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TINY TUSKS INTERNSHIP: BARRIERS TO BREASTFEEDING SURROUNDING
NEONATAL INTENSIVE CARE UNITS

Tiny Tusks Internship:
Barriers to Breastfeeding Surrounding Neonatal Intensive Care Units

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NURS 498VH: Honors Internship

Dr. Vowell Johnson and Dr. Scott

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Introduction

From 2021-2022, we had the opportunity to be interns for Tiny Tusks Breastfeeding and Infant Support, a program directed by the Eleanor Mann School of Nursing. During our time in the program, we were able to support breastfeeding mothers and infants by providing breastfeeding services, education, and assistance at Razorback athletic events, including football, basketball, baseball, and gymnastics. The goal of the Tiny Tusk program is to provide a safe and comforting environment for mothers as well as reduce stigma and provide information regarding the benefits of breastfeeding. Although in the state of Arkansas, it is legal for a woman to breastfeed in any public place, mothers may still be hesitant to breastfeed, especially considering the loud and chaotic environment of a sports event. Our goal with Tiny Tusk was to promote and educate about the benefits of breastfeeding by providing an accepting environment for breastfeeding mothers. We did this by cleaning the space after each use, providing a changing table and water for mothers, and engaging and interacting with young children and mothers.

While this internship also introduced us to the difficulties of breastfeeding, we have also gained plenty of knowledge and skills beyond breastfeeding promotion. Throughout this experience, we had the opportunity to re-introduce the program during the COVID-19 pandemic, and we learned to engage our community and promote the program. In addition to working the location at sporting events, it was also our responsibility to run the Instagram and Twitter accounts for Tiny Tusk with the hopes of spreading awareness of the program and promoting breastfeeding. We learned that there is so much more to being a nurse than direct bedside care. Educating and promoting certain health topics, like breastfeeding, is crucial to the health of populations.

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This internship has provided skills and experience that will help support us to be well-rounded nurses in our respective fields. We have learned the importance of community, promoting health, and how to be adaptable while promoting a program during a pandemic.

Challenges and Lessons Learned

While our time spent as interns for Tiny Tusks was enriching, it was not without challenges. In the fall, the majority of the internship experience was spent at the University's football games. We were thankful that spectators were allowed at games, but the pandemic made it difficult to fully connect with mothers and their children. We had fewer visitors at our craft tables and fewer opportunities to mingle with the mothers utilizing our resources as compared to the years prior to the emergence of COVID-19. We liken this to the fact that some mothers were, rightfully so, hesitant to bring their young ones to be around massive crowds of people with the virus still active. On the other hand, we as interns were limited in our interactions as an effort to keep families safe and healthy. Where we would typically face paint, give temporary tattoos and play games, we pivoted to passing out crayons and coloring sheets for little ones to take to the stands and use individually. Not to mention, the very presence of masks prevented us from doing things as simple as smiling and making faces with the children. Initially, these things don't seem like much to be missed, but they were missed greatly when trying to connect with mother and baby. Additionally, since it had been two years since spectators were allowed to watch games in the physical stadium, we lost a bit of the following that interns before us had worked so hard to gather. Much of the fall was spent trying to regain program momentum and reestablish a following. One large lesson learned in this past year, and throughout this pandemic, is the power of technology, for better or worse. For better, we were able to work on the revival of Tiny Tusks

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through the power of social media. Recreating the Instagram and reviving the Twitter accounts helped people to know that the program was fully back up and running. We wanted to let people know where we were located and that we were present and ready to support breastfeeding mothers and infants, during the ebb and flow of COVID-19. For worse, we have all experienced the power of technology and the havoc it can wreak on information. Social media has been the driving force behind the spread of much misinformation in this time. A challenge we had to overcome related to the spread of misinformation on social media was debunking the common myths and misconceptions regarding COVID-19 present amongst our following. One way this was accomplished was through the development of a pamphlet that was given to all our mothers and moms-to-be at sporting events. The pamphlet presented an array of evidence-based information regarding breastfeeding and the virus. Portions of the information given in the pamphlet were also posted to our social accounts in an attempt to further spread positive and evidence-based information to mothers on breastfeeding during this difficult time. We feel that the culmination of the challenges we faced as interns, and the lessons learned through this internship, have better prepared us for our future endeavors as nurses. It has been a wonderful opportunity to take the knowledge from our didactic courses and clinical experiences, and apply them to real life interactions and situations in the world of maternal and infant care.

