

Increasing NICU Nurses' Knowledge on Early-Start Breastfeeding Initiatives for Infants Less
Than 33 Weeks

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Breastfeeding educational interventions have been shown to improve Neonatal Intensive Care Unit nurse's knowledge and attitudes toward breastfeeding, thereby fostering a more supportive atmosphere for lactation. The purpose of this research is to enhance NICU nurses' knowledge about early-start breastfeeding for infants considered preterm in a level III academic health NICU. Breast Milk is the gold standard of nourishment for the growth and development of the neonate (American Academy of Pediatrics, [AAP], 2012). This research aims to empower families of NICU infants to begin breastfeeding as soon as they are medically able. Hence, both mom and baby are able to receive the full benefits.

Evidence supports that exclusive breastfeeding for the first six months of the infant's life provides extensive immunological support (Benoit & Semenic, 2014). While breastfeeding earlier than 32 weeks gestational age is not standard in many NICUs across the United States, there is significant evidence that some infants may be medically ready to breastfeed and physically able to prior to 32 weeks. An article published in the American Academy of Pediatrics journal found that resting energy expenditures in breastfeeding preterm infants were very similar to preterm infants that were bottle-feeding before 32 weeks (Berger et al., 2009). They concluded that allowing infants to feed at the breast as soon as they can tolerate feedings by mouth would not jeopardize energy balance and have manifold nutritional, physiologic, and emotional benefits (Berger et al., 2009).

Literature searches were conducted to find evidence to support our research question. These searches were done through the University of Cincinnati's health sciences library resources. The databases used were EBSCOhost, PubMed, and Cinahl, with the keywords being "breastfeeding," "preterm," "NICU," and "early-start breastfeeding." These keywords were combined using the boolean operator "AND," with secondary keywords being "nursing

education," "benefits," "barriers," and "discharge." The limits that were applied were English language, full text available and published within the last seven years. One article yielded was beyond the seven-year requirement; however, permission was given due to its high-quality evidence and rigorous methods.

After spending clinical time in the University of Cincinnati NICU, it was apparent that there were barriers in the ability of the staff to ensure breastfeeding was occurring during the neonate's stay on the unit. Due to COVID-19, there were strict visitor policies in place allowing only one person to visit the infant at a time during specified visitation hours. This barrier and increased familial stress make it extremely difficult for infants to be strictly breastfed in the NICU. After contacting the NICU nurses and lactation consultants on this unit, research was done regarding the educational materials that were currently being used to teach their staff. Within these PowerPoint slides, it was apparent that there was a gap somewhere within the unit preventing a considerable number of patients from being breastfed during their stay. It was shown that the University of Cincinnati NICU had the most room for improvement with their discharge breastfeeding rates. Regional data provided to us by the UCMC NICU showed that their unit has the lowest rates of very low birth weight infants being discharged on any human milk compared to units both Cincinnati and Ohio-wide. Knowing the vast benefits of breastmilk, especially for infants at risk for poor health outcomes, we were presented with a potential knowledge gap which is the basis for this capstone project.

After researching the potential barriers for early-start breastfeeding initiation in the NICU, three essential themes became apparent to guide our project and interventions. First, being aware of the appropriate ways to educate mothers of infants in the NICU with multiple learning styles is extremely pertinent at the individual's learning level. In an effort to present

breastfeeding education in a way that benefits mothers from all backgrounds, we made our educational materials as uncomplicated and straightforward as possible. Two of our articles discussed the need for breastfeeding techniques to be taught directly and straightforward. In a research article using a randomized control trial that included 83 participants in a clinical setting, participants were split into three different control groups that all received breastfeeding education through different visual aids. The results of this article concluded that focusing on one specific subject and presenting information in the most simplified way possible promotes better health outcomes and patient understanding (Mackert, et. al., 2016). Our research also showed that primiparous women hold the largest knowledge gap. More time will need to be spent with this population outlining the benefits of breastfeeding and different techniques that can be used. An additional knowledge gap lies with women of lower education levels, in which they may need additional teaching styles or resources such as apps, figures, or websites for additional support (Jasny, et al., 2019). In an effort to help close this knowledge gap, we developed tools that would allow NICU nurses to reference information that quickly establishes the mother's current understanding of breastfeeding practices and allows the nurse to spend more one-on-one time with her and the infant for patient education.

