confidential, but we cannot guarantee this.

The researchers will need to share your information with others who are working on this study. This information will not directly identify you. The others working on this study who may receive that information are the faculty advisor for the PI, Dr. Molly Brashaw at Eastern Kentucky University. She will have access to the results of the study only. She will not have access to the demographic survey with names and phone numbers, just the de-identified information.

We will ask for your name and a point of contact number to reach out to you about the class and its effectiveness. Identifiable information will be removed from the demographics survey at the end of the research. The de-identified information could be used for future presentations or publication in medical journals without additional consent from you. This information could be shared with other researchers at Intermountain Healthcare and Eastern Kentucky University as needed. Only the study team will have access to the information.

Groups outside Intermountain Healthcare may not be required to follow the same laws we follow. They may share your information with others not described in this form. Once Intermountain discloses your information, it cannot guarantee the recipient will not re-disclose your information to a third party.

If you decide to take part in this study and sign this form, you permit researchers to use your information for this study. If you want to take part in this study, please sign the form. If you do not want to participate, please do not sign the form.

Your agreement, also called an authorization, to collect and use your health information for this study will not end. Your un-identified information may be used in future presentations or publications for learning and improvement purposes without additional consent from you.
Consent

I have read and I understand this consent document. I have had the opportunity to ask questions. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected. I will be given a signed copy of the consent and authorization form to keep.

I agree to participate in this research study and authorize you to analyze and publish de-identified information as you have explained in this document.

Participant’s Name (Print)

Participant’s Signature

Date

Name of Person Obtaining Authorization and Consent (Print)

Signature of Person Obtaining Authorization and Consent

Date
Appendix J: Parental Permission Form

Parental Permission Form

What
Utilizing Simulation for Family Member Caregivers of Neonatal Intensive Care Unit (NICU) Infants: A Pilot Project

Where
Dixie Regional Medical Center
1380 E. Medical Center Drive
St. George, UT 94790
(Neonatal Intensive Care Unit (NICU) team room)

Who
PI: Brenda Seegmiller, MSN, RN, DNP Student
     435.229.9285

Co-investigators: Dr. Molly Bradshaw, DNP, Eastern Kentucky University (EKU) Faculty Advisor
                 551.655.9345

Sponsor: None

When
Study will take place during the months of September/October 2019

Why
To see if teaching caregivers how to take care of a premature infant using and infant manikin will increase their ability to care for the child safely upon returning home.

How
The parents and family members who plan to care for NICU babies will be brought to a classroom for instruction as well as case studies using an infant manikin (role play).
Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project

Why is this study being done?
We are asking you to give permission for your child to take part in a research study about helping to provide care for their new premature sibling. This study is being done because sometimes older siblings are asked by their parents to babysit for periods of time. We want your child to be comfortable helping with such a small baby and be confident in their knowledge in the signs and symptoms of distress and know what to do if there are problems.

Why are you asking my child to take part in the study?
We are asking for your child to take part in this study because they have a new, smaller than average baby in their home. Approximately 30 people will take part in this study at Dixie Regional Medical Center.

Please read this form and ask any questions you may have before giving permission for your child to be in this research study.

Who can be in the study?
We want to enroll children, age 12-17, who have siblings in the NICU and are responsible enough to help provide care for the baby.

Who cannot be in the study?
Your child cannot participate in this study if s/he is under the age of 12.

Do I have to give permission for my child to be in the study?
No, you do not have to give permission. The decision for your child to take part in this study is completely voluntary.

What if I decide not to give permission?
You can choose not to give permission for your child to take part in the study. It is up to your discretion if they can fully participate and are responsible enough to participate.

Can I change my mind later?
Yes. If you decide to give permission for your child to join the study, you can change your mind and decide to stop at any time.

How do I stop if I do not want my child to be in the study any longer?
Please tell the study lead, Brenda Seegmiller, if you are thinking about stopping or if you decide to stop.

The study lead can also stop your child from taking part in this study any time if he or she believes it is in your child’s best interest to stop or if the study is stopped.