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Literature Review

One of our tasks for completion of the Tiny Tusk internship was writing a literature review. Being an intern for Tiny Tusk has allowed us to be exposed to breastfeeding and infants more than we had been in the past. We chose to explore barriers to breastfeeding, specifically among infants and families that were admitted to neonatal intensive care units (NICU).

The benefits of breastfeeding are endless, not just for the infant, but also for the mother. According to the Centers for Disease Control and Prevention (CDC), breastfed infants have reduced risks of asthma, obesity, type one diabetes, respiratory disease, ear infections, sudden infant death syndrome (SIDS), gastrointestinal disorders/infections, and necrotizing enterocolitis (CDC, 2021). For mothers, benefits include a lower risk of high blood pressure, type two diabetes, ovarian cancer, and breast cancer. (CDC, 2021). Despite all these benefits for infants and mothers, only 1 in 4 infants are exclusively breastfed for six months (CDC, 2021) and those rates are even lower for infants admitted to the neonatal intensive care unit. Additionally, the rates for breastfeeding in Arkansas are particularly low compared to the rest of the country; according to the CDC (2021), only 40-50% of infants in Arkansas are breastfed at 6 months which is only better than three other states. There are many barriers to breastfeeding for mothers of healthy infants who weren't admitted to the NICU, so we set out to find additional barriers for mothers of NICU infants and interventions to address those barriers.

Methods

Study Design

A systematic review of research was conducted on barriers to breastfeeding regarding infants and their families admitted to neonatal intensive care units. Databases utilized were CINAHL complete and MEDLINE complete. Medical Subject Headings (MeSH) were used with

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both databases to refine the search. MeSH terms used included *breastfeeding* AND *barriers or obstacles or challenges* AND *nicu or neonatal intensive care unit*. Search limiters applied to all databases included being a peer-reviewed scholarly article, written in English language, and published in the year 2016-2022. We did not limit this article geographically, because breastfeeding and barriers can apply to NICU settings globally.

Inclusion/Exclusion Criteria

After the search strategy was applied to CINAHL complete and MEDLINE complete, articles were reviewed against inclusion criteria. We included articles based off of the search question, which was, “What are the most common barriers to initial and continued breastfeeding in neonatal intensive care settings?” Articles were utilized in the systemic review if they included (a) barriers encompassing provider or healthcare attitudes and culture; (b) maternal-related barriers; (c) the study included interventions that addressed barriers.

Search Results

The initial search from CINAHL complete and MEDLINE complete produced 32 articles. CINAHL retrieved 12 articles and MEDLINE retrieved 20. After screening, 8 articles were removed for being duplicates leaving 24 articles to evaluate. Articles were evaluated against inclusion criteria. 14 articles were removed for not meeting inclusion criteria, leaving ten articles that fit our criteria for our systematic literature review. Figure 1 depicts our search process.

