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Implementation of a Zone of Silence During Administration of Breastmilk to Decrease Nurses' Distractions in a Neonatal Intensive Care Unit: Quality Improvement Project

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A DNP Project submitted in partial fulfillment of the requirements for the degree of Doctor of Nursing practice

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This is to certify that the DNP Project Final Report by
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Abstract

Introduction: In the NICU, breastmilk is handled and administered as safely and carefully as a medication. Administration errors occur when incorrect breastmilk is administered to the wrong patient. This can lead to the transmission of infectious disease and create the loss of trust between families and the healthcare team during a neonate's NICU stay. Nurses are often faced with interruptions and distractions during administration, and evidence shows that interventions to reduce nurses' distractions lead to reduction of administration errors in inpatient settings. This quality improvement project took place in a level III NICU. It implemented an evidence-based zone of silence for nurses to use during administration of breastmilk. The project's goals were to increase understanding of the importance of no distractions during breastmilk administration, and to decrease distractions and interruptions during breastmilk administration.

Methods: Nurses were given written education as well as verbal education on the zone of silence and its importance. Parents of neonates were given educational brochures and verbal education. Likert Scale surveys were used to collect and analyze qualitative data reported by nurses.

Results: The zone of silence decreased nurses' level of distraction as well as their greatest sources of distraction.

Conclusion: Nurses' distractions decreased as the project went through its four PDSA Cycles. Their greatest distractions were reduced through proper education and use of the zone of silence. By the end of the project, the greatest sources of distractions were the nurses' new responsibilities, utilization of a new EHR, and an increase in patient load, which are not able to impacted by the zone of silence.

Keywords: NICU, breastmilk administration, nurse distractions, zone of silence, administration errors

Problem Identification and Evidence Review

Description of Significance of Problem and Local Problem

In healthcare, administration errors, whether medications, blood, or breastmilk, are preventable events that occur when a nurse administers the incorrect substance to the wrong patient. In a Neonatal Intensive Care Unit (NICU) Registered Nurses (RN) administer to a neonate their mother's expressed breastmilk (EBM). According to Grissinger (2015) nurses are distracted and interrupted during administration every two minutes. This is considered the norm, as all healthcare workers have become proficient in multitasking. However, evidence shows that harmful errors are doubled four times during a single medication administration. Administration of the wrong breastmilk can lead to the transmission of infectious disease, result in increased blood testing of the parents and infant involved, as well as destroy the trust between the families and healthcare team during the neonate's NICU stay (Sauer, 2016). At a hospital in Brooklyn, New York, EBM is administered to a breastfeeding neonate in the NICU eight times in a twenty-four-hour period. During each of these times, nurses face multiple interruptions.

Evidence shows that the main sources of interruptions for nurses were other healthcare providers, telephones, family members, and equipment failure (Monteiro et al., 2015). Evidence also shows that interventions to reduce nurses' distractions led to reducing administration errors in inpatient settings. The Agency for Healthcare Research and Quality recommends healthcare organizations to implement distraction free zones (Yoder et al., 2015). One project found that after implementing a distraction free zone, the percentage of nurses that reported no interruptions during medication administration increased by over fifty percent (Zamani et al., 2019).

At a hospital in Brooklyn, New York, the Neonatal Intensive Care Unit (NICU) treats expressed breast milk (EBM) as if it were a medication. This means that each nurse labels each

mother's breastmilk. The nurses scan this barcode label it into the computer, and before administration to the neonate, they scan the baby's identification band, and the bottle's label again. The nurses have also been trained to double check the EBM label and the patient's identification using their name and medical record number before administering. However, with all of these safety measures in place, there were still several breast milk administration errors on the unit in 2021.

Organizational Priority

This project is supported by the hospital's Director of Nursing Practice, Quality and Education, and Vice President and Chief Nursing Officer. In an effort to adhere to evidence-based practice and provide quality care to mothers of newborns, this hospital has joined the baby friendly initiative in order to become baby friendly designated. Therefore, it is pertinent that all Registered Nurses are fully trained on how to support breastfeeding and breastfeeding mothers, in a safe and effective way.

Development of Clinical Question

The purpose of this project was to assess the greatest sources of distraction for Registered Nurses in the Neonatal Intensive Care Unit during the administration of expressed breast milk to their patients. The project sought to determine if implementing a zone of silence for nurses to use during this time would decrease their level of distraction.

Focused Search Question

In the NICU (P) how does a zone of silence (I) compared with no zone of silence (C) reduce nurses' level of distraction during breastmilk administration (O).

Evidence Search and Review

External Evidence

The databases used to search for evidence included Medline, CINAHL, Cochrane Library of Systematic Reviews, and Google Scholar. Keywords included NICU, Neonatal intensive care unit, safe zone, zone of silence, nurse, breastmilk administration, breastmilk error, medication error, medication administration error, adverse event, drug error, distraction, interruption. Evidence was limited to articles written in English. Evidence was limited to articles published between 2008-2021. Articles chosen depended on the strength of the evidence, as well as those that used the zone of silence for medication administration in the inpatient setting. No articles were found that have reported using the zone of silence for breastmilk administration (Appendix A).

Internal Evidence

Baseline data was collected beginning on August 1, 2021 and ended on September 1, 2021. The data collected was the percentage of the hospital's NICU nurses that did not scan expressed breastmilk at the patient's bedside before administration. This was collected via surveys given to project champions which were also the project's secret shoppers. It was ensured that there would be champions and secret shoppers on all shifts every day for that one month. The goal was that the secret shoppers would observe 80 percent of the nurses working on the unit each shift. Data collected also included NICU nurses' perceived level of distraction during EBM administration. The nurses were given anonymous Likert Scale surveys so that they could rate their level of distraction and types of distractions.

Evidence Appraisal, Summary, and Recommendations

The rapid critical appraisal tool by Melnyk and Fineout-Overholt (2019) was used to rate the articles' quality and decide their strength in relation to the DNP project. Of the 14 selected articles, three are level IV studies, three are level V studies, two are level VI studies, two are level VII studies, and four are level VIII studies. Eight of the studies had significant findings in decreasing nurses' distractions, five studies significantly decreased administration errors, and all articles have high quality of evidence (see Appendix B and C).

Project Plan

Project Goals

The project's goals were to increase understanding of the importance of reducing distractions during breastmilk administration and for the zone of silence to decrease nurses' perceived level of distraction and source of distraction during administration of breast milk.

Context

The hospital that this project took place in is an acute care, teaching hospital with a Level III Neonatal Intensive Care Unit. The NICU has a maximum capacity of 24 beds, and has an open concept unit, in which each individual incubator has its own small area. However, the patients do not have individual hospital rooms. The unit has six to ten Registered Nurses at all times, along with one attending neonatologist, one or two resident physicians, and one Nurse Practitioner. Between 8:00am and 5:00pm, the Nurse Manager, lactation consultant, and nurse educator are also available on the unit. All breastfeeding patients and NICU nurses are involved in this project.

Key Stakeholders

The nurse manager of NICU, the Vice President and Chief Officer of Nursing, and the Director of Nursing Practice, Quality and Education needed to approve this project. The nurse manager makes decisions for the unit, together with staffing and the rest of the team. They are allowed to implement changes together with the attending physicians. If there are any problems, the managers go to up the chain-of-command to the Director of Nursing and Chief Nursing Officer. Every NICU nurse was a stakeholder in this project, as they will be at the frontline of patient care. The nurse educator was the project mentor for this project and thus was also a stakeholder in this project.

Framework

The Model for Improvement intends to "develop, test, implement, and spread changes that result in improved outcomes," (Melnyk & Fineout-Overholt, 2019). This model has two parts. The first part consists of three questions. The questions ask what the aim of the project is, how the improvement will be measured, and what changes will be made to result in improvement. The second part is the Plan-Do-Study-Act cycle ("The model for improvement," 2011). The Model for Improvement was used for this project, including the Plan-Do-Study-Act cycle.

Each month the project was evaluated in order to determine if any changes needed to be made. The data was collected by giving nurses an anonymous survey with seven statements that assessed their levels and sources of distraction. Their responses were collected using a five point Likert scale for each statement. The project was planned, designed, and implemented from August 2021 and was finished by December 2021.