You can ask us to stop collecting your child’s information, though we will still be able to use the information we have already collected. This must be done in writing. You can give this notice to the Principal Investigator or research team in person or mail it to:

Intermountain Healthcare IRB
IRB NUMBER: 1051178
IRB APPROVAL DATE: 05/05/2019
Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project

Brenda Seegmiller, MSN, RN
544 S. 400 E.
St. George, UT 84770

If you change your mind, we will stop collecting your child’s information. Your child will not be able to continue in the study. We can use the information we have already collected. Your child will be able to join the study again at a later date. If you decide to leave the study, your child will still receive the same care that you would have received without being in the study.

How long will my child be in the study?
Your child will be in the study for whatever time you allow. We encourage the baby’s siblings to attend all three sessions. Each session is offered several times for your convenience, lasting an hour each. You will need to Dixie Regional Medical Center three times. Each visit will take about one hour. See attached calendar schedule with dates and times of each session.

What will happen if I decide to let me child take part?
Your child will participate right along with you, taking part in the classroom learning as well as the simulation role play activities.

During the training, there will be formal discussions to conclude the trainings. The study lead will be taking notes as well as audio recording the session for data extraction later. The audio recording will not be transcribed, so will remain unidentifiable. The study lead will ask for a point of contact number on the demographic survey, so they can call one person in the family who participated. The study lead will make the phone call for the follow up survey 3-4 weeks after you take your infant home. The survey will last 5-10 minutes. The study lead will check and confirm the best time of day to call while completing the consent process.

What are the risks to my child if s/he is the study?
The known risks and side effects are minimal to none. The risks may include a breach in confidentiality, although the study team will do their best to protect all identifiable information.

Are there any benefits to my child if s/he takes part in the study?
- Your child may be more confident when it comes to holding their premature sibling
- Your child may learn what to watch for and how to help if there is a problem

Will I be updated about new information or developments?
As the study progresses, the study lead will talk to you about any new information or developments that may increase your child’s risk. At that time, you can decide whether to continue with the study or not.

What happens if my child is injured because s/he was in the study?
If your child becomes injured while taking part in this study, Intermountain Healthcare can provide medical treatment. We will bill you or your insurance company in the usual way. Because this is a research study, some insurance plans may not pay for your treatment. If you
Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project

believe your child has been injured as a result of being in this study, please call the Principal Investigator right away, Brenda Seegmiller (435.229.9285). You may also call the Office of Research at 1-800-321-2107.

Who do I ask if I have questions about the study or my child’s rights? Brenda Seegmiller, study lead, may have information about the research or related matters. Please contact her at 435.229.9285 day or night. If she does not have an answer, she will get one for you from her resources.

If you have questions regarding your child’s rights as a research subject or if problems arise which you do not feel you can discuss with the Investigator, please contact Intermountain’s Office of Research at 1-800-321-2107.

What are the costs of taking part in the study? There is no cost for participation in this study.

Will my child be paid to take part in the study? Your child will not be paid for being in this research study.

If my child takes part in this study, what health information about him/her will you use? The only personal health information requested for this study is your child’s name. No other health information is necessary for participation. The identifiable information will be stored under lock and key and destroyed later per policy.

The unidentifiable information gathered may need to be shared with the study lead’s faculty advisor. If you decide to let your child take part in this study, you are giving us permission to use the information shared with the study team. We will do everything we can to keep your information confidential, but we cannot guarantee this. The unidentifiable information collected may be used for future presentations and/or published in a medical journal without additional consent, thus it’s use will be ongoing.

Groups outside Intermountain Healthcare may not be required to follow the same laws we follow. They may share your information with others not described in this form. Once Intermountain discloses your information, it cannot guarantee the recipient will not re-disclose your information to a third party.

If you decide to allow your child to participate in this study and sign this form, you permit researchers to use your information in the study. If you do not allow your child to participate in the study, do not sign the form.
Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project

Consent
I confirm that I have read and understand this consent and authorization document and have had the opportunity to ask questions. I understand that my child's participation is voluntary and that I am free to withdraw my child at any time, without giving any reason, without my medical care or legal rights being affected.

I agree to allow my child to participate in this research study as you have explained in this document.

