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## Evaluation of Nurses' Knowledge of "Period of PURPLE Crying" Program: Shaken Baby Syndrome Prevention

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Cynthia L. Brubaker-Vincent, Student

Dr. Leslie Scott, Advisor

RUNNING HEAD: Evaluation of Nurses' Knowledge of "Period of PURPLE Crying" Program

DNP Project Inquiry

Evaluation of Nurses Knowledge of "Period of PURPLE Crying" Program:

Shaken Baby Syndrome Prevention

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The University of Kentucky

April 19, 2016

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### **Abstract**

Shaken baby syndrome (SBS) and pediatric abusive head trauma (PAHT) continue to be the leading cause of child abuse death and most common causes of mortality and morbidity due to the physical child abuse in the United States (Barr, 2014). According to the CDC of the nearly 2,000 children who die from abuse each year, PAHT and SBS are responsible for 10-12% of those fatalities (CDC, 2015). There are 1450-1700 cases of reported shaken injuries to infants and children reported in the United States each year (Barr, 2014). Shaken Baby Syndrome is 100% preventable through the proper education to our medical professionals, who then individually educate new parents about the risks, dangers, and needless consequences (Barr, 2014). Infant crying is the primary stimulus of a potential shaken injury, as it relates to the stress and coping mechanism of new parents and caregivers. Primary care providers must work to help educate our new parents and caregivers about these horrible needless injuries (Barr, 2014). To encourage injury prevention, a survey to evaluate the knowledge of staff nurses was developed and was distributed to the staff at St. Claire Regional Medical Center in Morehead Kentucky. The staff nurses in the emergency room, the obstetrics department and the medical-surgical floors, are the participants who individually completed the surveys. The survey is an evidence-based practice tool to evaluate what is needed to educate the "future educators" of our new parents. This survey was created to evaluate a nurse's knowledge about an already developed educational tool to equip new parents with upon discharge from this hospital. The tool is used to educate a new mother and father as they are being discharged from a hospital setting with their new baby. The Period of PURPLE Crying program is about infant crying, when, how, why it happens and how to cope with it (Barr, 2014).

## **Introduction**

Shaken baby syndrome (SBS) and pediatric abusive head trauma (PAHT) continue to be the leading cause of child abuse death and most common causes of mortality and morbidity due to physical child abuse in the United States (Barr, 2014). The data indicates 1,000 to 1,500 infants per year are shaken, and sustain a head injury. According to the information from the Centers for Disease Control and Prevention, of the nearly 2,000 children who die from abuse every year, PAHT, or SBS are responsible for 10 percent to 12 percent of those fatalities (CDC, 2015). Research also indicates that there is a strong relationship between poverty and child abuse (CDC, 2015). Loss of employment, home foreclosures and general lack of money to buy food and pay bills mean an increase in stress, an increase in the number of children who live in homes below the poverty level, and an increase in the risk of child abuse (Barr, 2014). Through education to healthcare providers, nurses, NPs, and even Physicians, there will be a greater level of cohesiveness providing education to new parents before and after the delivery of their new baby.

## **Background**

A significant proportion of cases of SBS/AHT, about 18-40%, will die during the initial phase of hospitalization from their injuries (Don't Shake .gov, 2012). Even though SBS/AHT has been recognized for over 40 years, SBS/AHT is and can be 100% preventable with education. Survivors of SBS/AHT do very poorly, from a study in Japan found only about seven percent of the survivors were reported as "normal," and twelve percent were in a coma or vegetative state in the hospital, sixty percent had a moderate or greater degree of disability, related to the injury. Lasting neurologic deficits affected 55% of survivors; 65% had visual

impairments, and 85% may require ongoing multidisciplinary care for the rest of their lives (Fujiwara, 2012). The negative effects following hospital discharge are likely to be underestimated, because it would take several months to years before the full impact of the neurologic and/or developmental difficulty becomes apparent in any one baby or child (Barr, 2010). Through education, and educational tools, prevention of this violent act of child abuse can be prevented. There are several programs developed and available for distribution to our birthing facilities and hospitals in the United States. The awareness and availability are key to the success in educating our nurses.

The "Period of *PURPLE* Crying" program is designed to help parents of new babies understand a developmental stage that is not widely understood. The program provides education on the normal crying curve and the dangers of shaking a baby. Additionally, the program tries to create a cultural change in how parents, caregivers, and everyone in the community understand the normalcy of this early infant crying and the dangers of reacting in frustration to an infant's crying in frustration. The program is based on 30+ plus years of scientific research on infant crying, the connection between the crying curve and the incidence of SBS. The program has undergone extensive evaluation with randomized controlled trials with 4400 participants and 32 parent focus groups (Barr, 2014). In order to achieve consistent results, the program is delivered using a very specific protocol (Barr, 2014). The types of services offered include an educational video and booklet about coping with infant crying and prevention of Shaken Baby Syndrome. The program has been translated into 10 languages and includes closed caption for the hearing impaired to assure that parents receive culturally appropriate materials in their native language (Barr, 2014).



The education that could be a requirement as a nurse in a birthing facility as a primary patient education advocate is essential as a starting point for the future. A nurses' ability, and understanding of this specific educational tool, can be vital in discharge teaching. Before a new mother takes her new baby home from the hospital it is essential that she have this education, it may prevent SBS in the future. As staff nurses are providing education throughout a new mother's stay in a facility, in birthing classes prior to delivery, and in discharge teaching at the end of a hospital stay, for about 30-45 minutes depending on the patient situation, the nurse can make sure parents are aware of the vital basic concepts of this program. The addition of this tool may add 5-15 minutes to discharge teaching, and yet add knowledge for parents to help them cope with a crying baby. It is imperative that nurses have basic understanding of colic, infant crying, shaken baby syndrome, soothing techniques, and safety guidance, and they can provide the needed knowledge to our patients.

### **Objectives**

- Evaluation of nurses' current knowledge of Shaken baby syndrome (SBS) and Pediatric abusive head trauma (PAHT).
- Evaluation of nurses' knowledge of crying, colic, and how it relates to potential shaken injuries.
- Evaluation of nurses' understanding and level of knowledge about the "Period of PURPLE Crying" program content.

- Evaluate the staff nurse's current knowledge about infant crying and the strategies to prevent SBS through a 'RedCap' survey questionnaire.
- Evaluate the effectiveness of "The Period of PURPLE Crying" training on the nursing staff by administering a pre-test/post-test of the material presented to assess change in their knowledge after viewing the material.

### **Identification and Description of the Issue**

Shaken Baby Syndrome (SBS), a leading cause of child mortality, 100% preventable (Barr, 2014). There is a need for a strategy to prevent SBS through appropriate and thorough education when a new baby is born to first-time parents. There is a significant unrealized potential for caregiver education (Barr, 2009). Many caregivers generally do not understand that prolonged and inconsolable infant crying is common in a normal infant. Caregivers also remain unaware of strategies for coping with prolonged crying episodes. Educating caregivers and new parents about normal infant crying, the dangers of shaking a child, and coping strategies can help address the problem (Barr, 2009). A relationship needs to be established with new parents to help them cope and understand infant crying, through the development of educational materials, and clinical interactions. Such innovations have been designed with a video, leaflet, and training information readily available to be distributed to the general public with the right initiative (Barr, 2014).

Shaken baby syndrome is a severe form of child abuse caused by the violent shaking of an infant or child (CDC, 2015). Shaken baby syndrome can occur from as little as 5 seconds of shaking. Shaken baby injuries occur in children younger than 2 years of age but may be seen in children up to the age of 5 years. When an infant or toddler is shaken, the brain bounces back and forth against the skull. This can cause bruising of the brain, called cerebral contusion. The

bouncing can also cause swelling, pressure, and bleeding in the brain. The large veins along the outside of the brain may tear, leading to further bleeding, swelling, and increased pressure inside of the skull. All of this can easily cause permanent brain damage or death. Shaking an infant or small child can cause other injuries also, such as damage to the neck, spine, and eyes (nih.gov, 2011). Among those that survive, approximately 80% suffer permanent disability such as severe brain damage, blindness, cerebral palsy, mental retardation, behavioral disorders, and impaired motor and cognitive skills (National Center on Shaken Baby Syndrome, 2012).