Plan Phase

Before implementation, the entire NICU team was educated weekly on the zone of silence during daily morning huddles. Eighty six percent of the nurses in the NICU received this education. Additions were made to the unit's centered bulletin board, including the zone of silence signs that showed a yellow stop sign, written education on the zone of silence, and evidence supporting the zone of silence. This bulletin board is always visible to all nurses, as well as visitors. Parents were also verbally educated on the zone of silence and yellow stop signs. The yellow stop signs were laminated and attached to each patient's incubator or bassinet. The signs read, "Stop. Your nurse is in their zone of silence. No interruptions please." Surveys with Likert scales were given to each nurse before the implementation of the zone of silence to collect baseline data.

Do Phase

The zone of silence indicator - a yellow stop sign - was attached to each breastfeeding patient's incubator or basinet and was flipped onto its blank side when not in use (Appendix D). Surveys with Likert scales were given each nurse at the end of each month or PDSA cycle, for four months of the implementation phase (Appendix E). Each survey was used to assess their level of distraction, as well as the source. There was a blank comment section so that the nurses could anonymously state any questions, comments, suggestions that they had in order to assist with making the project successful. Secret shoppers were selected, whom were all NICU nurses. They were given education on the project and how to use the zone of silence and therefore held the role of project champions. They were trained to be able to provide nurses with extra help during each shift if needed. These secret shoppers were given forms to fill out during each of their shifts, to objectively observe the nurses' distractions during each feeding time. On a

separate form, the secret shoppers recorded the number of nurses that were correctly using the zone of silence during EBM administration. They also recorded the number and sources of distractions the nurses faced during breastmilk administration, so that it could be compared with the nurses' perceived level and source of distraction (Appendix F).

Study Phase

The data from the nurses' Likert Scale surveys was collected monthly and the surveys from the secret shoppers was collected every two weeks for review. The data was interpreted and the comments from the nurses' surveys were analyzed. Huddles were held by the DNP student together with the nurse manager to provide the team with the data collected from the Likert Scale surveys only, as they were not aware of the secret shoppers on the unit. Questions and comments were shared. The DNP student continued to work 13 shifts per month and was available to day shift and night shift for further help and education. The project champions were provided with education on the zone of silence so that they could also be an extra resource for the nurses during the live implementation phase of the project.

Act Phase

The DNP student used the anonymous Likert Scale Surveys, nurses' comments, and secret shoppers' surveys to adjust necessary components of the QI project before beginning each new PDSA cycle. There were four cycles in total.

Possible Barriers to Implementation

The nurses may feel that they are being seen as incompetent, and that this project is a punishment for mistakes that have been made in the past. They may also be unwilling to take part in this project because it could be viewed as adding work and new roles to their already hectic and busy work day. The nurses also may feel that the zone of silence will require them to

spend more time at one bedside, which will take time away from their more highly acute patients. Another issue that may arise, is that the zone of silence will be done at each patient's bedside since that is where the last check is done before EBM administration. However, most distractions also occur at the bedside, such as parents and visitors, as well as physician rounds. Some methods for addressing these barriers include frequent huddles so that nurses from each shift will be able to voice concerns and suggestions, as well as ask questions. There will be in-services and resources for extra assistance and education on utilizing the zone of silence.

Sustainment

Celebrating the success of the healthcare team using the zone of silence will be very important. They will be thanked and their hard work acknowledged during huddles. They will be provided with edible rewards such as snacks or meals throughout the project (Cullen & Adams, 2012). Public recognition for the units' successful implementation of the EBP change will be established in via the hospital's website in which each nurse has access to news about their own facilities and the entire organization. Monthly huddles with the NICU team will continue through the end of the project to allow the team to provide their own feedback. This is important in order to empower the team and acknowledge that their concerns are being met (Cullen & Adams, 2012). The project results will also be presented to the units' physicians and Nurse Practitioners, the Chief Officer of Nursing, and Director of Nursing Practice, Quality and Education at this hospital. Therefore, if results are what is expected, a new policy can officially be implemented into the hospital. The timeline for this entire QI project is portrayed in Appendix G.

Dissemination

Evidence from the Quality Improvement project will be presented in the form of a poster which will display updates and graphs of the data collected during the live implementation

phase. A PowerPoint presentation will be created with data from the QI project and presented to the team and the hospital stakeholders that approved the project. The PowerPoint will be utilized to publish evidence that supports the need for the practice change at the hospital. This will be presented at the Research and Evidence Based Practice Council.

Resources

This project will not cost the hospital any money. Indirect resources include adequate staffing to provide for nurses to assist while other nurses are administering EBM in the zone of silence. Direct resources included printing the stop signs, educational material for the nurses, which to be done by the DNP student. Workstations on Wheels (WOWs) will also be needed to ensure each nurse can scan EBM at the bedside while in the zone of silence.

Ethical Merit

This project meets the criteria for QI and does not need IRB review (Appendix H). The Project was reviewed and approved by the Chief Officer of Nursing and the Director of Nursing Practice, Quality and Education.

Project Implementation

Evaluation

The live of phase of the QI project began on September 1, 2021 and ended on December 31, 2021. The yellow stop signs which indicated the zone of silence, printed evidence supporting the zone of silence, and printed educational material on the zone of silence was hung on the unit's bulletin board, located in the center of the NICU, visible from all nursing stations. Bimonthly huddles were conducted in which the QI project was discussed, its importance emphasized, and nurses were provided opportunities to report feedback. Regular huddles or meetings with the entire team have been shown to help identify, review, and solve problems to

create and sustain improvement (Silver at al., 2016). Throughout the project, the DNP student spoke to each individual nurses on each shift to ensure that they understood and were utilizing the zone of silence stop signs. At this time, more feedback was given by nurses and questions were answered.

After the first four weeks of live implementation, PDSA cycle one was completed. It was determined that the nurses' main concern was that the many of the patients' parents were not compliant with the zone of silence, and they were still interrupting nurses during EBM administration. The DNP student and nurse manager spent extra days speaking with parents on the unit to reeducate them on the zone of silence. Comments from the nurses demonstrated concern that if a parent was not sitting on the patient's right side, they would not see the hanging zone of silence sign. In response, the signs were hung from the back of each WOW, since the nurses park the WOW in front of the patient's bedside when they are preparing and getting ready to scan the milk. The scanners are attached to the WOW. The project champions reported 100 percent nurse compliance to utilization of the zone of silence. However, they were only able to observe about 30 percent of the nurses each day due to being busy with their own patient assignment.

Bimonthly huddles and meetings continued throughout the second PDSA cycle. The DNP student continued to remind project champions to quietly and secretly observe the nurses during EBM administration times, which is four times per each shift. However, the project champions had each reported that they were finding it very difficult to do their own work while also watching others. The major reason reported was because the unit had become severely short staffed and there was an increase in NICU admissions. After two consecutive weeks of the champions being unable to observe nurses on the NICU, it was determined that the secret

shoppers would no longer be used in the project, and the data collected would be solely from the nurses' perceived levels of distraction as recorded in their Likert Scale Surveys.

At the halfway mark of month two, the nurses reported forgetting to use the zone of silence and stop signs, though remained vigilant to ensure patient safety during EBM administration. However, if the stop signs were not being used, the nurses would be at risk of facing greater levels of distraction. Nightshift nurses' comments often included forgetting to use the zone of silence because parents are not at the bedside as often. They were reeducated to always use the zone of silence when EBM is being administered, even if parents are not at the bedside, because nurses and other providers also need be aware of decreasing distractions for nurses. The nurses heavily reported forgetting to use the stop signs due to being distracted with preparation for a visit from the Joint Commission.

Very early third PDSA cycle, one nurse suggested that the signs may be confusing to parents. This nurse explained that when the signs are in use they are yellow, vibrant stop signs, but when not in use, they were just blank white signs. Therefore, the word "Go," was added to the back of each sign, in a dark green color, so each parent would know when the zone of silence did not have to be observed. It was also found that since some parents do not visit as frequently, and with so many new patients and families being admitted to the NICU, some parents may not have received education on the zone of silence. Therefore, educational brochures explaining the zone of silence and QI project were printed and left in the unit's QI project binder which was located on the main nursing station. They were also given out by the DNP student and nurse manager several days per week to try to ensure that the majority of the parents were educated and aware of the zone of silence. Halfway through this cycle, nurses reported being busier than usual due to both the patient load and extreme short staffing. There had also been the

implementation of a new electronic health record during this cycle. During huddles, the nurses reported spending most of their shifts trying chart and learn the new system and that the zone of silence was often forgotten, despite understanding how important it was. Fortunately, by the end of this cycle, travel nurses and new NICU RNs were hired.