Second, nurses should conduct an assessment upon admission for all of the possible barriers of early-initiation breastfeeding. Many barriers are present that can inhibit a mom's inclination to breastfeeding, especially when their child is still in the hospital. One of the main barriers that we focused on was the lack of awareness that NICU nurses may have surrounding these barriers for mothers. Nurses not having adequate knowledge in their specialty can make them anxious, uncomfortable, and frustrated, which takes away from the quality of care provided. Hospitals do not always re-evaluate or implement education in a consistent manner, so

it can be easy to forget policies or not continue them in practice. Another important barrier to early-start breastfeeding is the mother's knowledge of breastfeeding. First-time mothers have never breastfed and may be unaware of the process. Even multiparous mothers may face a new latching issue or have further concerns that they did not experience with their previous child. Making sure mothers are appropriately educated is critical in delivering breastfeeding techniques. The first step to overcoming this is having a comfortably educated staff equipped to handle unique patient concerns and awareness of barriers they may face.

Third, the availability of appropriate resources to achieve successful early-initiation breastfeeding and prolonged breastfeeding at discharge is crucial. Examples of resources can include the physical equipment such as breastfeeding pumps, bottles, hand pumps, but also consists of the staff directing the patient's care. Having an educated staff on the same page regarding the importance of early-start breastfeeding initiation is very relevant to the patient's health outcomes after discharge. In a quality improvement article by Bixby et al. (2016), the effects of increased education by the entire multidisciplinary team were studied in Orange County, California. One of the interventions conducted was used to educate the bedside nurses by creating mandatory online lactation education modules with three didactic modules to choose from. In addition to this, they state, "A NICU RN Lactation Resource team was identified with the goal of having bedside staff with additional lactation training to assist their peers due to the limited IBCLC resources" (Bixby et al., 2016). After implementing educational sessions of the multidisciplinary team, this NICU saw a 36% increase in breastmilk continuation at discharge (Bixby, et al., 2016). Utilizing a group of nurses with even more lactation education as a resource on each shift could ensure that moms with barriers can successfully use early-start breastfeeding in the NICU. If this could be implemented in NICUs within Ohio, specifically UCMC, there

would be potential for a rise in early-start breastfeeding initiation rates and also breastfeeding after discharge for NICU infants.

To increase NICU nurse's knowledge of breastfeeding benefits and encourage compliance of patients to progress towards early-start breastfeeding, our capstone group held an educational session. The educational session was held via Zoom on Monday, March 22, 2021, with an attendance of 8 nurses, 2 PT/OTs, and one lactation consultant. At the beginning of the Zoom meeting, we had our participants complete a pre-test survey to assess how likely NICU nurses were to educate patients and how comfortable they felt while doing so. Following the pre-test, our group refreshed the NICU nurses on current practice guidelines for early-start breastfeeding and provided educational tools and resources. The tools introduced were a breastfeeding initiation flowchart and a "badge buddy" that described the breastfeeding pathway. Our main objective with these tools was to provide nurses with a quick resource at the bedside that could be used when assessing a NICU family on their education level and readiness to begin the breastfeeding pathway. After the education session, we had our audience fill out a post-test survey with the same questions on the pre-test survey. The post-test survey allowed us to determine our intervention's success and evaluate if they felt more likely to educate patients on early start breastfeeding after receiving education.

To gather information and collect our results, we conducted a pre and post-test survey and provided QR codes for the participants to access within the PowerPoint. The pre-test survey consisted of six questions, five of which were answered on a 4-point scale of never, rarely, often, and always as well as no, minimal, moderate, and excellent. The sixth question was an extended response asking them to provide any barriers they saw in their practice when implementing early-start breastfeeding in the NICU. The majority of the questions aimed to determine the

nurse's current knowledge of the breastfeeding pathway in the NICU, how often they utilize the breastfeeding pathway cards at the bedside, and how comfortable they felt while educating mothers on early start breastfeeding. Completing the pre-test survey allowed us to determine the nurse's current knowledge and views before our presentation. It provided us with a baseline to compare our post-teaching results against.

The post-test survey consisted of seven questions, six questions with the same 4-point scale as the pre-test, and one extended response. The six, 4-point scale questions asked about the nurses' current knowledge of the breastfeeding pathway in the NICU, how likely they are to change their current breastfeeding teaching practices after this presentation, how likely they are to reference our badge buddy and linear flowchart, how informed they feel about early-start breastfeeding initiative protocols, how comfortable they feel about educating mothers, and how often they feel their patients use these principles. The post-test survey extended response asked the nurses to further provide us with any suggestions to improve UCMC's NICU. The post-test survey results allowed us to determine if our presentation resulted in an increase in the nurses' knowledge and if the tools we provided would be implemented in their practice.