Shaken baby syndrome (SBS) occurs in an estimated 30 out of 100,000 children under the age of one (Barr, 2009). Approximately 25% of all victims die as a result of their injuries, making it one of the leading causes of child abuse mortality in the United States today (National Center for Shaken Baby Syndrome, 2012). The financial implications are high because when a child survives a traumatic brain injury, they may sustain life long physical and mental disabilities that can be very costly (Barr, 2012). The damage caused by trauma to the head per infant for nonfatal injuries is estimated to cost \$210,000 on average, and \$1,272,900 per fatal injury reported (Barr, 2012).

### **Innovation**

Shaken baby syndrome is relevant to nursing practice because, the nursing profession has a fundamental role in the educating of new parents, in the hospital and in primary care settings. It can be prevented through education that crying is a normal process and occurrence for any infant, baby and toddler, and they should never be shaken because of said crying. Also, if a shaking injury should occur, seeking immediate medical treatment is important for survival, due to the life-threatening nature of a shaking injury (AHRQ, 2013). Through the AHRQ Health Care

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Innovation Exchange, a profile was identified: Educational Materials Enhance the Ability of New Parents to understand and Cope with Infant Crying. The Innovation was first implemented in 2007. The patient population was for newborns, 0-1 month, and infants, 1 month to 23 months. The developing organization was The National Center on Shaken Baby Syndrome. The International Prevention Director, the actual Innovator, is Julie Price. The educational website has a taped interview with Dr. Ronald Barr. He is one of the leading Developmental Pediatricians that does research on SBS, and the "Period of PURPLE Crying" program (AHRQ, 2013). The program materials, which include a 10 minute DVD and an 11 page booklet:

(Added as Appendix B).

1. Are educational and attractive to parents of newborns on the first day of life;
2. Contain clear, memorable, meaningful, attractive, positive messages;
3. Are written at a third grade reading level;
4. Are intended to be multicultural both through translation and the visuals;
5. Are designed to be acceptable to public health nurses (i.e. no bottles, blankets, bumper pads, etc.);
6. Are provided free of charge (cost of the program is covered by the organization delivering the program) and parents have a copy, so that they can review it when needed to share the materials with others who may care for their child (Barr, 2014).

Much knowledge to a new eager mother's mind, and support the future growth of an infant/baby/child, because Shaken Baby syndrome (SBS) is 100% preventable through education.

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- The "Period of PURPLE Crying" program education is delivered to parents and caregivers usually by health professionals who are trained to deliver the program and answer the parents' questions. This is done to ensure that everyone receives the same information. So first things first, OUR nurses need the knowledge to share this information.

The educational materials are called "The Period of PURPLE Crying" program. The acronym PURPLE stands for:

**P**-Peak of crying; *Your baby may cry more each week, the most in month 2, then less in months 3-5.*

**U**-unexpected; *crying can come and go and you don't know why.*

**R**-resists soothing; *your baby may not stop crying no matter what you try.*

**P**- pain-like faces; *a crying baby may look like they are in pain, even when they are not.*

**L**-long lasting; *crying can last as much as 5 hours a day, or more.*

**E**-evening; *your baby may cry more in the late afternoon and evening.*

These materials are distributed to new parents by their clinicians and other service providers. The materials consist of a video and a booklet that can help new parents and caregivers understand and safely cope with infant crying, which is the most common trigger for shaken baby syndrome (dontshake.org, 2012). The cultural implications that can be addressed with these materials are vast, because the "Period of PURPLE Crying" program is currently available in 10 languages in addition to closed caption for the hearing impaired. An interpreter can be contacted for languages that are not currently available in the program.

These materials describe normal infant crying, explain the easy-to-remember acronym PURPLE (with each letter standing for various features of infant crying), suggest strategies for comforting a baby, acknowledge caregiver frustration when a baby cannot be soothed, explains the dangers of shaking the infant, and outlines several positive approaches for handling an inconsolable infant. Materials are distributed to new parents by their discharge nurse, or labor & delivery nurse prior to discharge from hospital or birthing center ([www.purplecrying.info/](http://www.purplecrying.info/), 2012). Multiple studies show the program increased mothers' knowledge about infant crying and shaken baby syndrome and enhanced the likelihood of such knowledge being shared with others. It also enhanced the ability of mothers' to deal appropriately with distressed, crying babies (Barr, 2009). The profile also discussed pediatricians, public health workers, adoption agencies, and other organizations that would interact with new parents, distribute these materials and reinforcing the messages. Nurse practitioners were not mentioned as a subgroup yet, but I could be the driving force behind a public health educational campaign to prevent shaken baby syndrome.

### **Outcomes**

The desired outcomes is that babies can be discharged from a hospital, go home and be raised in a safe and knowledgeable living environment without being harmed for any reason, especially from a shaking injury due to crying issues. The education of new ideas and concepts, how to cope with stress, and how to care for a new infant, is and can be very overwhelming to many. Conflict resolution at the smallest level involves teaching skills. If this subject is made to be an organizational priority, it can then be filtered out into the Meso-system, through regional health networks.

Another aspect of concern is our ever growing poverty level, and how that will also impact our new parents who struggle with financial issues day in and day out. The growing issues of babies born to drug addicted mothers in Kentucky and nationwide is a huge area of concern also. The components of this specific program have been tested and researched and have undergone extensive evaluation with randomized controlled trials with 4400 participants and 32 parent focus groups. Therefore, in order to achieve consistent results, this specific program is delivered using a very specific protocol.

The "period of PURPLE Crying" program materials is a 10 minute DVD and 11 page booklet. The booklet is: attractive and educational to parents of newborns on the first day of life, they contain clear, memorable, meaningful, attractive, positive messages, they are written at a third grade reading level, is intended to be multicultural both through translation and the visuals, is designed to be acceptable to public health nurses, are provided free of charge, (cost of the program is covered by the organization delivering the program) and parents have a copy, so that they can review it when needed and share the materials with others who may care for their child.

### **The Change Theory by Kotter**

The Change Theory that best accomplishes the goals of this innovation implementation is the Eight-Stage Change Process of Creating Major Change by Kotter:

- 1). Establish a sense of urgency has been addressed in addressing the issue of prevention of SBS.
- 2). Creating the guiding Coalition by putting together a group with enough power to lead the change has been established for this project by including the charge nurse, and CNO of St. Claire's Regional Medical Center in Morehead Kentucky.
- 3). Developing a vision and strategy to help direct the change effort, this has also been the

driving force by preventing ever case of SBS through education.

4). Communicating the change vision, using every vehicle possible, (all the OB/nursery staff), to constantly communicate the new vision and strategies.

5). Empowering broad-based vision, get rid of obstacles, encourage risk taking and nontraditional ideas, activities, and actions.

6). Generating short-term wins, visibly recognizing and rewarding people who made the wins possible.

7). Consolidating gains and producing more change. Using increased credibility to change all systems, structures, and policies that don't fit together and don't fit the transformation vision. It is suggested that, if we can change the nursery with the educational tools, the primary care health care delivery systems will be very willing to change and also support the innovation to prevent anymore Shaken Baby incidents through education.

8). Anchoring new approaches in the culture, by developing means to ensure leadership development and succession (If you build it, they will come) (Kotter, 2002). There is great confidence that through these eight stages of change, that 4-5 of them have already been addressed in the progress of having an innovation already developed, having a macro system that I already am presently involved and employed by, and the overwhelming determination I have to make it something that happens in the near future (Kotter, 2002).

### **EBP Implementation Framework**

A Model of Evidence-Based Practice for Individual Practitioners was utilized. A model adapted from Haynes and colleagues (2002), with the use of research findings in the context of an evidence-based decision-making framework (DiCenso, Cullum, Ciliska, & Guyatt, 2004).

Evidence-based decision making is the integration of best research evidence with the patient's



clinical status and circumstances, the patient's preferences and actions, healthcare resources, and clinical expertise when deciding on interventions or the type of care to deliver (DiCenso, Cullum, Ciliska & Guyatt, 2004). According to Dicenso, (2004), Evidence-based practice includes the following processes:

- Formulating a clinical question;
- Systematically searching for relevant research evidence;
- Critically appraising the relevance, quality, and applicability of the evidence;
- Making an evidence-based decision regarding implementation;
- Implementing the practice change;
- Evaluating the change in practice.

### **Implementation Plan**

To start the implementation plan, each area of the evidence-based decision making model needs to be established related to the Period of PURPLE program, discussed from the Innovations Exchange at AHRQ. The center core of model is Clinical Expertise, which falls to the RN, or even APRN who would interact with new parents to introduce the Period of PURPLE program. Through the expertise of clinical staff, and the materials that are provided through the Period of PURPLE crying program, we as an organization can educate our new parents. With this intervention, we attempt to prevent unnecessary shaking incidents in our communities by increasing knowledge of infant crying, by improving coping strategies, and by giving support that potentially can make a huge impact in public health (AHRQ, 2012).