During the fourth and final PDSA cycle, the day shift and night shift had to switch some roles and responsibilities due to the new electronic health record system. Therefore, more nurses were reportedly busy while getting accustomed to their new roles. They were also very distracted because while parents were visiting, the nurses were learning a new EHR, had switched certain roles between shifts, were still short staffed.

Project Results

The data collected during the pre-implementation phase and throughout the first two PDSA cycles showed that patients' parents were the nurses' highest measured source of distraction during administration of expressed breast milk. The second and third highest measured sources were doctors completing patient rounds during the first feeding time of each shift, and other nurses. Free comments showed that phone calls and daily 6:00pm intravenous fluid changes were the two most reported distractions that were not listed on the Likert Scale. However, from PDSA cycle one to PDSA cycle two, the percentage of nurses that reported other nurses as their top distraction, decreased by 40 percent.

Baseline data showed that about half of the nurses surveyed reported facing greater than three distractions during breastmilk administration. From PDSA cycle one to PDSA cycle two, this percentage went from 29 percent to 26 percent. Baseline data showed that 85 percent of nurses feel that they are faced with distractions often, during EBM administration. The percentage of nurses that reported witnessing other nurses being distracted was 96 percent. By

the end of PDSA cycle one, 71% reported facing distractions often, and 86 percent reported witnessing others being distracted. By the end of PDSA cycle two, 65 percent reported being distracted often, and 53 percent reported seeing other nurses being distracted. Secret shoppers reported that 100% of the nurses observed utilized the zone of silence appropriately during the pre-implementation phase and PDSA cycle one. However, they were only able to observe about 30 percent of the nurses per shift. The secret shoppers' role was eliminated during the second PDSA cycle.

In PDSA cycle three, it was found that doctors and parents were the top two distractions as reported by nurses on the Likert Scale. However, the percentage of nurses that reported these distractions had decreased. At the end of PDSA cycle three, 41% reported doctors as top distractions and 27 percent reported parents. However, 59 percent of nurses still reported being faced with distractions often and 64 percent reported other nurses being distracted. Fifty nine percent strongly agreed or agree with the statement that they face less than three distractions during EBM administration and 0.1% reported facing greater than three. At the end of PDSA cycle four, 29% reported doctors as greatest distractions. For the first time in PDSA cycles three and four, no nurses reported other nurses as being distractions. In PDSA cycle four, 0.1% of nurses reported parents as a top distraction. However, the nurses still had high sources of distraction, even if not those listed in the Likert Scale, because 79 percent reported being faced with distractions often. Twenty four percent reported observing other nurses face distractions. Seventy four percent reported facing less than three distractions, and 32% faced greater than three. In these last two cycles, free comments showed that short staffing, switching of roles and responsibilities between day shift and night shift, and the new EHR were extremely burdensome distractions. Over the course of the project, more nurses reported facing less than three

distractions during administration of breastmilk than they did before implementation of the zone of silence, yet the majority still reported being faced with distractions often. Since the distractions listed in the Likert Scale were reported less frequently by the end of the project, it can be inferred that the most burdensome sources of distraction were the ones listed by nurses in the free comment section of the surveys. These distractions were from outside forces that could not be controlled.

Process Measures and Outcome Measures

The process measures included the data from the secret shoppers' surveys in the pre-implementation phase and month one of the projects. During these phases and the remaining PDSA cycles, the process measures were the Likert Scale Surveys obtained by each nurse. This data was analyzed to determine what needed to be adjusted or changed before beginning the next cycle, to ensure that the project was implemented to its best ability.

The outcome measures included the parts of the project that were adjusted to meet the needs of the project and the nurses, such as adding signs to WOWs, implementing use of educational brochures, and adding a "go" indicator on the back of each stop sign. The run chart shows how these measures affected outcomes of the project over time, specifically nurses' levels of distraction (Appendix I). Pareto charts show how the highest reported sources of distractions varied and changed throughout the four PDSA cycles (Appendix J).

Return on Investment

There was no money spent on behalf of the hospital in which the project took place in. Educational resources and stop signs were printed by the DNP student. There is only one published journal article able to be found, that reports breastmilk administration errors in a hospital setting. In this article, Sauer and Marc-Aurele (2016) discussed one court case in which

there was a threatened $30,000 lawsuit against one hospital for damages related to a breastmilk administration error. Therefore, implementing the zone of silence to decrease nurses' distractions, in an effort to reduce breastmilk administration errors, can prevent the hospital from being a part of a malpractice lawsuit. Eliminating administration errors directly impacts the level of satisfaction for families of the NICU patients. In turn this will help to increase Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores, which benefit the organization.

Discussion

This quality improvement project implemented a zone of silence in the NICU, to be used by RNs during all handling and administration of expressed breast milk. Overall, this project had favorable results and accomplished its goal of decreasing distractions of nurses during EBM administration. The validity of the data may be lower if the nurses did not always use the zone of silence. The secret shoppers reported 100% adherence rates of the nurses. However, the secret shoppers have not observed every nurse during each of their shifts. From PDSA cycles two to four, an honor system was used only. Concurrent with the quality improvement project, was an unusually high patient census, high patient acuity, and a severe shortage of staff nurses. The unit had a visit from the Joint Commission, switched over to a new EHR, and as a result the nurses had different and new roles on each of their shifts. These factors were reported to be significant distractions. Doctors remained the greatest distractions, of the ones listed on the Likert Scale, however, there was a decrease in the percentage of nurses that reported this. Nurses, doctors, and parents were the three types of distractions listed on the Likert Scale surveys. However, if the other distractions reported, such as the new EHR and lack of adequate staffing, then those may have become the top reported distractions on the Likert Scale.

This QI project was successful in decreasing parents, nurses, and providers as top distractions. However, it seems that throughout the entire project, most of the nurses that answered the surveys still faced several distractions. It was often reported that because of this they don't always remember to use the zone of silence and stop signs. It could be established that the zone of silence has an important place on this NICU, however, it could have achieved more desirable results if it was implemented during a time with less stressors and different changes occurring on the unit. It should also be noted though, that the reliability of the project could have been affected because not everyone who was given a survey, gave one back at the end of each cycle. There were less nurses working on the unit during PDSA cycles three and four. Participation from the pre-implementation phase to PDSA cycle three staggered from 52 percent to 27 percent, to 65 percent, to 55 percent. However, participation rose to 85 percent at the end of the last PDSA cycle (Appendix K).

The project is generalizable to NICU nurses at this hospital location. The unit has specific distractions related to the recent organization changes. However, the project can be used as a model for other NICUs in other organizations that want to implement a zone of silence to decrease distractions relating to EBM administration.

Dissemination

Implications of the Project Results to the Organization and Wider Practice

This project has provided evidence that a zone of silence in the level III NICU at one hospital in Brooklyn, New York, can decrease nurses' distractions during administration of expressed breastmilk. This is important because evidence shows that a decrease in distractions has results in fewer administration errors. Administration errors can lead to the loss of trust between patient and provider, a risk of disease transmission to the neonate, malpractice lawsuits,

and unwanted stress among all involved individuals. The zone of silence should be utilized across all healthcare organizations that provide patients with medications, blood, or expressed breastmilk. Every single healthcare organization provides patients with at least one of these substances and therefore, this project can be useful at any healthcare organization.

Executive Summary

This QI project sought to decrease nurses' level of distraction in a level III NICU during administration of expressed breastmilk to their neonate patients. Administration errors in the hospital setting are most reportedly due to distractions. Evidence shows that a safe, silent zone decreases nurses' distractions when they are preparing and administering a medication. Therefore, this leads to less administration errors. The focused question that this project sought to answer was, "In the NICU how does a zone of silence compared with no zone of silence reduce nurses' level of distraction during breastmilk administration."