________________________
Child's Name

________________________
Parent/Guardian Signature

________________________
Name of Person Obtaining Authorization and Consent

________________________
Signature of Person Obtaining Authorization and Consent

________________________
Date
## Appendix K: Child Assent Form

### Assent Form

<table>
<thead>
<tr>
<th>What</th>
<th>Utilizing Simulation for Family Member Caregivers of Neonatal Intensive Care Infants: A Pilot Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Where</td>
<td>Dixie Regional Medical Center 1380 E. Medical Center Drive St. George, UT 84790 (Neonatal Intensive Care Unit (NICU) team room)</td>
</tr>
<tr>
<td>Who</td>
<td>Project Lead: Brenda Seegmiller, MSN, RN, DNP Student 435.229.9285 Co-investigators: Dr. Molly Bradshaw, DNP Faculty Advisor 551.655.9345 Sponsor: None</td>
</tr>
<tr>
<td>When</td>
<td>August 2019</td>
</tr>
<tr>
<td>Why</td>
<td>To see if teaching caregivers how to take care of a premature infant using and infant manikin will increase their ability to care for the child safely upon returning home.</td>
</tr>
<tr>
<td>How</td>
<td>The parents and family members who plan to care for NICU babies will be brought to a classroom for instruction as well as case studies using an infant manikin (role play).</td>
</tr>
</tbody>
</table>
SIMULATION FOR FAMILY MEMBERS

Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project

What is a research study?
A research study is a way to find out new information about something. You do not need to be in a research study if you do not want to.

Why are you asking me to be in this research study?
We are asking you to take part in this research study because we want to learn more about teaching kids to help take care of their new baby brother/sister using a learning method called simulation. It is a sort of role play; acting out scenarios when given a story.

Do my parents/guardian know about this study?
Yes. We have explained the study to your parents/guardian, and they said that we could ask you if you want to be in this research study. Please talk this over with your parents before you decide whether or not you want to be in the study. We ask you to come with a parent or adult over the age of 18, so you will not be alone during the training.

We also ask your parents to give their permission for you to take part in this study. But even if you parents say “yes” you can still decide not to do this.

Do I have to be in the study?
No, you do not have to be in this study. Being in this study is completely voluntary and no one will be upset if you don’t want to be in the study.

What will happen if I decide I want to be in the study?
If you agree to be in this study, you will come with a parent/adult to a classroom near the NICU where your baby will be. We will have you learning skills along with your other family members. You will be taught how to safely hold the baby and make sure the baby is okay.

Can I get hurt if I join the study?
There is minimal to no risk to you while being a part of the study. If you decide to take part in this study, you are giving us permission to use your information you share with the study team. We will do everything we can to keep your information confidential, but we cannot guarantee this.

Could this research study help me?
This study can help you. We hope it will make you more comfortable while helping to take care of your new baby when he/she gets to go home.

Can I stop being in the study if I change my mind later?
Being in this study is up to you and no one will be upset if you change your mind later and want to stop.

Who will see the information you collect about me?
There will be no need to access any of your personal medical records. The survey with your name is the only personal information we will request. You do not need to put your name or phone number, but I would ask you to fill out the rest of the information. No one besides the study team will have access to this information. This information may be sent to the faculty instructor of the primary investigator, but they will not even know your name. All information will be unidentifiable.
Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project

What if I have questions?
You can ask me, Brenda Seegmiller, any questions you have about the study. If you have a question later you didn’t think of now, you can call me at 435.229.9285 or ask me next time we meet.

You can take more time to think about being in the study and talk more with your parents or guardian about it. If you want to be in this research study, please write your name on the ‘participant’ lines below after we have finished talking about this.

- Remember, you can change your mind and stop being part of this study at any time
- You and your parents will be given a copy of this paper to keep

Name of participant (Please Print)

Participant signature ___________________________ Date ___________________________

Name of witness (Please Print)

Witness Signature ___________________________ Date ___________________________
Appendix L: Stable Baby Scenario

**Stable Baby**

**Simulation Scenario:**

**Objectives: At the end of the simulation session, family caregivers will be able to:**

1. Recognize cues from fussy baby
2. Demonstrate troubleshooting fussy baby (check diaper, feed baby, and check temperature)
3. Demonstrate taking baby’s axillary temperature
4. Demonstrate safely swaddling baby

**Scenario Overview:**

3-month old infant (born at 28 weeks gestation) is now at home. Discharged yesterday from NICU after 3 months stay. Baby has been fed but is now slightly fussy/wiggly. Needs to have diaper changed and be swaddled.