### **Study Design**

The survey that was utilized, analyzed the knowledge of the nursing staff in Nursery/OB, Emergency, Pediatric departments on the topic of infant crying Shaken baby syndrome. A cross sectional survey was conducted with the staff nurses at St Claire Regional Medical Center in Morehead Kentucky. The cross sectional design used, was via email with 'Redcap' distribution. Their participation was anonymous and voluntary. IRB approval was obtained from St. Claire's Regional Medical Center and the University of Kentucky ORI office.

### **Study Population**

There were 21 participants who responded from the hospital nursing staff in three departments that deal directly or indirectly with infants, and their new mothers, would be capturing about 20% of the staff. The goal was to involve a large enough group to effect change in the knowledge about infant crying, and how it relates to shaken baby syndrome. The number of staff nurses from St Claire's Regional Medical Center is a combination from; the newborn nursery/OB unit, the emergency department and from the medical-surgical department. Inclusion criteria: Nurses must be employed at St. Claire's Medical Center in Morehead Kentucky. They must work directly with patient population, infants, and their parents. Exclusion criteria: Non-English speaking nurses, Nurses in departments that do not provide care to the specific population of patients. This facility implemented the "Period of PURPLE Crying" program about 8-10 months ago, in a rural hospital in Eastern Kentucky. This facility averages 400 deliveries/year; with a level #1 nursery. No post-implementation evaluation of nurse knowledge of the "Period of PURPLE Crying" program conducted to date.

### **Subject Recruitment Methods and Privacy**

The identification and recruitment of said subjects for this survey of knowledge will come from the Managerial components, Lerae Wilson, DNP, RN, CNO; OB/Nursery Interim Manager, ER Manager, and Pediatric Med/Surgical Manager. The nurses were recruited via email from the assistant to Dr. Lerae Wilson, with an email with link to 'RedCap' that has been described. A follow-up e-mail will be sent weekly if less than 5 respond from each unit. A third e-mail will be sent at 3 weeks and then the final report was analyzed for the purpose of this inquiry project.

### **Informed Consent Process**

Consent of the survey came if they complied and provided information in completed survey. I would like to believe that nurses in a said unit that interact with these types of patients, would want to learn and grow from new avenues of information that is evidence - based. Changing a practice of a population takes many steps. Asking permission of each individual staff nurse is possible and will be done if it is deemed necessary. This should not be necessary in an anonymous, voluntary situation.

### **Process Evaluation**

Fidelity: Nurses adhere to the components of the educational program and it will be 80% or greater.

Dose: 100% of the staff in Newborn/OB will receive every component of the education according to the protocol, as it relates to risk assessment, referral, counseling, and follow-up.

How much of the educational intervention is delivered? With a survey, post-test, or questionnaire

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to the staff nurses that viewed the "Period of PURPLE Crying" program education, I can measure and evaluate the amount of knowledge that was obtained from the lesson.

Reach: 100% of the staff who will be educating the parents of new babies will receive the education, and perform that education under these specific protocol guidelines set forth from the Shaken Baby Center who designed the PURPLE program. For the educational intervention to the staff in said newborn nursery, the proportion should be large, since it will be a work related requirement to implement educational tool to the patients into discharge teaching. The patient side will have a high proportion of reach also, because eventually it will be a requirement to view education to take infant home from hospital. Calculating the reach will be based on chart audits, and follow-up surveys about the addition of the program to the discharge teaching at said facility.

**Did the** education of the crying program increase the knowledge of infant crying for the staff?

**Did the** education of the crying program increase the awareness of infant crying in the parents?

**Did the** "period of PURPLE Crying" program support the importance to the parents/staff why we NEVER shake a baby?

**Did the** Program give reinforcement to the parents/staff that asking for help or putting baby down in a safe place and walking away when frustrated is okay? (It is okay to walk away from a crying baby is an understood concept after watching the program video).

### **Potential Risk**

There is minimal risk to participants due to the anonymous survey through Redcap. If participants are affected by the difficulty of reading hard questions, they are advised to stop survey if it makes them uncomfortable. The potential emotional distress to staff nurses is that

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thinking about infant crying and the potential injuries. Emotional stress related to the questions.

There is a minimal risk

### **Safety Precautions**

Protect data in Redcap program on computer, password protected. Any paper data will be kept locked. Risk to confidentiality is minimal. Data will be stored in Redcap, and there will be no names to the survey questions, and they are voluntary and anonymous. Provisions will be taken to monitor the data collected and safety to subjects will be protected.

### **Benefit vs. Risk**

There is a minimal risk to subjects who answer surveys, vs. the gain in knowledge to help facilitate a greater prevention of shaken baby syndrome through implementation of the new program.

The benefit of the evaluation of Nurse's knowledge in this facility far-out weighs the risk due to the needed data to support to incorporate the new education throughout this rural hospital for a program that has already been implemented. Evaluating the units knowledge to each other will show how much better suited they will be with the program, the "period of PURPLE Crying" to help educate their population in the future. Shaken Baby Syndrome is 100% preventable with the proper education to our parents. Crying is the number one stimulus to cause a shaken injury. The risks of this survey are so minimal, and people have not had proven issues with answering survey questions be a risk to themselves. The benefit of the data is great.

### **Research materials, records and privacy**

All of this has been explained prior to this section. Confidentiality is protected due to anonymous survey questions through Redcap, records of that survey will be safe and protected in the Redcap program to be analyzed, and the research material is 56 survey questions. The survey questionnaire is attached as appendix.

### **Incentives and research related Costs**

There will be no cost to participants to do survey and there was a minimal incentive to do survey other than help their fellow man to evaluate their knowledge. The costs of the project have been to the PI, Cynthia Brubaker-Vincent, as she is a full-time graduate student doing this project to complete her DNP education.

### **Confidentiality**

Data will be stored in Redcap and will be password protected. Limited access to the research team of PI and who she shares collected data with as a whole.

### **Research Procedures**

1. The submission of survey to the Nursery/OB, ER, Med/Surgical unit nursing staff.
2. Consent of participants will come from their voluntary submission back of the survey questionnaire.
3. Administer survey via RedCap of knowledge and educational program. (This can be done via email/internet)
4. Collect data via internet
5. Analyze data with SPSS

### **Inclusion Criteria**

- The facility to be evaluated has to have access to the "Period of PURPLE Crying" program.
- The subjects must be employed as a staff nurses in hospital setting at St. Claire's Regional Medical Center in Morehead Kentucky.
- The nurses must presently work on one of three units with access to the "Period of PURPLE Crying" program, they are; OB, ER, Medical-Surgical.
- The nurses must have access to work-email.

### **Exclusion Criteria**

- Non-nursing employee, or staff nurses employed outside of three areas (OB, ER, Med/Surg) are not to participate in survey.
- Anyone with no access to work related email account are not to participate in survey.

### **Procedure**

- IRB approval was obtained by PI Cynthia Brubaker-Vincent BSN RN from St. Claire's Regional Medical Center, through Dr. Weaver.
- 'Redcap' survey developed and sent to nurses via work email.
- Survey was sent out weekly on three separate occasions to over 70+ nurses.
- There are 21 surveys received, 18 met inclusion criteria for participation and analysis.
- Data analysis was performed via SPSS (23) software.

### **Findings – Demographics**

**(See Appendices G for Graphs)**

- 82% of the nurses surveyed were female.
- 71% of nurses surveyed were between the age of 22-40 years of age.
- 100% of the nurses surveyed were Caucasian.
- 94% of staff nurses surveyed were full-time.
- 41% of the nurses surveyed travel < 10 miles to work.
- 12% of nurses surveyed have LPN or Diploma certifications.
- 47% of nurses surveyed have an associate degree.
- 41% of nurses surveyed have BSN or higher education.
- 95% of the nurses surveyed claim nursing is their first choice as a profession.
- 60% of the nurses surveyed have children or have had children that are grown.
- 6-10% of the nurses have grandchildren.
- 70% of nurses stated they have nieces or nephews.
- <45% of the nurses surveyed stated an accurate definition of colic.
- >77% of the nurses surveyed stated that increased crying is the most common stimulus for a shaken injury.
- 55% of nurses did not list correct definition of colic or answer question.
- 30% of nurses admitted they did not know what SBS or PAHT stands for.
- 25% of nurses did not list crying as the #1 stimulus for shaken injury.