The QI project took place in a level III NICU in a hospital in Brooklyn, New York. During the pre-implementation phase, nurses were given written education and verbal education on the zone of silence, printed evidence to support it, and how to use it. There was a bulletin board in the center of the unit, visible to all nurses, providers, and visitors, with educational material and yellow, zone of silence stop signs were hung. Expressed breast milk is labeled and scanned before administration, and is treated like any other medication. During the live implementation phase, the zone of silence was used by the nurse during the feedings for every neonate on the unit whose mother was supplying expressed breastmilk. While the nurses were handling, labeling, preparing, and administering the breastmilk to the patient, the yellow stop sign was turned so everyone could see it. When the nurse was finished, they turned the sign over to its opposite side, which read the word, "go," in green.

Before the live implementation phase, baseline data was collected using Likert Scale surveys, so the nurses could rate their level of distraction and greatest sources of distraction during breastmilk administration. Project champions were nurses on the unit, available for extra support and education throughout the day shift and night shift. They were also secret shoppers and they observed nurses while administering breastmilk. The purpose of this data was to compare the distractions the nurses faced with the distractions they perceived to face. By the beginning of the second PDSA cycle, it was determined that the secret shoppers would remain project champions but would not observe and record the nurses' adherence to the zone of silence during EBM administration. This is because the secret shoppers were unable complete their own work and still observe others doing theirs.

The same Likert Scale surveys were given to every nurse on the unit at the end of each month of the live implementation phase for four consecutive months or PDSA cycles. It was found that before the QI project, nurses' highest types of distractions were parents, doctors doing patient rounds during "feeding" times, other nurses. Throughout the first two PDSA cycles this remained true. As the project went on, the zone of silence helped to decrease the percentage of nurses that strongly agreed or agreed that these factors were their top sources of distraction, and that they were faced with distractions "often." During the QI project's implementation, the unit was facing stressful changes, such as a new EHR, new roles and responsibilities, and a visit from Joint Commission. Therefore, the nurses reported feeling extremely overwhelmed, with not much time to think about anything else in their already hectic days. The percentage of nurses that reported having greater than three distractions during EBM administration initially decreased to almost zero by PDSA cycle three. However, it rose to 32 percent by the end of the project. It is also important to note that throughout the project, there was a decrease in the number of nurses

working on the unit, and new nurses and travel nurses were hired. Therefore, there were less surveys given out during the second half of the project. Also, not all surveys were given back for data collection.

This project had goals of creating an understanding of the zone of silence and its importance. Another goal was to decrease nurses' reported distractions during EBM administration. This project was started to improve patient safety and quality of care. This project could have had more significant results if done at a time when there were fewer external stressors that could not be relieved by using the zone of silence. However, this zone of silence did create a greater understanding of its importance and did decrease the original highest rate sources of distraction for nurses in the NICU during EBM administration.

Key Lessons Learned

The beginning of the project likely would have gone smoother if the parents received education on the zone of silence at the time of admission when they receive all initial information about the NICU. This would have decreased the likelihood of any parent not receiving education on the zone of silence. A QI project is more effective and implemented more efficiently to when there is no other change occurring on the unit. The nurses were the key stakeholders in this project because the data was taken directly from their self-reports, and because they are the primary caregivers for each neonate. The nurses expressed interest and excitement for this project, as it would create less distractions for them and thus increase patient safety and quality of care. However, because the project was implemented at a time when nurses were already under great stress, this impacted their participation in the project.

Evidence shows that nurses are less engaged in evidence-based practice when they are faced with barriers such as lack of time, heavy patient loads, and staff shortages. Organizational

changes were found to have a negative impact when implementing new practice. This is because it was a constant distractor for nurses and used up most of their time (Mathieson et al., 2018). Other than constant re-education and reinforcement of the project's importance, other strategies could have been explored to encourage participation in the project, without straining the nurses' work day even more. If there were more time, the nurses possibly could have received longer training sessions on the zone of silence, perhaps even offering two hours of overtime if they completed a training module on it. It would also have been more efficient if time allowed for the project to be started several months after the nurses were more comfortable with their new EHR and change in roles on their specific shifts.

Sustainability Plan

The plan for sustainability began early in the project. The Model for Improvement focuses on constantly reassessing what needs to be adjusted to make the project successful and fit into context. Evidence shows that over one third of QI projects are no longer sustained after one year of completion (Silver et al., 2016). Some methods to sustain this practice change that are already in progress are bimonthly huddles with the team to discuss the practice change and address concerns or suggestions moving forward. Reeducation will be needed in order to keep the team interested in the practice change and remembering to continue using the zone of silence to support quality patient care. The poster presentation, highlighting the project's main goals, methods, and results, will be shared with the team as well as other organizations to praise the team for their hard work, and share this important evidence so that other organizations may adopt this practice change (Appendix L).

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Appendix

Appendix A

Evidence Search

Search Terms Google	Number of hits	Number of title & abstract reviewed	Number of full-text articles reviewed	Number of articles selected for this review without duplicates
Zone of silence to avoid breastmilk errors by nurses	11 million	7	7	0
Zone of silence to avoid medication errors by nurses	6 million	8	8	0

Search Terms CINAHL	Number of hits	Number of title & abstract reviewed	Number of full-text articles reviewed	Number of articles selected for this review without duplicates
-Zone of silence AND Nursing - Zone of Silence AND medication errors or drug errors or medication administration errors or drug administration errors - Silence AND medication errors or drug errors or medication administration errors or drug administration errors - Safe zone AND Breastmilk administration	0	0	0	0
Safe Zone AND medication errors or drug errors or medication administration errors or drug administration errors	2	2	2	1
Safe zone AND Nurses or nurse or nursing	13	13	10	1

Distractions AND Medication error AND Nurses or nurse or nursing	92	92	74	17
Distractions AND NICU and Nurses or nurse or nursing	5	5	5	0
Distractions AND Perceptions and Nurse or nurses or nursing	83	73	50	7
Breastmilk AND errors or mistakes or incidents or adverse events	83	83	15	8

Search Terms Medline	Number of hits	Number of title & abstract reviewed	Number of full-text articles reviewed	Number of articles selected for this review without duplicates
-Safe Zone AND Breastmilk administration -Silence AND nursing -Zone of Silence AND medication errors or drug errors or medication administration errors or drug administration errors	0	0	0	0
Silence AND medication errors or drug errors or medication administration errors or drug administration errors	6	6	4	4
Safe Zone AND medication errors or drug errors or medication	2	2	0	0

administration errors or drug administration errors				
Safe Zone AND Nurses	19	19	3	1
Distractions AND medication errors or drug errors or medication administration errors or drug administration errors AND nursing or nurses or nurse	88	75	30	25
Distraction AND NICU AND Nurse or nurses or nursing	5	5	4	0
Breastmilk AND errors or mistakes or adverse events	83	83	8	0

Appendix B

Level of Evidence Synthesis Table

Article No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Level I														
Level II														

Level III														
Level IV					X			X	X					
Level V										X		X		X
Level VI							X				X			
Level VII	X		X											
Level VIII		X		X		X							X	

Appendix C
Outcomes Synthesis Table

	Factors Affected by Zone of Silence		
Article First Author and year	Distractions and Interruptions	Nurses' perception of distractions	Medication administration errors
1. Katherine Bravo (2016)	Not determined	Not evaluated	Not determined
2. Jean Anne Connor (2016)	Decreased	Not evaluated	Decreased
3. Matthew Grissinger (2015)	Not evaluated	Not evaluated	Not evaluated
4. Kevin Kavanagh (2020)	Decreased	Decreased	Decreased
5. Richard N. Keers (2013)	Not evaluated	Not evaluated	Not evaluated
Article First Author and year	Distractions and Interruptions	Nurses' perception of distractions	Medication administration errors
6. Sheryl Keiffer (2015)	Decreased	Decreased	Decreased
7. Kelly Kollstedt (2019)	Not evaluated	Decreased	Not evaluated
8. Cintia Monteiro (2015)	Not evaluated	Not evaluated	Not evaluated
9. Simon Kreckler (2008)	Not evaluated	Not evaluated	Not evaluated

10. Lily Thomas (2017)	Decreased	Decreased	Not evaluated
11. Erik Wolak (2017)	Decreased	No statistical difference	Not evaluated
12. Mindy Yoder (2015)	Decreased	No statistical difference	Decreased
13. Mazdak Zaman	Decreased	Not evaluated	Decreased

Appendix D

Zone of Silence Stop Sign

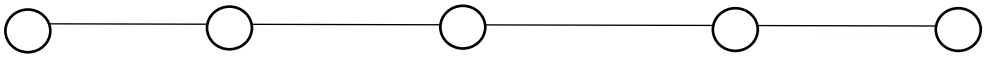
Appendix E

Likert Scale Surveys

Distractions in the NICU for RNs

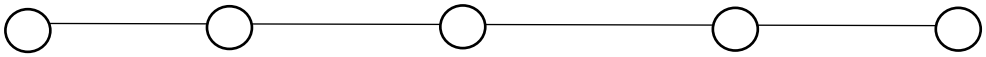
Please respond to the following statements with your level of agreement:

1. I am often faced with distractions and interruptions while I am getting ready to administer Expressed Breast Milk to a patient.