We received 11 responses on both our pre-test and post-test, which allowed us to do data analysis on the effectiveness of our intervention. When comparing the results of our pre-test and post-test surveys, we found that 72.7% of the nurses submitted that they felt they only had a moderate amount of knowledge of the breastfeeding pathway. After our presentation, 81.8% of the nurses submitted that they have excellent knowledge of the breastfeeding pathway. This significant increase in data showed us that our presentation was successful in educating the NICU nurses. An unexpected finding from our pre-test data showed that 81.8% of the 11 nurses stated that they never utilize the breastfeeding pathway cards at the bedside. This result was

surprising to us because the lactation team in the NICU informed us that these pathway cards are supposed to be used at the bedside with each patient as the primary educational method for the family and as a way to align the team to the family's progress towards breastfeeding. This also showed that a recommendation for a change of practice was needed.

Following the delivery of our presentation, our post-test survey showed that 63.6% of the nurses agreed that our badge buddy and linear flow chart would be helpful and that they could see themselves "always utilizing in practice." Our post-test survey's extended response asked if there were any feedback or recommendations after the information discussed in our presentation. The majority of the responses were regarding how a badge buddy and linear flowchart would be beneficial to this NICU. These findings were significant to us, showing that our recommended tools would help ensure that patient teaching is kept on track.

While our presentation was beneficial to the nurses in the NICU, it also showed us some areas where future changes and recommendations could be implemented. If repeated, our project would help more mothers if we incorporated the entire multidisciplinary team in the process. Nurses spend a significant amount of time with the mothers, but they are also taught by the team of physicians, physical and occupational therapy, and lactation consultants. The entire team could benefit from our badge buddies and flow charts of the breastfeeding pathway just as much as the nurses can. The whole team also needs to be sure that they are regularly reviewing the latest data and evidence-based practice regarding early-initiated breastfeeding.

We recognize that there are certain elements that would have helped our group generate more evidence, with the most notable being a longer time frame in order also to gain evidence from the mother's before and after opinions of the breastfeeding teaching. Our group would have also benefited both by being in person to present our project and also by having a larger sample

size. While we presented to all the nurses available during the shift, only eleven of them filled out the pre and post-tests. A larger sample size would have helped show us how beneficial the presentation and visual aids would have been. In the future, it would be helpful for the presentation to be in person in order for us to answer questions and to further engage with the group during the session.

In conclusion, our capstone project was able to make an educational impact. Although being online and having to present our project virtually had its limitations and challenges, we believe we were able to increase knowledge where it was lacking. Early start breastfeeding offers many positive outcomes for the infant and mother. Breastfeeding is a critical part of an infant's life that should be educated and implemented correctly. Not only do some mothers feel uncomfortable and uneducated on breastfeeding, but some NICU nurses also do as well. Our results showed that 72% of nurses thought that they only had moderate knowledge of their current breastfeeding pathway. Through our research of UCMC's policies, there were some evident gaps in protocol implementation. Hospitals should be incorporating different educational interventions and re-evaluating if they are reaching the bedside. We believe the tools that we created during our capstone project would be a valuable asset to nurses in the NICU. Our results did show about 65% of the nurses would change their practice after receiving our information. Using the tools we developed would not only make the nurses more comfortable, but it would give them the necessary information to educate mothers on early-start breastfeeding leading to healthier outcomes for their child.

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Appendix A:**Emily:**

Through this project, I have learned a lot about what it takes to build an entire research-based project like this with the hopes of change in practice. Acquiring evidence is something we have all done, even before college, so gathering data has become very comfortable to me. However, gathering data for a project that is capable of showing evidence for potential change that you can also implement was very different to look for. In the beginning, it was really easy to find articles and develop our PICOT question, but we realized we were not nearly as specific as we needed to be to succeed in making a change in the UCMC NICU. After tweaking our research question, we were able to make bigger leaps at knocking out our project. Our capstone project also taught me about how hard it can be to gather data and make it mean something in order to facilitate change and make recommendations for future practice, especially when our teaching intervention had to be done virtually. One lactation consultant shared a phone with 11 nurses, and it was extremely difficult to gather their responses from our pre-test and post-test surveys. Overall, this project made it apparent that while it can be easy to state that practice changes are necessary, it is much harder to develop than I had thought. However, I am glad that I put my foot in the door for how to potentially make a difference at my future jobs and nursing practice.