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- 16 out of 21 nurses were able to accurately identify the mechanism of injury association with SBS (Rapid acceleration and deceleration of the head as it moves in figure 8 motion).
- Nurses who taught the program content to families answered 75% basic program content questions correctly.
- 15% of nurse participants were able to accurately describe the acronym PURPLE.
- <50% of participants reported correctly that 18-40% of shaken injuries can cause death to an infant.
- 78% of participants were willing to participate in educational program if offered to them in the future.

### **Limitations**

- Small sample size: 21 participants with 18 meeting inclusion criteria.
- Data collection was limited to 21 days of availability.
- Resignation of the manager of OB unit as survey was submitted to staff nurses.
- High "turn-over" rate of obstetric nurses in prime unit where the knowledge should be the greatest.
- Interference with network from "Ransom Virus" during the three weeks the survey was available.

### **Conclusions**

- Nurses --- primarily ADNs. FT, Live locally and have more than 5 years of experience.
- Their basic knowledge of SBS and PHAT was much lower than expected. (60%, and would of expected 80%).
- Unable to ID primary trigger for SBS (25%).

## RUNNING HEAD: Evaluation of Nurses' Knowledge of "Period of PURPLE Crying" Program

- Majority of OB nurses teaching program were unable to state definition of PURPLE acronym (85%).
- Nurses Knowledge in OB dept. was low, even for the nurses who were willing to do survey. Their answers were about 66% correct.
- If the program was taught properly to the nurses, they would have 80% or greater correct answers on the five vital questions.
- Education throughout the medical-surgical staff, and emergency department staff is a great need house wide.
- Need for education of basic information on colic, infant crying and the risks of SBS for staff nurses.
- The need for proper education in this facility with the "Period of PURPLE Crying" program is clinically significant.

### **Future Plans**

We have a long way to go to get the education introduced to the nurses of Eastern Kentucky.

#### Future plans for the education of the nursing staff at St. Claire's Regional Medical Center

- Identify the deficits with the staff nurses knowledge of the "Period of PURPLE Crying" program.
- More formalized training/re-training of the staff.
- To educate the staff nurses in the OB/Nursery department, and house wide.
- Emphasizing the need and significance of the program they are already utilizing and have access to everyday.

## **Appendices**

Appendix A: Survey prepared in Redcap

Appendix B: Program explanation The Period of PURPLE Crying

Appendix C: Crying Knowledge Scales and Shaking Knowledge

Appendix D: Permission through e-mail from the Center for Shaken Baby Syndrome

Appendix E: Permission from CNO Dr. Lerae Wilson DNP at St Claire Regional Medical Center to utilize her nursing staff, who presently educate some patient populations with educational materials provided to them from Norton's healthcare.

Appendix F: IRB approval letter from Dr. Weaver at St. Claire Regional Medical Center

Appendices G: 7 Graphs and Charts of Findings-Demographics

## APPENDIX A

**Listed below is the survey questionnaire that was submitted to staff nurse employees at St. Claire Regional Medical Center in Morehead Kentucky through Redcap as a URL link.**

### Questionnaire for St. Claire's Nurses

Please complete the survey below.

Thank you!

You are being invited to take part in a research study about your knowledge of the "period of PURPLE Crying" program already implemented in your facility. You are being invited to take part in this research study because you are employed at St. Claire's regional medical center and you care for infants and/or their parents and caregivers. If you volunteer to take part in this study, you will be one of about 65 nurses to do so.

The purpose of this study is to evaluate your level of knowledge of the "Period of PURPLE Crying" program and some demographic information to help implement further education to prevent SBS in the future. The person in charge of this study is Cynthia Brubaker-Vincent BSN RN (PI) of The University of Kentucky. She is being guided in this research by Dr. Leslie Scott (Advisor). There may be other people on the research team assisting at different times during the study. Dr. Debra Anderson, and Dr. Karen Butler.

If you decide to take part in the study your responses will be anonymously added to a bank of data and analyzed for future educational tools for the facility. No one will think badly of you or treat you differently if you decide not to take part in the study, because it is anonymous. There is no cost to participate in this study, and not answering the questions will not affect your job status at St. Claire. You do not need to answer all the questions in the survey if you do not wish to. Your information will be combined with information from other nurses taking part in the study. When we write about the study to share it with other researchers, we will not be identified in these write ups.

If you have questions about the study, you can contact the investigator, Cynthia Brubaker-Vincent at [Cynthia.brubaker-vincent@uky.edu](mailto:Cynthia.brubaker-vincent@uky.edu). If you have any questions about your rights as a volunteer in this research, contact the IRB staff at St. Claire Regional Medical Center, 606-783-6520.

Are you willing to participate?

Yes

No

### Demographics

Are you?

RUNNING HEAD: Evaluation of Nurses' Knowledge of "Period of PURPLE Crying" Program

Female

Male

Prefer not to answer

What is your present age?

22-25

26-30

31-40

41-50

51-60

61+

Prefer not to answer

**What is your current education level?**

Diploma

ADN

BSN

MSN

DNP /PhD

Prefer not to answer

**What is your current licensure?**

RN

LPN

APRN

Prefer not to answer

**What is the amount in years you actively have been working as a Nurse?**

less than 1 year

1-3 years

3-5 years

5-10 years

10-15 years

16+years

Prefer not to answer

**What is your ethnicity?**

White/Caucasian

American Indian/Alaskan Native

Hispanic/Latino

Black/African American

Asian

Other or unknown

Care not to respond

**What is your present Marital Status?**

Married living with spouse

Married not living with spouse

Divorced

Widowed

Separated

Never been married

Member of an unmarried couple

Prefer not to answer

**Which nursing unit are you presently employed at St. Claire Regional Medical Center?**

OB/Nursery

Emergency Department

Med/Surgical

Prefer not to answer

**Which of the following statements is true for you?**

Nursing is my first choice as a career.

I love Nursing, but it is my second career choice.

I am considering another career choice.

I am in the process of changing careers.

Prefer not to answer

**Is this job your primary job or secondary job?**

Primary

Secondary

Prefer not to answer

**Work Status?**

Full time

Part time

PRN as needed

Prefer not to answer

**How far do you travel to work at St. Claire Regional Medical Center?**

1-10 miles

11-20 miles

21-30 miles

31-40 miles

41+ miles

Prefer not to answer

**Individual Income?**

\$4999 or less

\$5000 -10,000

\$10,500- \$20,000

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\$20,500 - \$30,000

\$30,500 - \$40,000

\$40,500 - \$50,000

\$50,500 - \$75,000

\$76,000 - \$100,000

Prefer not to answer

**Do you have children of your own?**

No I do not have children of my own.

I do have children under 18 years old

II do have children but they are grown, over 18 years old.

Prefer not to answer

**Do you have grandchildren?**

I do not have grandchildren

Yes I do have grandchildren, and see them regularly

Yes I have grandchildren, but do not see them weekly

Yes I have grandchildren, but do not get to see them very often (monthly)

Prefer not to answer

**Do you have nieces or nephews?**

Yes I have nieces and nephews I spend time with regularly

Yes I have nieces and nephews I do not see often, or spend time with regularly

No I do not have nieces or nephews

Prefer not to respond

**SBS or PAHT**

**Approximately to date, how many cases of (SBS) Shaken baby syndrome or (PAHT) pediatric abusive head trauma do you believe are clinically recognized each year in the United States?**

1000-1200

1200-1400

1450-1700

1750-2000

**Are you aware of the abbreviations PAHT and SBS before reading in a question in this survey?**

Yes

No

**Do you feel you know what the accurate definition of colic is without looking it up?**

Yes

No

**Can you list the definitions here?**

---

**What would you think is the most common stimulus for shaking an infant is?**

Increased crying

Financial stress

Marital stress

Infant illness

**The list below has items that can contribute to a shaken injury, pick all that apply:**

Rapid acceleration and deceleration of the head as it moves in figure 8 motion

Large head to body ratio

Weak neck muscles

Person shaking is more powerful than infant

Violent sustained action

**Outcomes for infants who are taken to the hospital after shaken injury are very poor, what do you think the percent of infants who actually die from shaken injury are today? (pick best guess)**

0-9%

10-18%

19-40%

41-50%

**Of the infants who survive a shaken injury, they have significant long-term neurological and developmental abnormalities, what do you think those percentages are?**