**Patient report:**

You have just finished feeding your baby and it is becoming fussier, starting to cry.

**Scenario set-up:**

- Props: crib (with bedding), rocking chair
- Additional equipment/supplies: swaddle blanket, diaper
- Manikin: Premature Anne
- Manikin moulage: messy diaper
- No medications
- Patient scripts:
  - Baby crying
- Confederate scripts:
  - None

**Additional information upon request:** (this could be provided prior to the scenario if questioned further or as incoming information during the scenario)

*Baby was on room air and doing great at time of discharge. She was eating great and had no problems sucking.*

**Debriefing Points:** *(along with other things, make sure these are covered)*

- What cues is baby demonstrating?
- What are some things you can check?
- Ideas for soothing/comforting baby.
Current State: *(the beginning of the scenario)*
1. Baby crying
2. Cool to touch
3. Messy diaper

Interventions: *(caregiver should do these)*
1. Change baby’s diaper
2. Check temperature
3. Swaddle baby in blanket provided

After interventions complete:
1. Baby content
2. Sucking on pacifier
Appendix M: Baby with Temperature Scenario

Baby with Fever

Simulation Scenario:

Objectives: At the end of the simulation session, participants will be able to:

1. Recognize and respond to baby’s cues
2. Demonstrate taking baby’s axillary temperature
3. Verbalize actions for increased temperature
4. Demonstrate how to care for baby with seizure
5. Verbalize signs/symptoms for consulting PCP/Instacare/ED

Scenario Overview:

3-month old infant born at 28 weeks gestation is now at home. Baby is unusually fussy, feels warm and doesn’t act interested in eating. Upon checking baby’s temperature, they should recognize a fever of 102.0*. Caregivers will notify physician and watch carefully and monitor for seizure.

Patient Report:

You have been home with your baby now for 2 days. You have kept them swaddled, but now their face is slightly flushed, and they feel “warm”. The baby doesn’t seem interested in eating at this time.

Scenario Set-up:

- Room type: home nursery
- Props: crib (with bedding), rocking chair
- Additional equipment/supplies: axillary thermometer, baby bottle w/formula, wash cloth, baby blanket
- Manikin: premature Anne
- Manikin moulage:
  - Flushed cheeks
  - Swaddled in blanket
  - “warm” skin
- No medications
- Patient scripts:
  - Baby moans slightly, mostly quiet
- Confederate scripts: Provider
  - Walk parent through managing baby’s fever if they call the provider
o Remove blankets
o Keep baby hydrated with fluids

Additional information upon request (this could be provided prior to the scenario if questioned further or as incoming information during the scenario)

Baby was on room air and doing great at time of discharge. She was eating well and had no problems sucking.

Debriefing Points: (along with other things, make sure these are covered)

• Checking temperature
• How is baby eating or drinking?
• At what point do you call PCP/Instacare/ED

Current State: (beginning of the scenario)

1. Baby warm/hot to touch
2. Face flushed
3. Slow to cry
4. Not interested in eating

Second State: (recognition of seizure)

1. Baby warm/hot
2. Face still flushed
3. Seizing

After taking baby temperature: (hopefully the caregiver will do these things)

1. Keep baby safe during seizure
2. Have family member call provider
3. Administer meds as prescribed by provider
4. Cool wash cloth
5. Unwrap from swaddle
Appendix N: Pre-Training Survey

Utilizing Simulation for Family Member Caregivers of NICU Infants:
A Pilot Project
Pre-Training Checklist

Date: _____________________
Session: ___________________

Before completing the simulation training, please take a few minutes and tell us how comfortable you are carrying out these core activities for your baby.

Circle the appropriate corresponding number:
1: very uncomfortable
2: slightly uncomfortable
3: neutral
4: slightly comfortable
5: very comfortable

<table>
<thead>
<tr>
<th>Skill</th>
<th>Confidence Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Core Activities:</strong></td>
<td></td>
</tr>
<tr>
<td>Proper handwashing</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Checking axillary temperature</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Changing infant’s diaper</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td><strong>Hygiene Core Activities:</strong></td>
<td></td>
</tr>
<tr>
<td>Changing infant’s clothes</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td><strong>Positioning and Comfort Care Core Activities:</strong></td>
<td></td>
</tr>
<tr>
<td>Swaddling infant</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Cooling infant</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>

Version 1.0
Appendix O: Skills Checklist

Utilizing Simulation for Family Member Caregivers of NICU Infants:
A Pilot Project
Skill Checklist {Partners in Healing}

Name: ____________________________    Date: ____________________________

At the completion of the training, check the appropriate boxes and give to the parent or family member. This report will be given to the nurses at the bedside.