Kennedy:

This project has given me a glance into the formal aspects of undergraduate research. I have always been keen on research projects and I gravitate towards this type of work naturally, so I found it really nice to get this insight in our capstone project. There were definitely

challenges that came with this project, senior year is pretty hectic and has a lot of time commitments with having to get all of our co-op and role transition hours. I found this kind of tough to navigate in the beginning of the semester as I juggled coming back to school after the holiday but looking back I am content with the final product between the paper and scholarly poster. After developing our PICOT questions and gathering preliminary evidence, we had to shift our entire focus and make more attainable goals with the help of our research advisor which threw our timeline off a bit. However, I think that we were able to culminate existing data and our own experiences following OB and NICU clinical rotations that could lead to real practice changes. It was really cool to see that the gaps we had read about existed in the environments where we had gained experience in and from that, we were able to develop more realistic tools to make nurse's hectic days a bit easier. Although there would be huge hurdles to get over before our research could become an actual change in practice, it was inspiring to see that we as degree-less students have the potential to make those impacts with our capstone. This project has allowed me to frame my goals for incorporating research into my career and this experience will help me to be more knowledgeable about what it requires in the future.

Ashley:

Prior to working on this project, I knew very little on the facts and benefits of early start breastfeeding. When researching some of our evidence we contacted therapy and the lactation consultants to get extra information on UCMC's system of breastfeeding in their NICU. I enjoyed this because it showed me how easy and beneficial working as a multidisciplinary team can be. I am currently about to start working in the Clinical Decision Unit in the emergency department at UCMC. In this role I am sure that I will run into some new mothers where the

content from this project will apply. However, after a couple of years I am hoping to transfer to a NICU somewhere and I will definitely be excited to work with them on the breastfeeding pathways to early start breastfeeding and share all the knowledge with them that I can. This project has also shown me that researching and speaking to professionals in the field of something I am unsure about can be very rewarding. If there is a topic in the future that I would like to study more, I feel like this project has given me a good basis and framework for where to start and how to conduct my research study on it. I wish this semester could have been in person for the project but all in all I feel like everything worked out well.

Sierra:

I have learned so much throughout the entire capstone project, not only regarding our topic we chose. This capstone project presented a lot of challenges, some we would not even face if we weren't dealing with the limitations of covid. Having to rely on emails, facetime and group messaging for contact and meeting times was definitely hard but I think we handled it appropriately. Our first issue we ran into with our PICO question I was actually really grateful for. We had a lot of tweaking to do with it, which actually made our project easier since we narrowed in our PICO question very specific to breastfeeding and NICU nurses. I really think the tools we came up with, the linear flow chart and badge buddy, are tools that could be really helpful on this unit. I wish we could have presented on the unit and were able to bring these tools to the unit, but I believe we delivered our education to the unit very well. With the demands and deadlines with senior year definitely are stressful, especially handling role transition as well on top of capstone. It was amazing to see what we were able to create through all of it though. Near

the end, I enjoyed seeing everything come together and become an educational and inspiring work we all made.

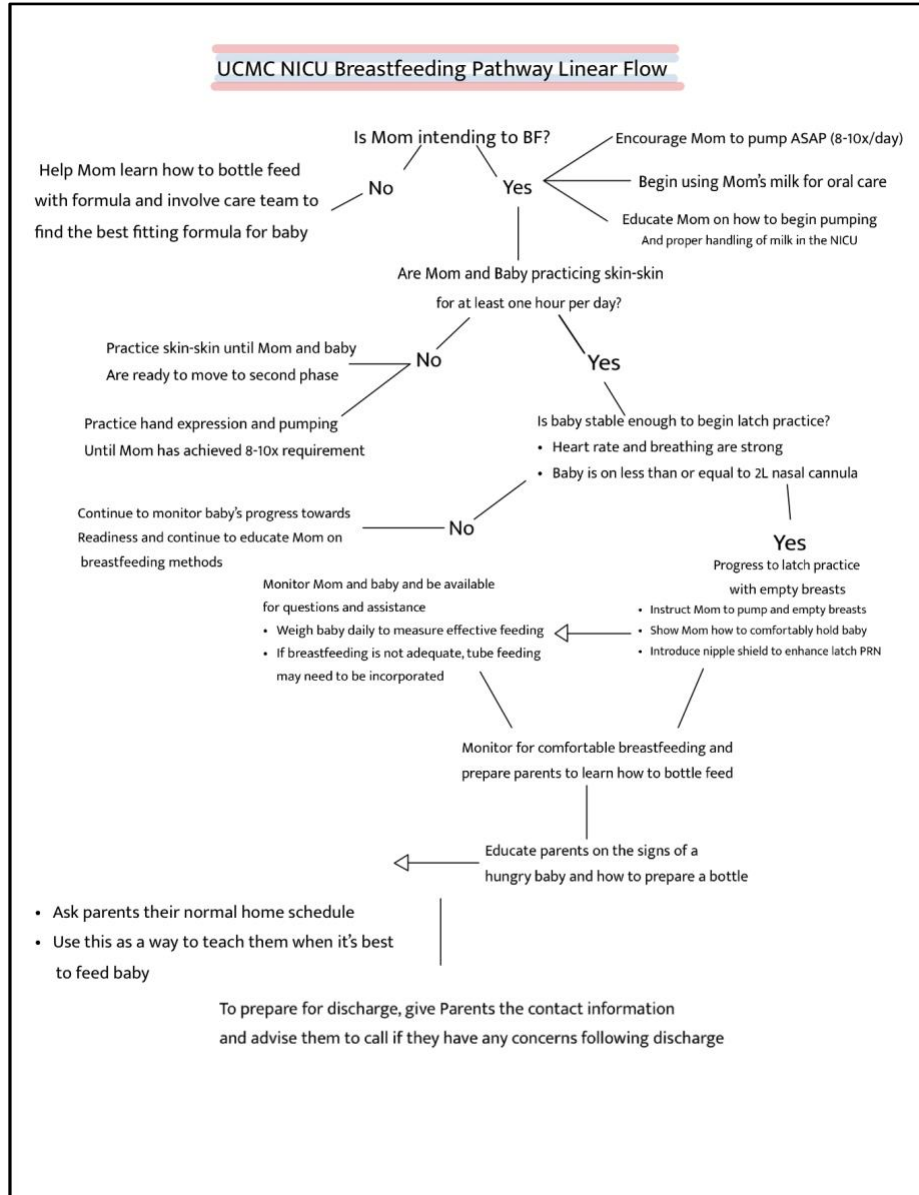
Kamryn:

I have gained a greater understanding of research throughout the development of this project. Although I have been a part of research projects in the past, this project exposed me to the hard work, commitment, time, and communication it takes to build a research project that could potentially implement a change in current practices in the healthcare setting. This project was challenging at times due to covid and being strictly online, I think we did a great job communicating virtually, creating plans, and setting guidelines to finishing our parts. This project showed me that when creating a research study like this, lots of changes will need to be made throughout the progress of the project that will set you back a little bit. When we made our first PICOT question, we thought it was good to go but after submitting it we received a lot of feedback on changes that should be made, this led to us changing our PICOT question more than a few times to really narrow down our topic and goals for this project. After presenting our research to the NICU nurses it was inspiring to receive feedback from them stating that our tools and recommendations could be beneficial to their practice. I do wish we were able to present our information in person considering it was difficult to do it over Zoom and receive our survey results in a timely manner, but I think we did well with managing it online and getting in touch with the NICU staff. In the end, this project showed me that I can potentially make a change to current practices if I have the research behind me to support it.

Lydia:

Being a part of this project has given me the tools I need to comfortably go about researching for current medical issues. As someone who is entering the workforce as a healthcare professional it is very important that I am comfortable researching current data. Working as a team of six demanded that we all make sacrifices with our schedules. With role transitions, jobs, and classes it became challenging at times to meet but we were flexible with the little free time we did have and made this project work. I think that collaborating on this project made me grow as an individual and made me a better team member. I think that my group did an excellent job identifying an issue and working together to create interventions to resolve our problems. I now have a better understanding of how effective using research is for promoting better health outcomes. I will use what I have learned completing this project as a nurse out in the field. Whenever I feel as if there is an error in practice, I will use what I have learned to research the issue and determine if there is a more effective way that things could be done. I am proud of all of the hard work that we have put into this project as a team. I think that for this project to be created and presented all online we used all of our resources appropriately and came up with a great end result.

Appendix B:



NICU Breastfeeding Double-Check

Phase 1: 1.1 Pumping & 1.2 Skin-to-Skin Care (stable baby)

- Pump 8-10 times per day
- Hold baby skin to skin at least 1x per day for 1 hour at a time

Phase 2: 2.1 Therapeutic Tastes & 2.2 Latch-on-practice at a pumped breast (no longer intubated)

- Hold baby skin to skin and use hand expression to let baby
- Introduce baby to drops of mom's milk
- THEN -
- Pump to empty breast and practice positioning baby to suck



Phase 3: 3.1 Breastfeeding, 3.2 Bottle Feeding, & 3.3 Feeding at Home (< 2 L nasal cannula)

- Allow baby to breastfeed and pump in between feeds
 - Test weight 1x/day
- Teach bottle feeding to baby, feed PRN or every 3 hours
- Practice at home bottle feeding schedule with mom

**** pump 8-10x/day, initiate skin-to-skin when not feeding ****