29-39%

40-50%

51-64%

65-80%

**Of the list below what are some of the mild signs and symptoms of a baby who has been shaken: (pick all that apply).**

Trouble sucking or swallowing

Decreased appetite

Trouble sleeping

Increased fussiness

Irritability

Vomiting

Turning blue

Difficulty breathing

Change in level of awareness

Having convulsions

**The perpetrators (about 70%) in most SBS cases are? (pick all that are possible):**

Mother

Father

Grandparents

Other caregivers

**Colic is? Pick all that apply:**

Manifestation of normal behavioral development

An indication of a disease in an infant



Age-dependent crying pattern

Rare and only happens to some infants

**Do you feel that infant crying can lead to a possible shaken injury in an infant?**

Yes

No

**Do you feel that anyone who cares for an infant is capable of committing a shaken injury of an infant in the wrong situation?**

Yes for sure

Yes possibly

Yes, but uncertain why

No, not even possible

**Do you feel that certain infants are more at risk of being shaken than others?**

but uncertain why

not for certain

**If yes or no, can you explain or list some examples for me?**

---

**Of the list below which items can contribute to a shaking injury of an infant? Pick all that apply:**

jogging or bicycling with an infant

Tossing a baby in the air

Sudden stops in a car

Driving over bumps in a car

Short falls

Bouncing a baby on your knee

violent force with whipping motion of their head

**Common sense is important as it relates to caring for an infant.**

True

False

**Anyone can lose control of their temper with an inconsolable crying infant.**

True

False

**Crying in an infant is their only way to communicate their needs.**

True

False

**An infant cannot be spoiled under 6 months of age.**

True

False

**Crying is very healthy and necessary exercise for infants to develop and grow.**

True

False

**Infants can be overstimulated.**

True

False

**Inconsolable crying can possibly continue until infant is.**

2-3 month

4-5 months

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6-8 months

9-12 months

**There is nothing that works all the time to sooth a crying infant.**

True

False

**An infant can be laid down in a safe place and you may walk away.**

True

False

**If soothing your infant is not working something must be wrong.**

True

False

**It is okay to be frustrated from an infant's crying.**

True

False

**It is normal to be afraid to ask for help.**

True

False

**Do you feel knowledgeable about the infant crying concept as it relates to shaken baby syndrome?**

Yes

No

**Any hospital or facility that cares for newborn infants and their parents and caregivers should have a program in place to prevent shaken baby injuries.**

True

False

**What does this program mean to you as a nurse, parent, aunt, uncle or grandparent? (type your feelings please.)**

---

**Existing Program**

**Do you know what the "Period of PURPLE" is?**

Yes

No

**Do you know what the letters of word PURPLE stand for?**

Yes

No

**For each of the letters below, type in the box to enter your response**

What does the P in PURPLE stand for? \_

---

What does the U in PURPLE stand for? \_\_\_\_\_

What does the R in PURPLE stand for? \_\_\_\_\_

What does the P in PURPLE stand for? \_\_\_\_\_

---

What does the L in PURPLE stand for? \_\_\_\_\_

What does the E in PURPLE stand for? \_\_\_\_\_

**The word period in the "Period of PURPLE Crying" means that the crying has a beginning and an end.**

RUNNING HEAD: Evaluation of Nurses' Knowledge of "Period of PURPLE Crying" Program

True

False

**The program, The Period of PURPLE Crying has two aims, Circle two:**

To reduce the incidence of SBS

To support caregivers in their understanding of early increased infant crying

To prevent colic from occurring

To evaluate an educational tool for infant crying

**The "Period of PURPLE Crying" program is an Evidence-Based Shaken Baby Syndrome Prevention program and has been in use since?:**

1. 2000

2. 2002

3. 2005

4. 2007

**Have you participated in a training program for "Period of PURPLE Crying" at St Claire Medical Center?**

Yes

No

**If you do not presently teach the PURPLE program in your unit, do you feel it is important to start?**

Yes

No

**Do you feel that all nurses who work with infants under 6 months of age should have an understanding of the "Period of PURPLE Crying" Program?**

Yes

No

**Would you be willing to participate in a training program for the "Period of PURPLE Crying"?**

Yes

No

**Do you presently educate patients as parents or caregivers of infants on the "Period of PURPLE Crying" Program?**

Yes

No

**The National Center for Shaken Baby Syndrome with the "period of PURPLE Crying" program has a Dose Model of education do you know how many doses there are?**

One

Two

Three

Four

**I presently understand and have learned the Carry, Comfort, Walk, Talk actions:**

Yes

No

END OF SURVEY

## APPENDIX B

### ***What is the Period of PURPLE Crying Program***

The NCSBS was given a challenge by their International Scientific Advisory Board to empirically test a shaken baby syndrome (SBS) prevention program that is effective and can be used in any jurisdiction or setting.



From 2003 - 2007, parallel studies were conducted on the *Period of PURPLE Crying* program through randomized controlled trials (RCT) in Seattle, Washington and Vancouver, B.C., Canada. Delivery sites included pediatric practices, maternity departments, pre-natal classes, and nurse home visitor programs. Over 4,400 parents participated in the studies. Additionally, 25 parent focus groups were conducted to develop the new materials. The research has since been published in two prestigious, peer-reviewed journals: *Pediatrics* and the *Canadian Medical Association Journal*. The RCTs demonstrated that attractive, positive educational materials about crying and shaking are read and watched voluntarily outside of the presence of a health care professional in a high proportion of recipients, can significantly alter knowledge and change behavior that is considered key to preventing shaking.

In 2007, following encouraging results from the two randomized controlled trials, the *Period of PURPLE Crying* program was made available for generalized use, which includes a full color 10-page booklet and a 10-minute video (Available in DVD or App format), intended to be given to parents of new infants. The *PURPLE* program incorporates all of the important elements of a sound prevention program, including validated materials with positive, meaningful messages to parents. The *Period of PURPLE Crying* program approaches SBS and infant abuse prevention by helping parents and caregivers understand the frustrating features of crying in normal infants that can lead to shaking or abuse. The program provides the opportunity for parents to learn about the crying characteristics from over 25 years of research on normal infant crying conducted by Ronald G. Barr, MDCM, and other scientists worldwide.

The *Period of PURPLE Crying* is designed to be an improvement on current best practices by combining the *PURPLE* materials with the Mark Dias hospital-based distribution in maternity wards, but adding a second "dose" of reinforcement by public health and physician practices, and by including a public education and media campaign for the general public as the "third dose".

The *Period of PURPLE Crying* program was designed and approved by pediatricians, public health nurses, child development experts, and parents. The program is: parents. The program is:

- Educational and attractive to parents of newborns.
- Relevant for all parents while emphasizing the dangers of shaking a baby.
- Clear, memorable, and meaningful with a positive message.
- Designed to be interesting and relevant for both males and females.
- Presented at a grade 3 language level.
- Representative of multicultural and ethnic backgrounds.
- Acceptable to public health nurses; no bottles or blankets.
- Available in ten languages and includes closed captioning.
- Economical with large quantity orders available as low as \$2 per package, which includes both the full color 10-page booklet and 10-minute video (Available in DVD or App format).
- The *PURPLE* program model requires that each family receives the materials in the hospital or at the time of their child's birth so they can review the program when needed and share it with other caregivers.

The *PURPLE* program is comprehensive in that it comes complete with training and resources for nurses, educators, pediatricians, public health nurses and professionals in the community regularly meeting with parents of newborns and reinforcing important messages. The program also has a market-tested public

## RUNNING HEAD: Evaluation of Nurses' Knowledge of "Period of PURPLE Crying" Program

education campaign, at no additional cost, including, but not limited to, print advertisements, website media, bill boards, and radio and television ads. A parent website was launched to offer additional information on infant crying, sleeping and soothing. All of the articles have been written specifically for parents by world renowned, published child development experts. This website, [www.PURPLEcrying.info](http://www.PURPLEcrying.info) also provides parenting information specifically for dads.

The *PURPLE* program has been implemented in over 2000 hospitals and organizations in all 50 states, eight Canadian provinces and one Territory. The *Period of PURPLE Crying* program is serving 80% or more of the birthrates in Utah, Maine, Iowa, Kansas, West Virginia, Montana, Oregon and New Hampshire in the U.S. and British Columbia, southwest Ontario, Prince Edward Island and the Yukon Territory in Canada. Several jurisdiction-wide initiatives have set the goal and are working towards reaching 80% of their birthrate. These states are: Oklahoma, Washington, Arkansas, North Dakota, South Dakota, Wisconsin, Michigan, Indiana, Kentucky, Connecticut, New Jersey and Georgia in the U.S. and Nova Scotia in Canada.