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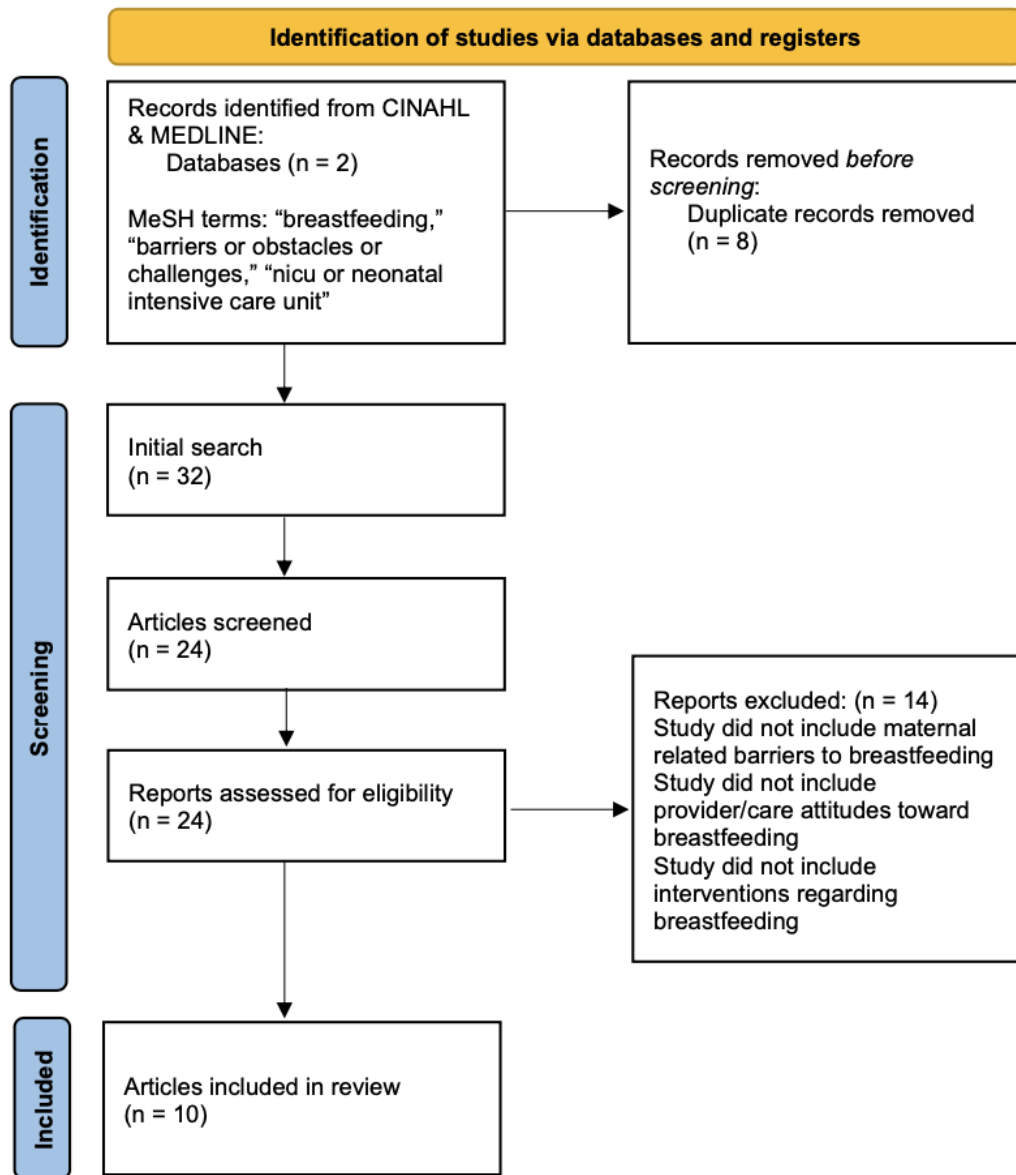


Figure 1. PRISMA flowchart to show article selection process.

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Results

In 2016, Kair and Colaizey found the likelihood that an infant admitted to the NICU breastfed for greater than 10 weeks was similar to the likelihood of a well-nursery infant adhering to breastfeeding for greater than 10 weeks when maternal education rates were high, when the mother was married, and the mother had a normal maternal BMI. The reasons that mothers did not continue to breastfeed past 10 weeks were perceived inadequate milk supply and nursing difficulties. These are modifiable risk factors that can be decreased with proper education on breastfeeding, including measures taken to understand milk supply, acknowledgement of the common difficulties breastfeeding mothers can experience, and the ways in which they can overcome these difficulties. These findings are similar to those of Daglas et al. (2018), who completed a cross sectional study conducted via telephone interview in Greece, different determinants that promoted, or prevented, mothers from breastfeeding once being discharged from the NICU. The study noted three specific themes: the support that the mother received at home, prior breastfeeding experience, and duration of the pregnancy. Mothers who had ample support at home, prior breastfeeding experience and averaged 34.1 weeks of gestation at birth breastfed at home much longer as compared to those who didn't. (Daglas et al., 2020).