<table>
<thead>
<tr>
<th>Skill Passed</th>
<th>Needs reinforcing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

**Basic Core Activities:**

- Checking axillary temperature
- Changing infant’s diaper

**Hygiene Core Activities:**

- Changing infant’s clothes

**Positioning and Comfort Care Core Activities:**

- Swaddling infant
- Cooling infant

Version 1.0
Appendix P: Post-Training Survey

Utilizing Simulation for Family Member Caregivers of NICU Infants:  
A Pilot Project  
Post-Training Checklist

Date: _____________________  
Session: ___________________

Please take a few minutes and tell us how comfortable you are carrying out these core activities for your baby after having completed the training.

Circle the appropriate corresponding number:  
1: very uncomfortable  
2: slightly uncomfortable  
3: neutral  
4: slightly comfortable  
5: very comfortable

<table>
<thead>
<tr>
<th>Skill</th>
<th>Confidence Level</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Basic Core Activities:</strong></td>
<td></td>
</tr>
<tr>
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</tr>
<tr>
<td>Changing infant’s diaper</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td><strong>Hygiene Core Activities:</strong></td>
<td></td>
</tr>
<tr>
<td>Changing infant’s clothes</td>
<td>1 2 3 4 5</td>
</tr>
</tbody>
</table>
| **Positioning and Comfort Care Core Activities:** | |}

Version 1.0
Appendix Q: Post-Simulation Impact Survey

Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project

Post-Simulation Impact Survey Questions
(to be completed by the project lead 2-4 weeks post discharge)

Family of Baby: _________________________________________
Name (of person being interviewed): __________________________________________
Relationship to Baby: _____________________________________________
Date: ________________________________________________________________

1. What skills have you utilized as a result of the simulation training?

2. What was your favorite part of the simulation training?
   a. What was most helpful?

   b. What would be more helpful?

3. How confident did you feel to go home with your baby?
   a. Extremely
   b. Very
   c. Somewhat
   d. Slightly
   e. Not at all

4. What percentage of your confidence do you attribute to the simulation training?
   {0-100} _____________

5. Questions or Comments:
   ___________________________________________________________________
   ___________________________________________________________________

Version 1.0
Appendix R: Staff Post-Training Survey

Please take a few minutes to complete this short survey regarding the family members of the infants in your NICU.

Recently the family members of your NICU infants may have participated in a pilot project including simulation as part of their education and discharge teaching. Please select the response below that best corresponds to your opinion regarding the effectiveness of the training for those who participated.

1. As a staff member in the NICU, I interact with families of the infants.
   a. Always
   b. Frequently
   c. Sometimes
   d. Rarely
   e. Never
2. I donated my time to assist with the teaching during the simulation pilot project.
   a. Yes
   b. No
3. I feel like the training for the family members was beneficial for them.
   a. Yes
   b. No
4. I noticed the family members became more active members of their infants’ care team after they participated in the simulation training.
   a. Always
   b. Frequently
   c. Sometimes
   d. Rarely
   e. Never
5. I feel like the confidence and competence level of the family members improved after they completed the simulation training.
   a. Always
   b. Frequently
   c. Sometimes
   d. Rarely
   e. Never
6. I recommend the pilot project be considered for implementation throughout the NICU’s in the system.
   a. Yes
   b. No
7. Suggestions for improving the process if implemented:

______________________________

Version 1.0
Appendix S: Student Satisfaction & Self-Confidence in Learning Tool

Student Satisfaction and Self-Confidence in Learning

Instructions: This questionnaire is a series of statements about your personal attitudes about the instruction you receive during your simulation activity. Each item represents a statement about your attitude toward your satisfaction with learning and self-confidence in obtaining the instruction you need. There are no right or wrong answers. You will probably agree with some of the statements and disagree with others. Please indicate your own personal feelings about each statement below by marking the numbers that best describe your attitude or beliefs. Please be truthful and describe your attitude as it really is, not what you would like for it to be. This is anonymous with the results being compiled as a group, not individually.