## APPENDIX C

### Scales that Measure Crying Knowledge and Shaking Knowledge

• Mothers were asked "How much do you agree with each statement about an infant's behaviours and needs in the first few months of life?"

Answers were coded on a scale where 0 = Strongly agree; 1 = Agree; 2 = Disagree; 3 = Strongly disagree

(Don't know or Refuse to answer was re-coded as a score of 1.5 out of 3 on the scale)

#### • Crying Knowledge Scale.

- ( ) Infants cry more often in the late afternoon and evening.
- ( ) Infant crying increases in the first few weeks of life and reaches a peak in the first 2 or 3 months before getting less.
- ( ) If an infant is healthy, it should not cry unexpectedly or without a clear reason. (is reverse scored)
- ( ) When an infant cries it is always a sign that something is wrong. (reverse scored)
- ( ) Sometimes a crying infant can look like she/he is in pain even when they are not.
- ( ) Sometimes healthy infants can cry for 5 or more hours a day.
- ( ) A good parent should be able to soothe his or her crying infant. (reverse scored)
- ( ) It is ok to walk away from a crying infant when his or her crying becomes very frustrating.

#### • Shaking Knowledge Scale.

- (1) One important role for parents is to protect their infant by making sure people who take care of their infant know about the dangers of shaking an infant.
- (2) Shaking an infant can cause serious health problems or even death.
- (3) Shaking a baby is a good way to help a baby stop crying. (reverse scored)
- (4) Sometimes infant crying can be so frustrating or upsetting that I can see how someone might shake or hurt an infant.
- (5) Shaking a baby can be very dangerous and can cause serious injuries.

**APPENDIX D**

Alyssa York [ayork@dontshake.org]

Actions

To:

Brubaker-Vincent, Cynthia L

IRB

Tuesday, February 02, 2016 1:20 PM

You replied on 2/2/2016 2:52 PM.

Hello Cynthia,

I have given you permanent access to the training module for the purpose of evaluating and assisting the hospital. Thank you for making this a priority! Please let me know if you have any questions or concerns.

Best,

**Alyssa York | International Program Assistant**

*Period of **PURPLE** Crying Program*

CLICK for Babies Campaign Co-Manager

National Center on Shaken Baby Syndrome

1433 North 1075 West, Suite 110

Farmington, UT 84025

Office: [801-447-9360 ext 102](tel:801-447-9360)

Fax: [801-447-9364](tel:801-447-9364)

[dontshake.org](http://dontshake.org) | [PURPLEcrying.info](http://PURPLEcrying.info) | [CLICKforBabies.org](http://CLICKforBabies.org)

**NOW AVAILABLE!**

Order the *Period of PURPLE Crying* program Web & Mobile Application

**APPENDIX E**

January 28, 2016

Dear \_\_\_\_\_:

This is a letter of support for Cynthia Brubaker-Vincent, Principle Investigator for the project entitled "Shaken baby syndrome (SBS) and abusive head trauma (AHT)/ The "Period of *PURPLE* Crying" program." I understand that this student is conducting this project as part of their requirements for the DNP program at the University of Kentucky.

I understand that the Institutional Review Board (IRB) at the University, as well as St. Claire Regional Medical Center, is concerned with protecting the confidentiality, privacy, and well-being of research participants. Further, it is my understanding that the student will additionally be advised in this project by their academic advisor who will have regular contact with this student.

I do not have concerns about the study the student has proposed based on conversations with the student and after reviewing their research project proposal. This research will be carried out following sound ethical principles. Therefore, as a representative of St. Claire Regional Medical Center, I agree that Cynthia Brubaker-Vincent's research project may be conducted at our institution.

Should you have additional questions or concerns, you may contact me at (606) 783-6853.

Sincerely,

Lerae Wilson, DNP, RN, NEA-BC  
Vice President Patient Services/CNO



APPENDIX F



222 Medical Circle • Morehead, KY 40351  
(606) 783-6500 • fax: (606) 783-6518  
www.st-claire.org

**NOTICE OF IRB APPROVAL**

Date February 21, 2016

Name of Principle Investigator: Cynthia Brubaker-Vincent

Address: 800 Rose St.

City, State, Zip: Lexington, KY

Concerning the following study:  
St. Claire IRB Study #: 2016-02-09-1-1

Protocol Title: Nurses knowledge of the "Period of PURPLE Crying" program: Shaken Baby Syndrome (SBS) prevention.

Item(s) submitted for review (include version numbers and dates, if applicable): IRB Application for Expedited Review, Letter of Support, Study Questionnaire

For Federally-supported research, include the grant, contract, or cooperative agreement number (if applicable): n/a

**PLEASE READ THIS LETTER CAREFULLY IN ITS ENTIRETY.** It contains important information about your research proposal and your responsibilities as an investigator. The IRB is required by Federal Law to report all serious or continuing noncompliance with these requirements to Federal agencies.

**This study/items were:**

Approved by **expedited** review by Anthony Weaver, MD Date: 2/22 /2016  
This qualifies for expedited review based on Category(ies): 7

**-OR-**

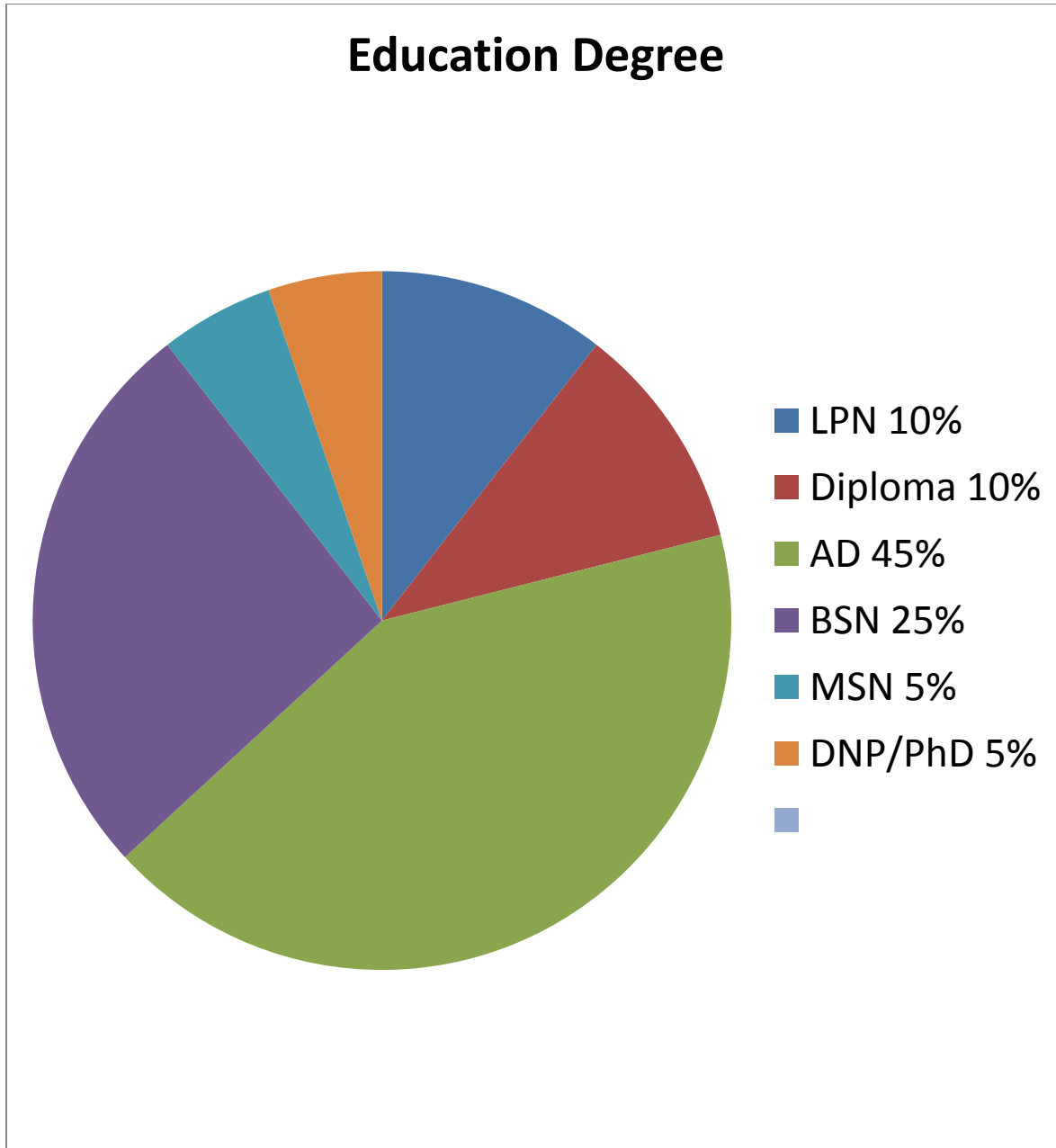
At the IRB meeting held on \_\_\_\_\_ members of the St. Claire IRB voted to approve the submitted items.