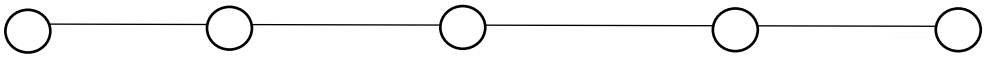
Strongly Agree Agree Neither agree nor disagree Disagree Strongly disagree

2. I have witnessed other nurses being interrupted during administration of EBM.



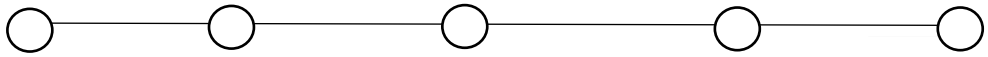
Strongly Agree Agree Neither agree nor disagree Disagree Strongly disagree

3. Parents frequently distract me or other nurses during administration of EBM.



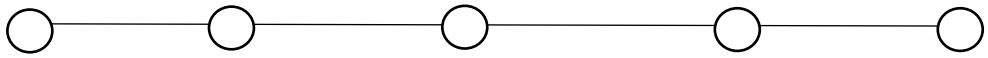
Strongly Agree Agree Neither agree nor disagree Disagree Strongly disagree

4. Other nurses frequently distract me during administration of EBM.



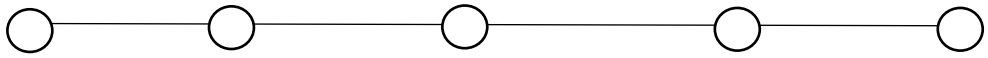
Strongly Agree Agree Neither agree nor disagree Disagree Strongly disagree

5. Doctors/Nurse Practitioners frequently distract me during administration of EBM.



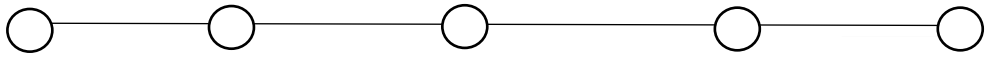
Strongly Agree Agree Neither agree nor disagree Disagree Strongly disagree

6. I have $\leq$ 3 distractions or interruptions during each feeding time.



Strongly Agree Agree Neither agree nor disagree Disagree Strongly disagree

7. I have $\geq$ 3 distractions or interruptions during each feeding time.



Strongly Agree Agree Neither agree nor disagree Disagree Strongly disagree

Please add any comments below. You may want to include during which feeding times you face most distractions and interruptions, any sources of interruption or distractions you face during feeding times that were not mentioned in this survey, and any suggestions to decrease level of distraction during administration of EBM.

_____

_____

_____

Appendix F

Secret Shopper Surveys

Feeding Time	# of RNs Observed	# of Distractions Observed	# of RNs that utilized Zone of Silence
9:00am/pm		RN 1 RN 2 RN 3 RN 4 RN 5	
12:00am/pm		RN 1 RN 2 RN 3 RN 4 RN 5	
3:00am/pm		RN 1 RN 2 RN 3 RN 4 RN 5	
6:00am/pm		RN 1 RN 2 RN 3 RN 4 RN 5	

Sources of Distractions/Interruptions Observed:

Feeding Time	9:00am/pm	12:00am/pm	3:00am/pm	6:00am/pm
Parents				
Nurses				
Doctors				
Nurse Practitioners				
Respiratory Therapists				
Telephone Calls				
Issues with Cerner or Bridge				
Other				

If selected Other, please explain the distraction observed:

_____

Appendix G

Timeline for completion:

February-April 2021

- February - March 5, 2021 - Complete proposal draft
- February – March – Identify practice mentor
- March 6, 2021 - April 4, 2021 – Complete written proposal
- March 20, 2021 - April 8, 2021 – Complete oral proposal
- April 2021- Present proposal
- April 2021 – present proposal to hospital stakeholders and acquire appropriate approval for DNP project implementation. Establish all resources and ethical merit.

May – July 2021

- Prepare for implementation, present posters and education to staffing, select project champions, and collect baseline data

August-December 2021

- Implement project
- Track changes from project plan

January-April 2022

- January – February - Display data and project outcomes, report evaluation of the effectiveness of the practice change. Identify final resources used to implement project and report the return on investment
- Present DNP Project!

Appendix H

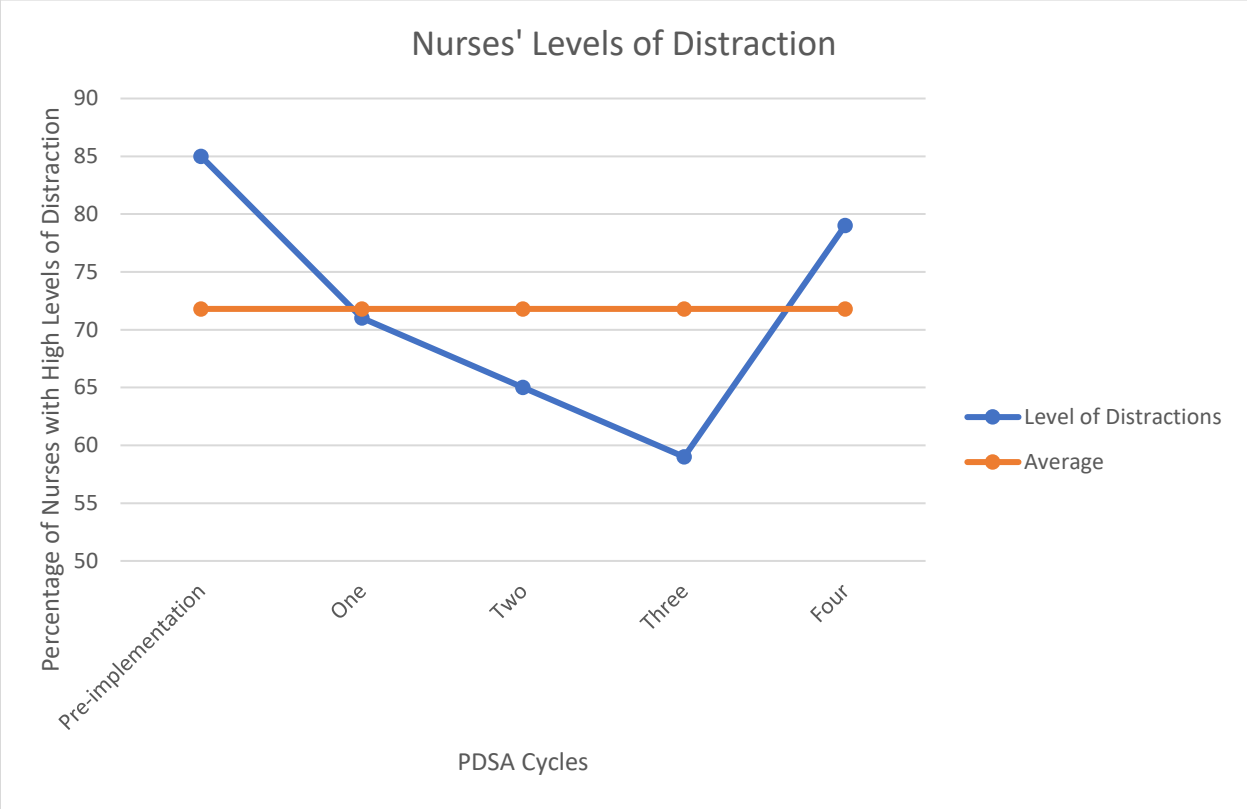
Ethical Merit

Differentiating Quality Improvement and Research Activities Tool

Question	Yes	No
Is the project designed to bring about immediate improvement in patient care?	X	
Is the purpose of the project to bring new knowledge to daily practice?	X	
Is the project designed to sustain the improvement?	X	
Is the purpose to measure the effect of a process change on delivery of care?	X	
Are findings specific to this hospital?	X	
Are all patients who participate in the project expected to benefit?	X	
Is the intervention at least as safe as routine care?	X	
Will all participants receive at least usual care?	X	
Do you intend to gather just enough data to learn and complete the cycle?	X	
Do you intend to limit the time for data collection in order to accelerate the rate of improvement?	X	