In a study conducted by Naylor and Clark-Sather (2020) on intention to breastfeed, it was found that mothers with no intention to breastfeed, did indeed choose to breastfeed their baby when they were admitted to the NICU. The decision to breastfeed only lasted for an average of 2.2 months, as compared to mothers with the intention to breastfeed, who averaged expressing

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milk for 15.8 months. Increasing a mother's intention to breastfeed could decrease the likelihood of breastfeeding cessation when discharged from the NICU.

Heller et al. (2021) explored risk factors, both modifiable and non-modifiable, that were creating barriers to breastfeeding. Not establishing skin-to-skin contact in the delivery room or in the NICU was one risk factor to failed breastfeeding. Additionally, not utilizing varying techniques to milk expression and infant feeding risked failed breastfeeding. Unmodifiable risk factors included demographic risk factors, socioeconomic status, health and disease related factors of the infant and mother such as gestational diabetes mellitus or chronic substance abuse, as well as previous, typically negative, experiences with milk expression.

Jaywant et al. (2020) conducted a study in India and compared an experimental group to a controlled group to discover what positive effects a Person-Environment-Occupation (PEO) intervention model have on breastfeeding. The PEO experimental group was provided environmental support, stress-reducing counseling, family-centered care, and opportunities to determine how occupational efforts could best be provided for parents and preterm infants or NICU infants. This specific and specialized care was received in addition to the conventional care given to those in the control group of the experiment. Findings established that additional supportive measures like those provided by the PEO intervention model could be recommended for improving the breastfeeding capabilities of NICU mothers (Jaywant et al., 2020).

A cross sectional survey studied the knowledge and attitudes of nurses specifically in relation to the promotion of breastfeeding in the NICU. A staff cannot promote what they do not know, understand, or feel comfortable discussing with mothers. Improving such knowledge and attitudes towards nursing is crucial to promoting breastfeeding in the NICU (Vizzari et al., 2020).

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A qualitative study conducted in China by Yang et al. (2017) analyzed common themes amongst mothers who experienced breastfeeding difficulties with patients in the NICU. Data transcribed from the interviews found mothers reporting both physical and mental barriers to breastfeeding. From the physical perspective, mothers who were separated from their infants for extended or prolonged periods of time had difficulty establishing a milk supply. It should be noted here that mothers of infants in the NICU are restricted from seeing their babies in China, but the information on prolonged separation of mother from baby is still applicable. From a mental and emotional standpoint, it was commonly reported that mothers experienced difficulty identifying as a mother when unable to breastfeed, making it more difficult to want to breastfeed and formulate connection with the baby once they could have time together (Yang et al., 2017).

Gianni et al. (2018) reported in a cross sectional study completed in Italy, barriers for breastfeeding that related specifically to physical pumping of breast milk and difficulties in providing an adequate amount of milk for NICU infants. The findings suggested that rather than focusing efforts on improving pumping techniques, healthcare providers should focus on optimizing breast milk production and pour their efforts into endorsing direct breastfeeding to improve milk supply (Gianni et al., 2018). However, direct breastfeeding is not always possible. A systematic review and meta-analysis completed by Penny et al. (2018) in the United States gathered information on alternatives to bottle feeding, recognizing the importance of breastmilk, but understanding that breastfeeding is not always feasible for NICU mothers. High breastfeeding rates upon discharge, as well as stable heart rate, high oxygen saturation and appropriate weight gain were found when the babies were cup fed the breastmilk expressed by their mothers, rather than bottle fed (Penny et al., 2018).

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In Finland, a qualitative cross-sectional study was conducted by Holdren et al. (2019) to compare different methods to promoting breastfeeding. It was found that in the United States, pumping and breastfeeding was primarily promoted on the basis of nutritional grounds. In this Finnish NICU unit, breastfeeding was presented as an opportunity to achieve closeness with the infant and nutrition was an added benefit to this. Coupling breastfeeding with closeness promoted a salutogenic relationship that carried through the mother, infant and entire family. The authors noted that utilizing health promotion versus harping on disease prevention was beneficial in the continuation of breastfeeding. The narrative methodologies discussed how a lacking “care culture” can further hinder the promotion of breastfeeding (Holdren et al., 2019). A cross sectional survey studied the knowledge and attitudes of nurses specifically in relation to the promotion of breastfeeding in the NICU. A staff cannot promote what they do not know, understand, or feel comfortable discussing with mothers. Improving such knowledge and attitudes towards nursing is crucial to promoting breastfeeding in the NICU (Vizzari et al., 2020) and could create a better “care culture”.