Your research plan has been granted  Initial or  Continuing approval. Approval extends for a period of one year. Subjects may be enrolled in your project from the date of approval through 2/22/17. At that point all research must have been ceased (including activities such as enrollment, data collection, data analysis, etc.) and a closure report submitted to the IRB. If you close this research activity earlier, please notify the IRB within 30 days of ceasing research activity. This approval includes and IS LIMITED to the items submitted for review as listed above.

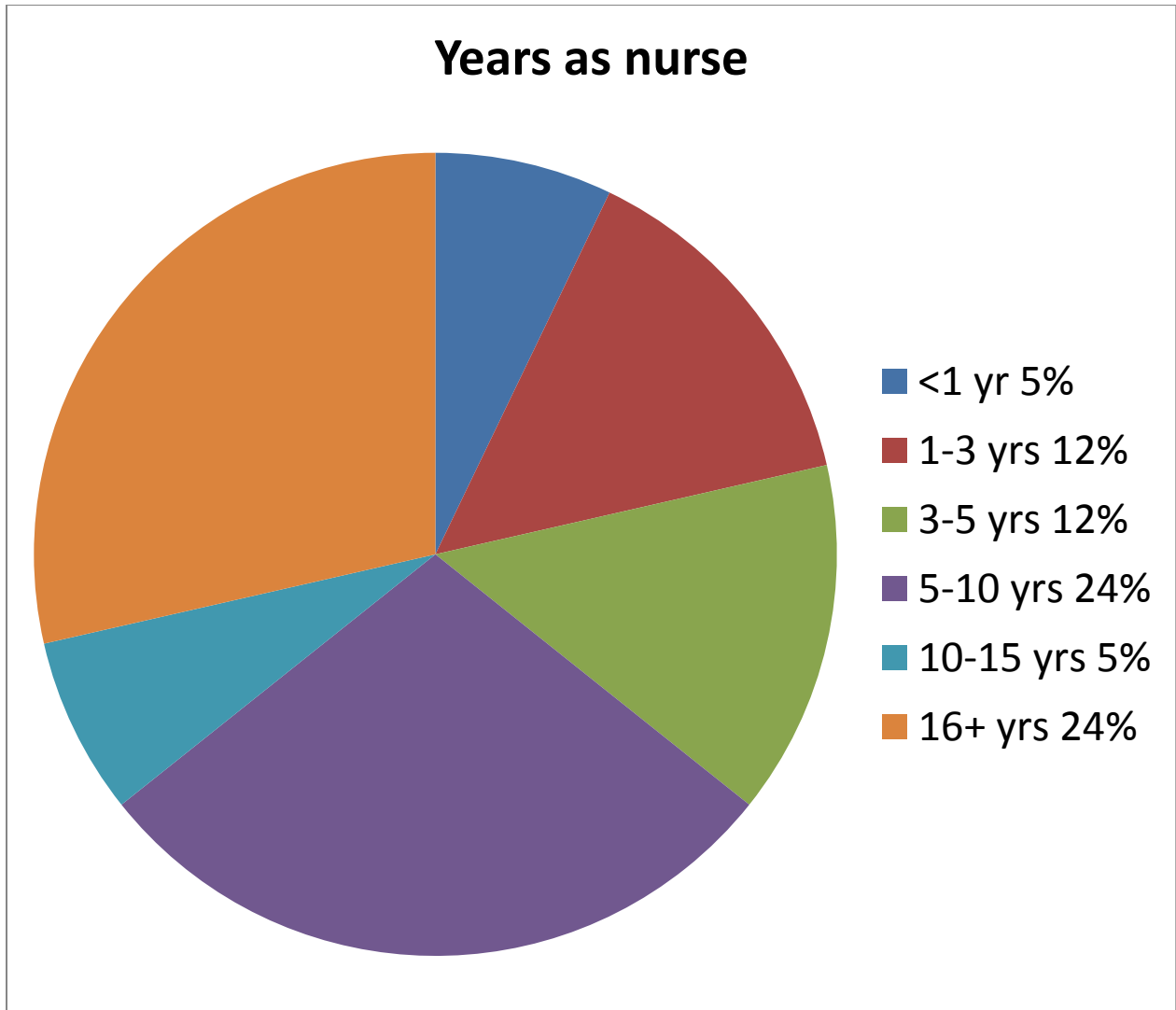
If you need additional time to complete your research, you can apply for a continuing review. To apply for a continuing review, you must have all elements required in a continuing review report into this IRB office no later than 1/22 /2017. As the Principle Investigator, it is your responsibility to assure that your continuing review request is submitted no later than that date, otherwise your research approval will expire. Although a

**APPENDIX G**

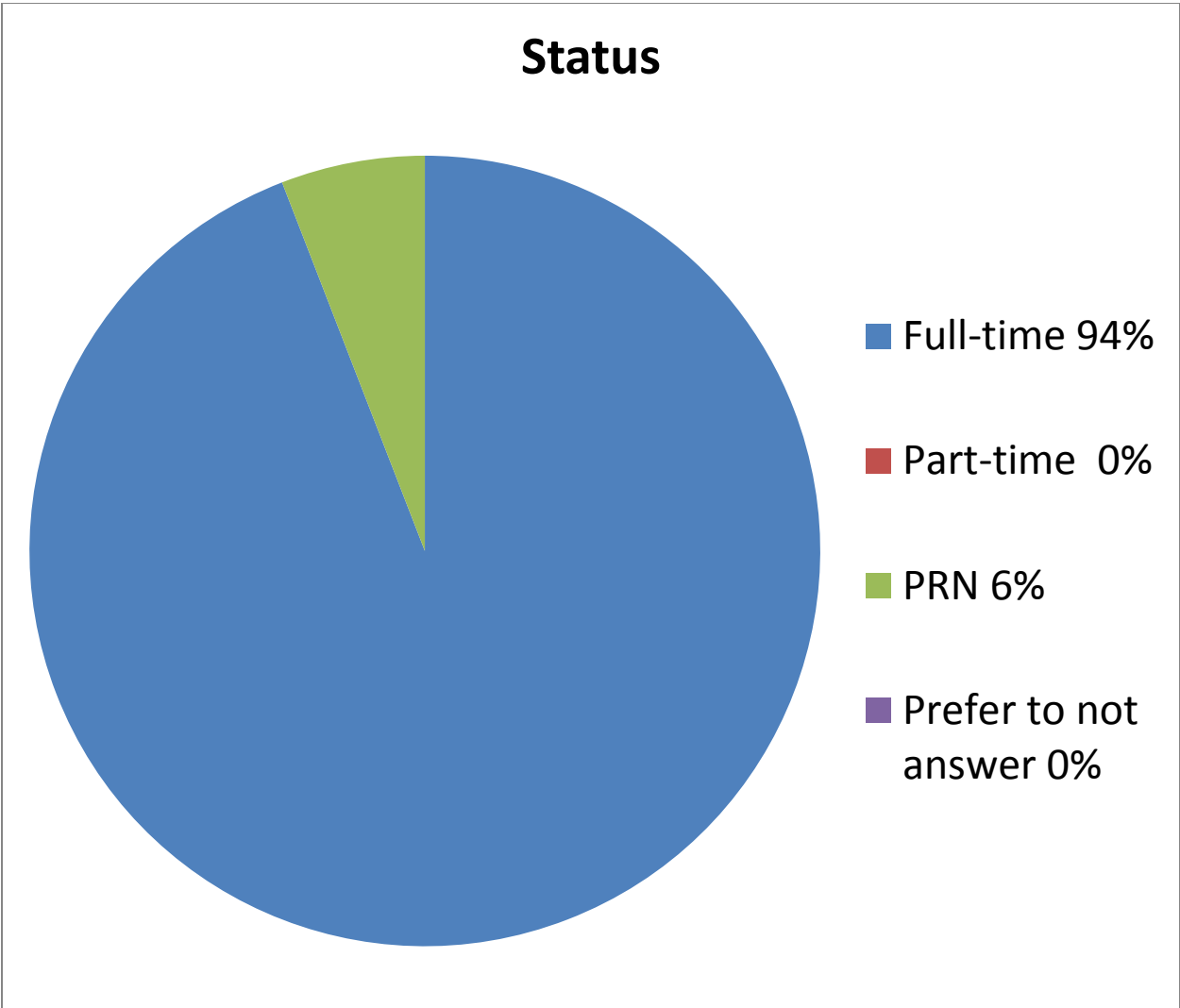
Nurses who are employed at St. Claire's Regional Medical Center =19