Mark:
1 = STRONGLY DISAGREE with the statement
2 = DISAGREE with the statement
3 = UNDECIDED - you neither agree or disagree with the statement
4 = AGREE with the statement
5 = STRONGLY AGREE with the statement

<table>
<thead>
<tr>
<th>Satisfaction with Current Learning</th>
<th>SD</th>
<th>D</th>
<th>UN</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The teaching methods used in this simulation were helpful and effective.</td>
<td></td>
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<tr>
<td>2. The simulation provided me with a variety of learning materials and activities to promote my learning the medical surgical curriculum.</td>
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<tr>
<td>3. I enjoyed how my instructor taught the simulation.</td>
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<tr>
<td>4. The teaching materials used in this simulation were motivating and helped me to learn.</td>
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<tr>
<td>5. The way my instructor(s) taught the simulation was suitable to the way I learn.</td>
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</table>

<table>
<thead>
<tr>
<th>Self-confidence in Learning</th>
<th>SD</th>
<th>D</th>
<th>UN</th>
<th>A</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. I am confident that I am mastering the content of the simulation activity that my instructors presented to me.</td>
<td></td>
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<tr>
<td>7. I am confident that this simulation covered critical content necessary for the mastery of medical surgical curriculum.</td>
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<tr>
<td>8. I am confident that I am developing the skills and obtaining the required knowledge from this simulation to perform necessary tasks in a clinical setting</td>
<td></td>
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<tr>
<td>9. My instructors used helpful resources to teach the simulation.</td>
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<tr>
<td>10. It is my responsibility as the student to learn what I need to know from this simulation activity.</td>
<td></td>
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</tr>
<tr>
<td>11. I know how to get help when I do not understand the concepts covered in the simulation.</td>
<td></td>
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<tr>
<td>12. I know how to use simulation activities to learn critical aspects of these skills.</td>
<td></td>
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</tr>
<tr>
<td>13. It is the instructor's responsibility to tell me what I need to learn of the simulation activity content during class time.</td>
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</tbody>
</table>

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Revised December 22, 2004
Appendix T: Certificate of Completion

Utilizing Simulation for Family Member Caregivers of Neonatal Intensive Care (NICU) Infants: A Pilot Project

Certificate of Achievement

THIS ACKNOWLEDGES THAT

Family member name

HAS SUCCESSFULLY COMPLETED SKILLS AND SIMULATION TRAINING SESSION _______ FOR A DNP PROJECT

BRENDA SEEYMILLER, DNP STUDENT

AUGUST 2019

Version 1.0
Appendix U: Simulation Calendar Schedule

**Utilizing Simulation for Family Member Caregivers of NICU Infants: A Pilot Project**

1-5 p.m. (a) 1-2 p.m.  b) 2:30-3:30 p.m.  c) 4-5 p.m.)

6-10 p.m. (a) 6-7 p.m.  b) 7:30-8:30 p.m.  c) 9-10 p.m.)

<table>
<thead>
<tr>
<th>Sunday</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
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</thead>
<tbody>
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<td>18</td>
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<td>21</td>
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<td>23</td>
<td>24</td>
<td>25</td>
<td>26</td>
<td>27</td>
</tr>
<tr>
<td>1-5 p.m.</td>
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<td>NICU Family Sims</td>
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<td>30</td>
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<td>1-5 p.m.</td>
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</tr>
<tr>
<td><strong>OCTOBER</strong></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
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</tr>
<tr>
<td>NICU Family Sims</td>
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<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
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<tr>
<td>1-5 p.m.</td>
<td>NICU Family Sims</td>
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<tr>
<td>NICU Family Sims</td>
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<td>12</td>
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<tr>
<td>6-10 p.m.</td>
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</tbody>
</table>

**Each session [A, B, C] offered each day for your convenience. All sessions do NOT have to be completed the same day. See times above**

Version 2.0
### Appendix V: Demographic Survey Results

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
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## Appendix W: Pre- and Post-Training Checklist Results

### Paired Samples Test (Pre- and Post-Training)

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