Adapted from Foster, J. (2013). Differentiating quality improvement and research activities. Clinical Nurse Specialist, 27(1), 10–3. https://doi.org/10.1097/NUR.0b013e3182776db5

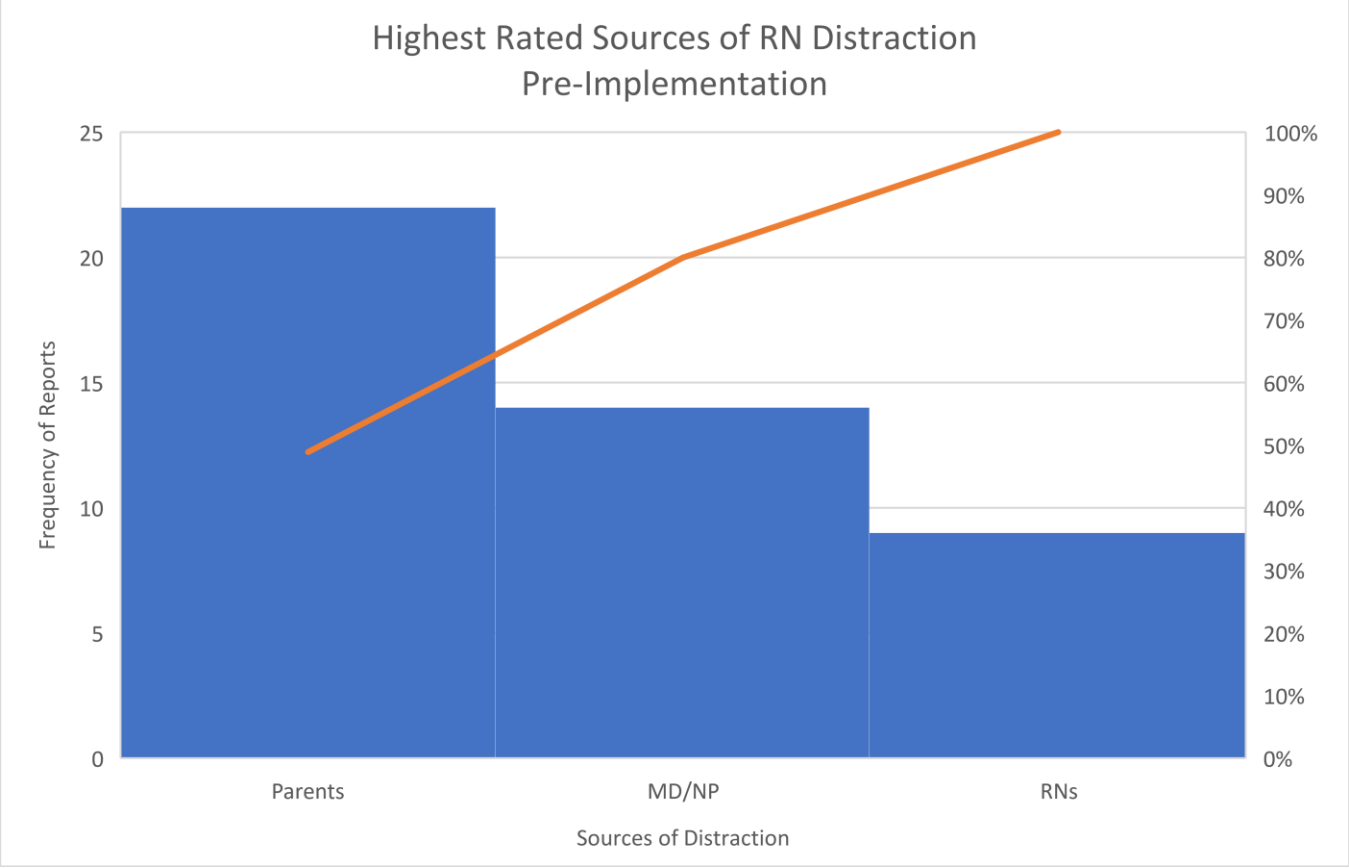
Appendix I

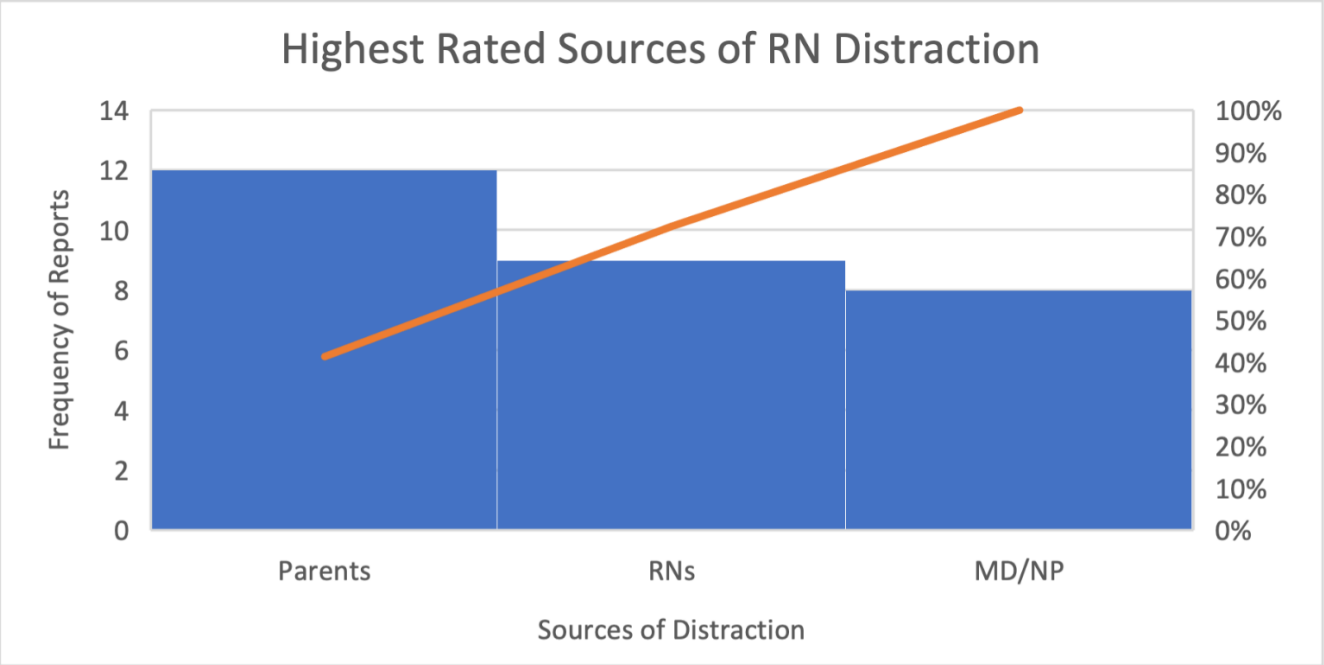


This run chart shows the percentage of nurses that strongly agreed or agreed with being faced with distractions “often” while administering EBM in the NICU. The data was collected from the pre-implementation phase through the fourth PDSA cycle of the QI project.