Information on authors, publication year, design method, sample size and significant findings were observed and extracted from the ten articles included in this literature review. They are presented in Table 1.

Table 1

Characteristics of Studies and Data Extraction				
Author(s) & Year	Design Method	Sample Size	Country	Significant Findings
1. Kair & Colaizy (2016)	SAS Complex Survey	2530 mothers	United States	Odds of breastfeeding and breastfeeding for >10 weeks were similar among late preterm infants

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				(LPI) admitted to NICU vs well nursery. Factors associated with increased odds of breastfeeding for >10 weeks among LPI were higher maternal education, mother being married, and normal maternal BMI. Top reasons mothers of LPI discontinued breastfeeding early were perceived inadequate milk supply and nursing difficulties.
2. Naylor & Clark-Sather (2020)	Online Survey	148 respondents, 119 completed the entire survey	United States	Mothers with no intention to breastfeed prior to birth, decided to breastfeed and express milk after the baby was placed in NICU. However, these moms only breastfed for an average of 2.2 months. Moms with the intention to breastfeed averaged 15.8 months breastfeeding.
3. Heller et al., (2021)	QI project, literature review	368 preterm infants below 34 weeks gestational age	Germany	Modifiable risk factors to not breastfeeding include skin-to-skin contact in the delivery room and NICU, strategies of infant feeding and milk expression, and mode of delivery. Unmodifiable risk factors to not breastfeeding include demographic risk factors of the infant and the mother, health and disease related risk factors of the infant and mother, and maternal experiences with milk expression,
4. Jaywant et al., (2020)	randomized intervention -controlled study design	52 postpartum mothers of preterm infants of gestational age 28 weeks to 36 weeks from NICU	India	Experimental groups of the study were given required environmental support and counseling to reduce their stress, family centered care, and chances to determine how occupational efforts of parents and preterm infants can be best supported in addition to the conventional treatment of the control group. PEO intervention model can be recommended for improving mothers' breastfeeding capabilities in preterm neonates
5. Vizzari et	Cross	183 nurses in	Italy	Improving healthcare professionals'

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al., (2020)	sectional survey	six Italian NICUs		knowledge and attitude towards breastfeeding has been shown to be crucial for promoting breastfeeding in NICUs.
6. Yang et al., (2017)	Qualitative descriptive study. Interviews recorded and transcribed verbatim. Thematic analysis performed involving 7-step protocol to identify key themes.	11 mothers interviewed while separated from their infants in the NICU	China	Mothers reported physically and mentally challenging breastfeeding experiences in the periods they were separated from their infants. Specific challenges included difficulty establishing a milk supply and difficulty identifying as a mother when unable to breastfeed the baby.
7. Gianni et al., (2018)	Cross-sectional survey	64 mothers, leading to 81 infants	Italy	Barriers to breastfeeding included difficulties pumping breastmilk or difficulties in providing an adequate amount of milk to the infant. Health care providers should target their efforts to optimize breastfeeding by improving breast milk production and endorsing direct breastfeeding.
8. Holdren et al., (2019)	qualitative, cross-sectional study...utilized narrative methodologies	15 families with a hospitalized baby in the NICU, 8 from Finland and 7 from the United States	Finland	The study found that breastfeeding in the Finnish unit was one method to achieve closeness with an infant, while in the unit in the U.S pumping was mostly an end to promoting nutritional health. Breastfeeding coupled with closeness was found to be supportive of a salutogenic, or health-promoting, care approach for the whole family. Lack of “care culture” can be a barrier.
9. Penny et al., (2018)	Systemic review and meta	12 studies	United States	Preterm infants often have lower breastfeeding rates and face many breastfeeding challenges. It was found

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	analysis			that cup feeding with breastmilk, rather than bottle feeding, was found to have higher breastfeeding rates at discharge with continued higher rates and resulted in a more stable heart rate and oxygen saturation with similar weight gain. It is fundamentally important for NICU professionals to establish a protocol, education and training for the potential use of this feeding method for this vulnerable population.
10. Daglas et al., (2020)	Cross-sectional study	100 participants via telephone interview	Greece	According to this survey, the support that mother receives at home, the previous breastfeeding experience, and the duration of pregnancy represent the three determinants which significantly have an affect on the mothers' premature neonates decision for breastfeeding after leaving the NICU and returning home.