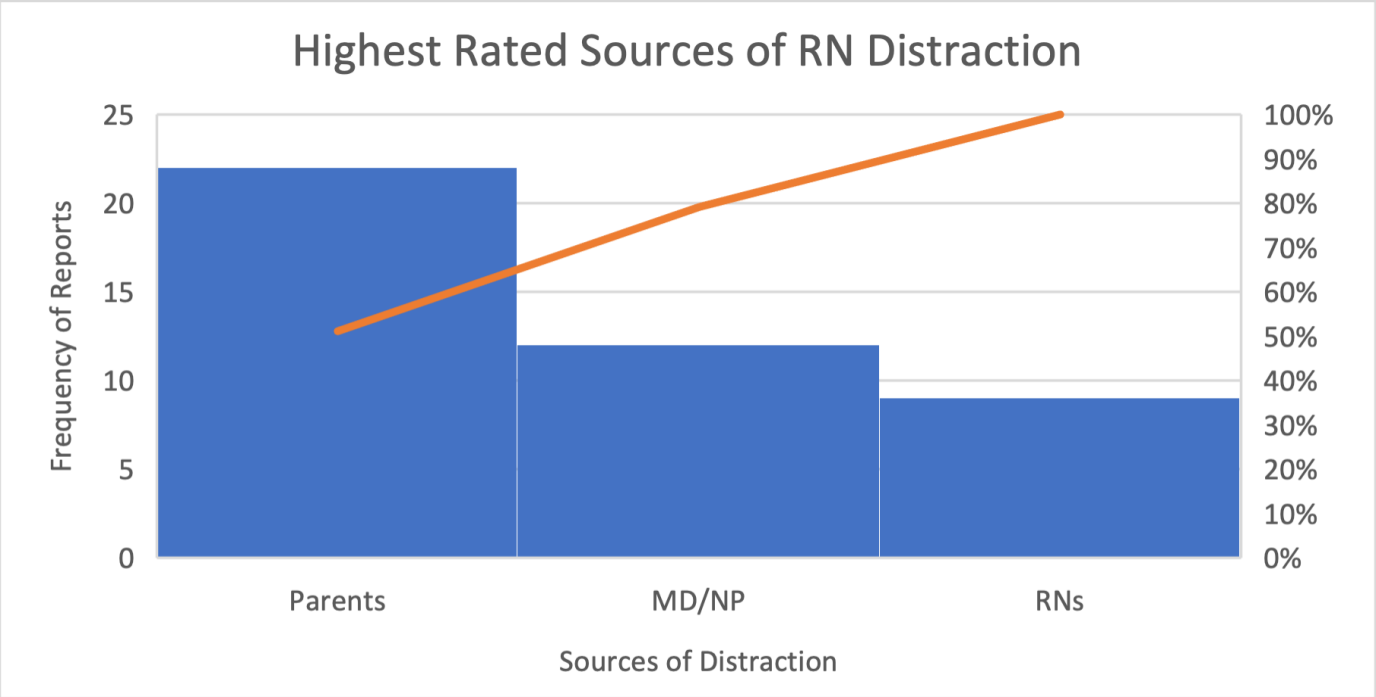
Appendix J

The following five pareto charts display the greatest reported sources of distraction by RNs in the NICU, as well the frequency and percentage of RNs that reported these sources as the most distracting. Each chart displays data from one of the five total phases of the QI project from pre-implementation to PDSA cycle four.