Discussion

The main barriers identified in this literature review can be broken into two main categories: maternal related barriers and barriers related to culture of care. One of the barriers that related specifically to the mother was young maternal age. Mothers of younger age typically had a lack of education on the benefits of breastfeeding or more difficulty adhering to breastfeeding after leaving the NICU. Marital status was another barrier to breastfeeding that related directly to the mother. Single mothers had a more difficult time breastfeeding than those who were married. Mothers of lower socioeconomic status had a more difficult time breastfeeding their NICU babies, in that the duration of breastfeeding was much shorter than those of higher socioeconomic status, typically returning to work out of financial necessity.

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Additionally, the presence of current and or past nicotine abuse made mothers less likely to breastfeed their NICU infants. Unfortunately, these barriers are considered unmodifiable due to the inability of the nurse to take any immediate action to overcome the barrier. However, knowledge of these barriers can help healthcare professionals understand why mothers exposed to these risk factors are less likely to breastfeed and research on creating and initiating preventative measures for the risk factors should be further explored. As nurses, creating awareness of these barriers, and the reasons behind them, amongst our profession will make us better at understanding mother's feeding decisions and better at tailoring breastfeeding education to each patient's specific needs. Regarding culture of care, the main barriers identified were the attitude of care in the NICU, the type of support provided, and the driving purpose of breastfeeding from the provider-perspective being nutrition driven, rather than a means to achieving closeness alongside obtaining adequate nutrition. These barriers are modifiable. Healthcare professionals should seek ways to promote NICU care that is specific to each individual family and not sunk into mundane routines or processes that are decided on by severity of the patient. Hospitals should promote a "caring culture", not just a culture that takes care of the immediate needs. Investment in the nurse-patient relationship by truly caring is found to be salutogenic for mom, baby and family alike, making the notion of breastfeeding all the more likely to be received and continued long after the baby leaves the NICU.

This literature review has several limitations. Only three of the ten studies utilized for this review were conducted in the United States. The other articles accessed were compiled from countries across the globe, including Germany, China, Italy, Finland, India and Greece. While this information is applicable across most nations, some of the information may not be directly applicable to healthcare in the United States of America. Another limitation to this review is the

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lack of information regarding continuation of breastfeeding after discharge of NICU related to the support given at home. Lack of support is a commonly cited barrier, yet a hard determinant to study due to most of the information related to the barrier coming from small groups of participants in survey-based studies, among different cultural backgrounds.

Conclusion

This literature review has given us the opportunity to investigate breastfeeding barriers specific to the NICU and strengthen the knowledge we have acquired throughout the Tiny Tusk internship. During the internship we have been given the opportunity to see some of these barriers firsthand, such as lack of support. There is a general lack of support for breastfeeding as evidenced by the fact that the only location to breastfeed in private in a clean and relaxing environment is our location at sporting events. There are many barriers to breastfeeding, generally found under two categories of non-modifiable and modifiable. In general, non-modifiable barriers would take widespread systemic changes to address and are unlikely to be impacted by smaller run community programs. However, more needs to be done to address the modifiable barriers of breastfeeding and support mothers, especially those with infants admitted to NICU settings.

Throughout this internship we have had the pleasure to address some of these barriers, mainly support and attitudes. Our goal with Tiny Tusks is to create a culture that is inclusive and supportive to mothers and infants that are breastfeeding, because it truly is so beneficial to both. In the future, we hope that our efforts will be continued through Tiny Tusk, and that the program will continue to grow and support mothers throughout their journey of breastfeeding.

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