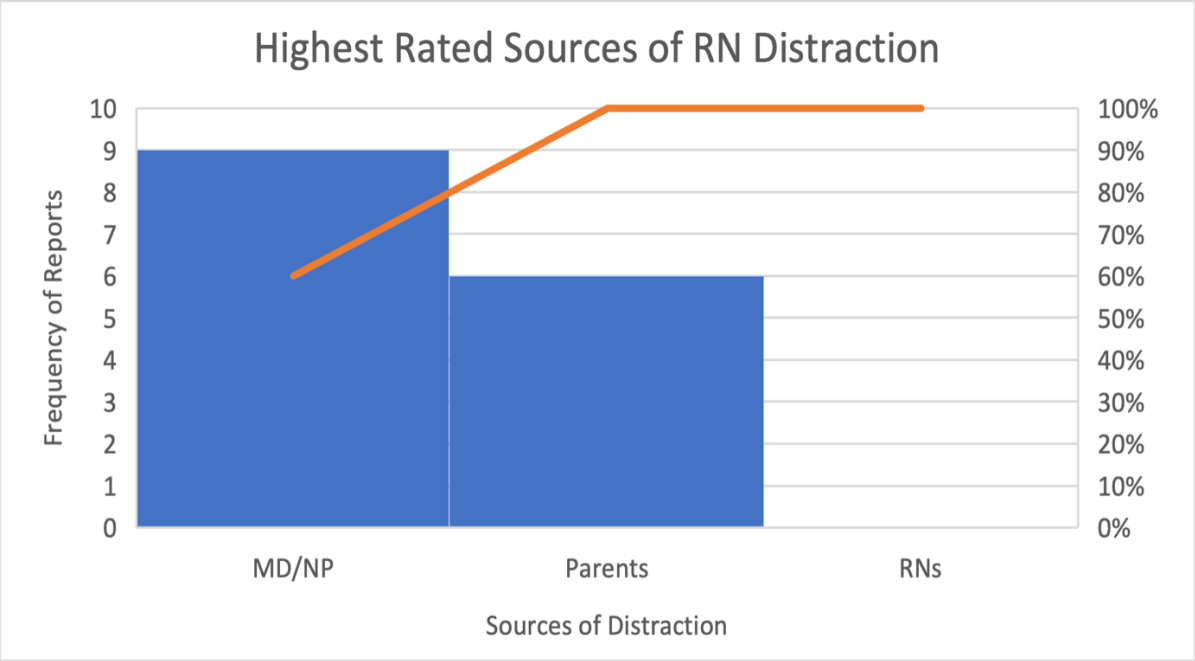




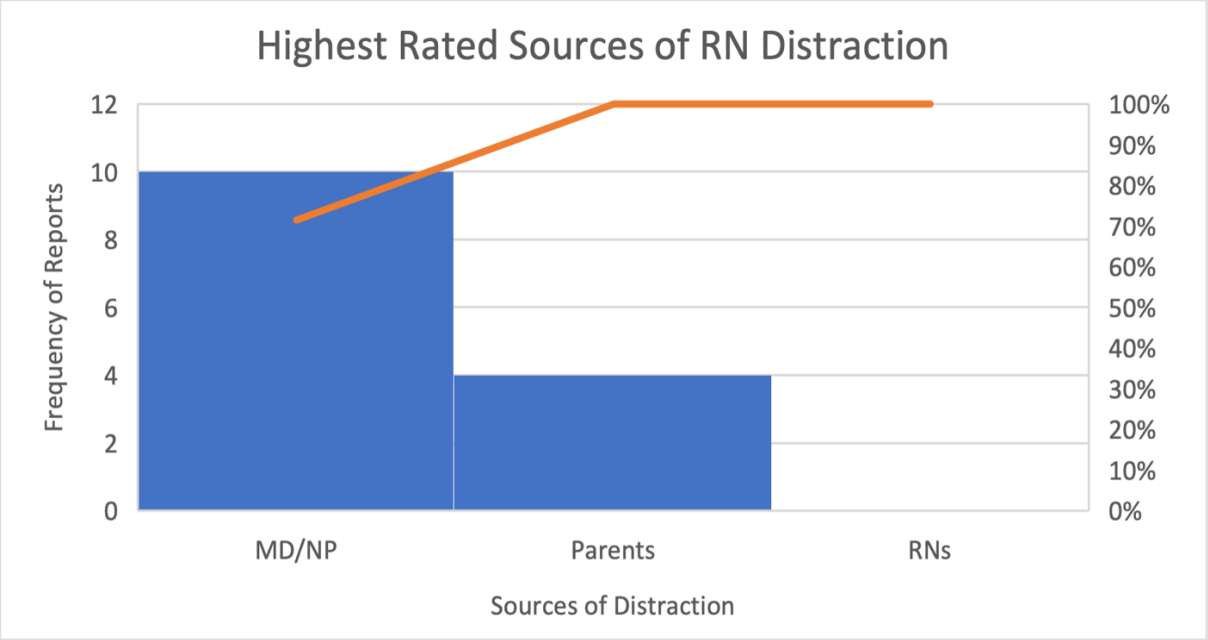
PDSA Cycle 1



PDSA Cycle 2



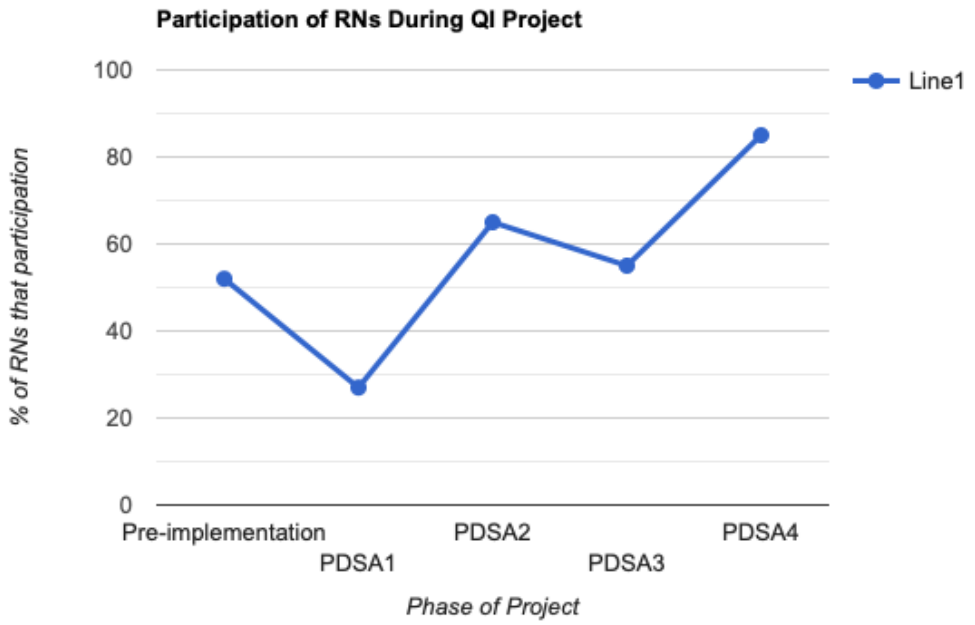
PDSA Cycle 3

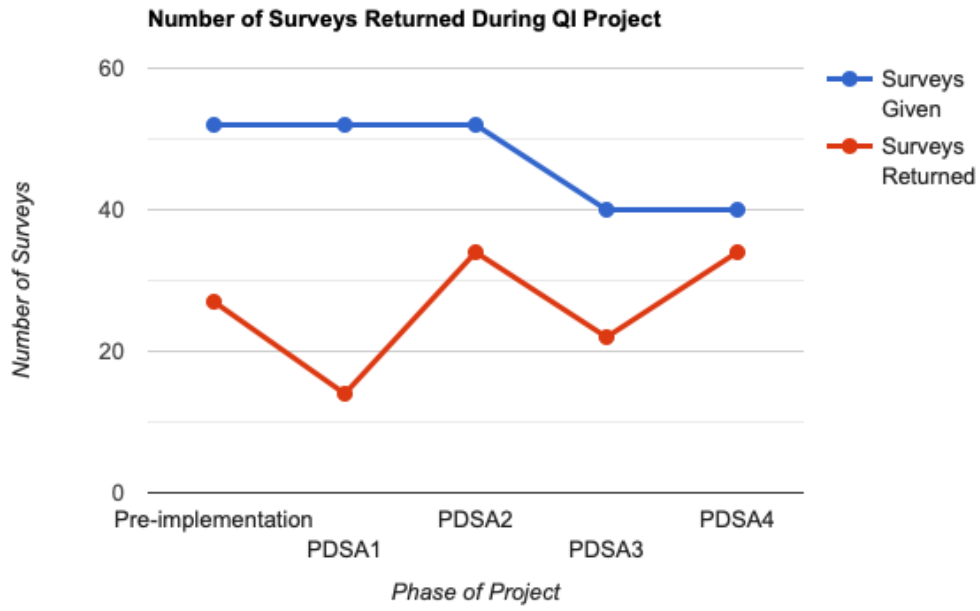


PDSA Cycle 4

Appendix K

The following line charts display the percentage of RNs that participated in each phase of the project. The number of surveys given and the number of surveys returned for each phase of the project is also shown.





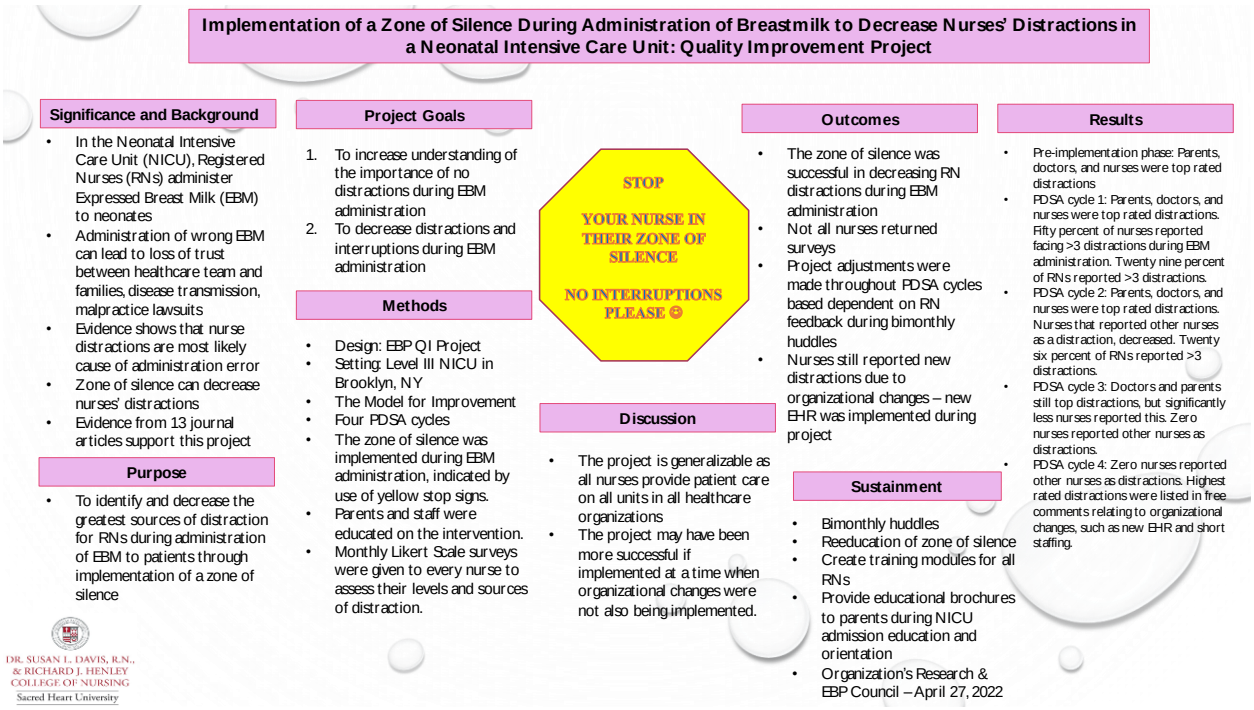
This figure shows the same data – the number of nurses given surveys and the number of surveys returned throughout the course of the project.

Likert Scale Surveys Completed

Pre-implementation phase		
Number of nurses that received surveys	n=	52
Number of surveys that were returned	n=	27
End of month one		
Number of nurses that received surveys	n=	52
Number of surveys that were returned	n=	14
End of month two		
Number of nurses that received surveys	n=	52
Number of surveys that were returned	n=	34
End of month three		
Number of nurses that received surveys	n=	40
Number of surveys that were returned	n=	22
End of month four		
Number of nurses that received surveys	n=	40
Number of surveys that were returned	n=	34

Appendix L

Poster



SHU Digital Repository Checklist

		Yes	No
1.	This is my final DNP project paper that has been approved by my DNP project faculty advisor and practice mentor.	X	
2.	I have deidentified the practice setting and the individuals involved in the project in my DNP project paper.	X	
3.	I do have plans to publish my project. *If select yes, answer question #4*		X
4.	I agree to upload my DNP project to the SHU DHCON digital repository under the Creative Commons license Attribution-NonCommercial-ShareAlike 4.0 International See for license information https://creativecommons.org/licenses/by-nc-sa/4.0/		
5.	*You answered yes to question 2;* Select the type of embargo *[a period that SHU digital repository will not allow access to your full paper].*	9 months	12 months