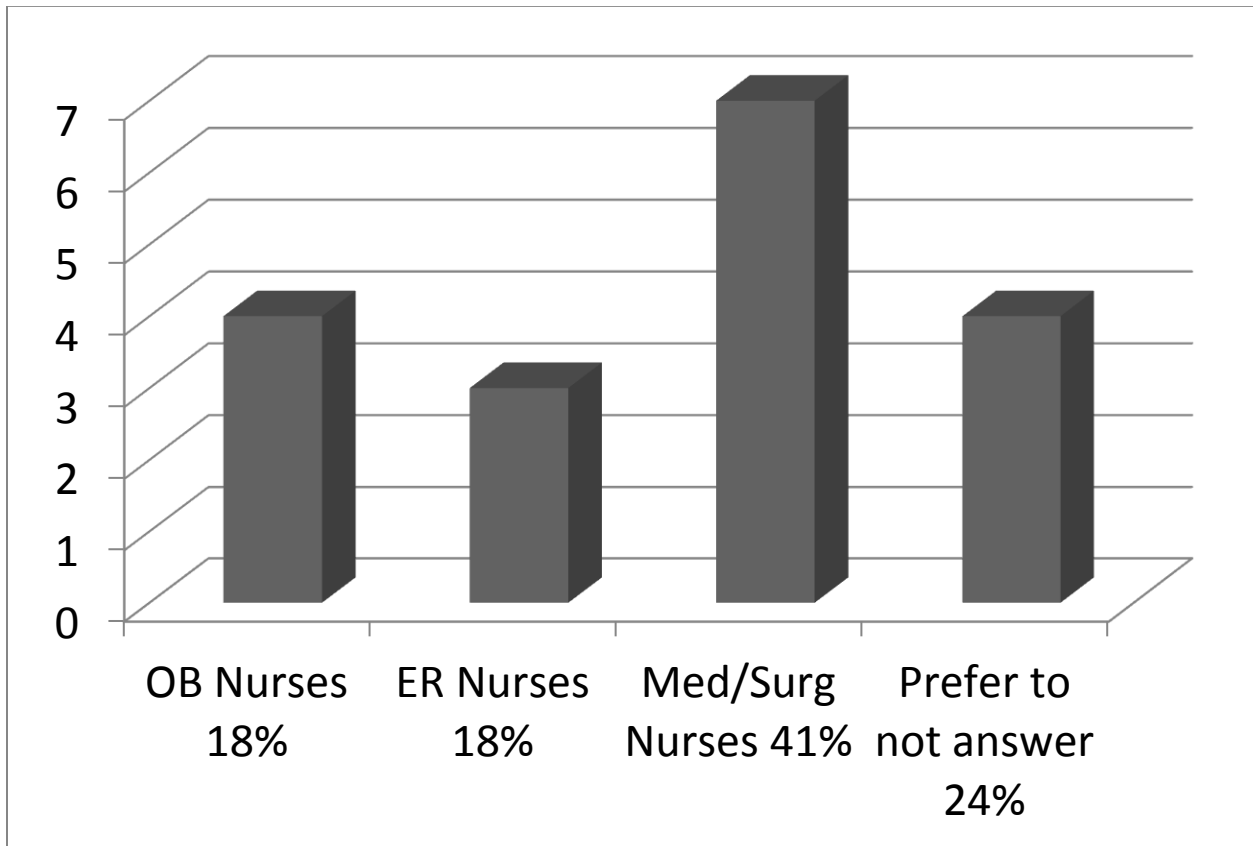
Staff nurses at St. Claire's Regional Medical Center; years as a nurse N=19



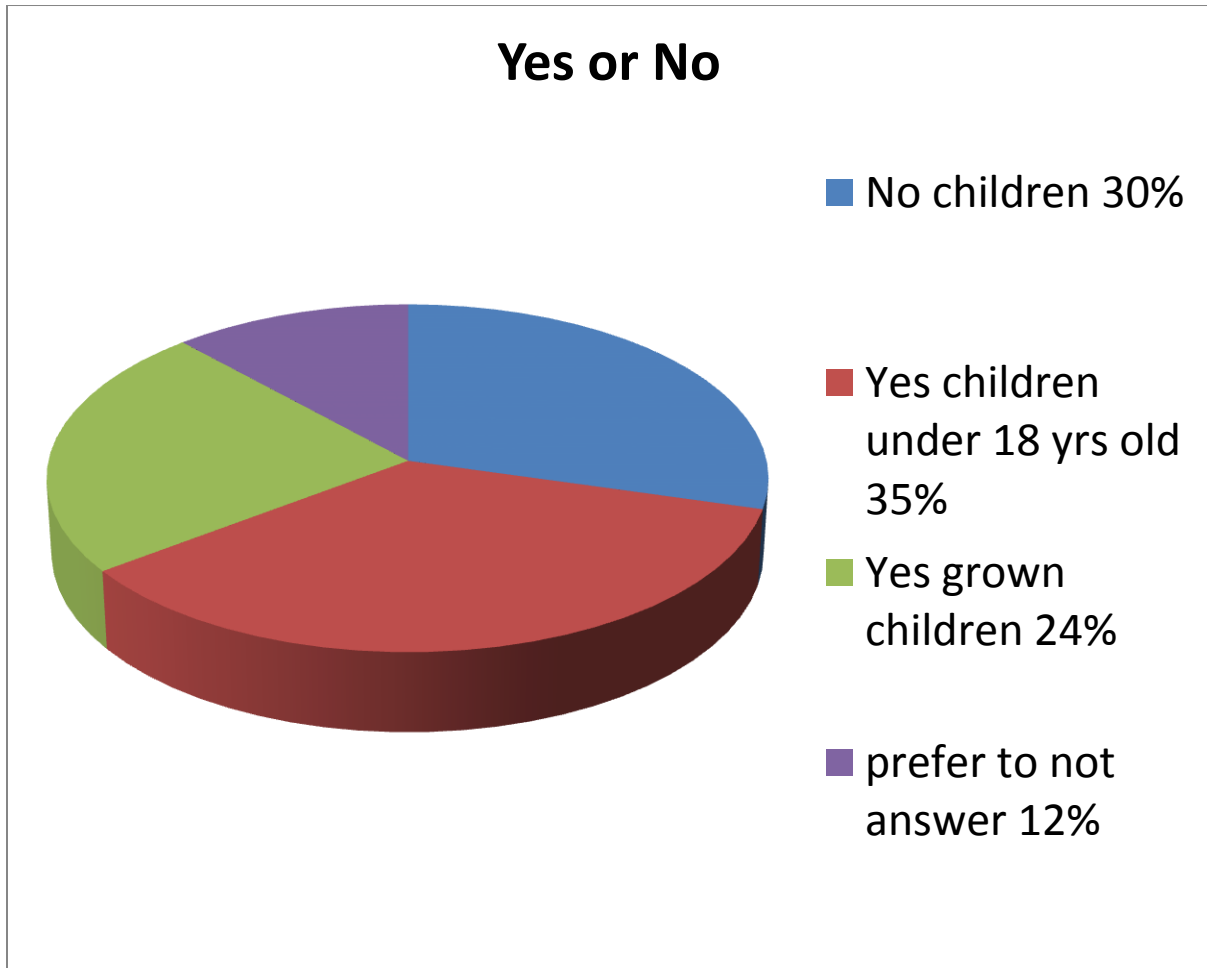
Work Status of nurses at St. Claire's Regional Medical Center – N=19



Nursing Department Survey Participants Work- N=19

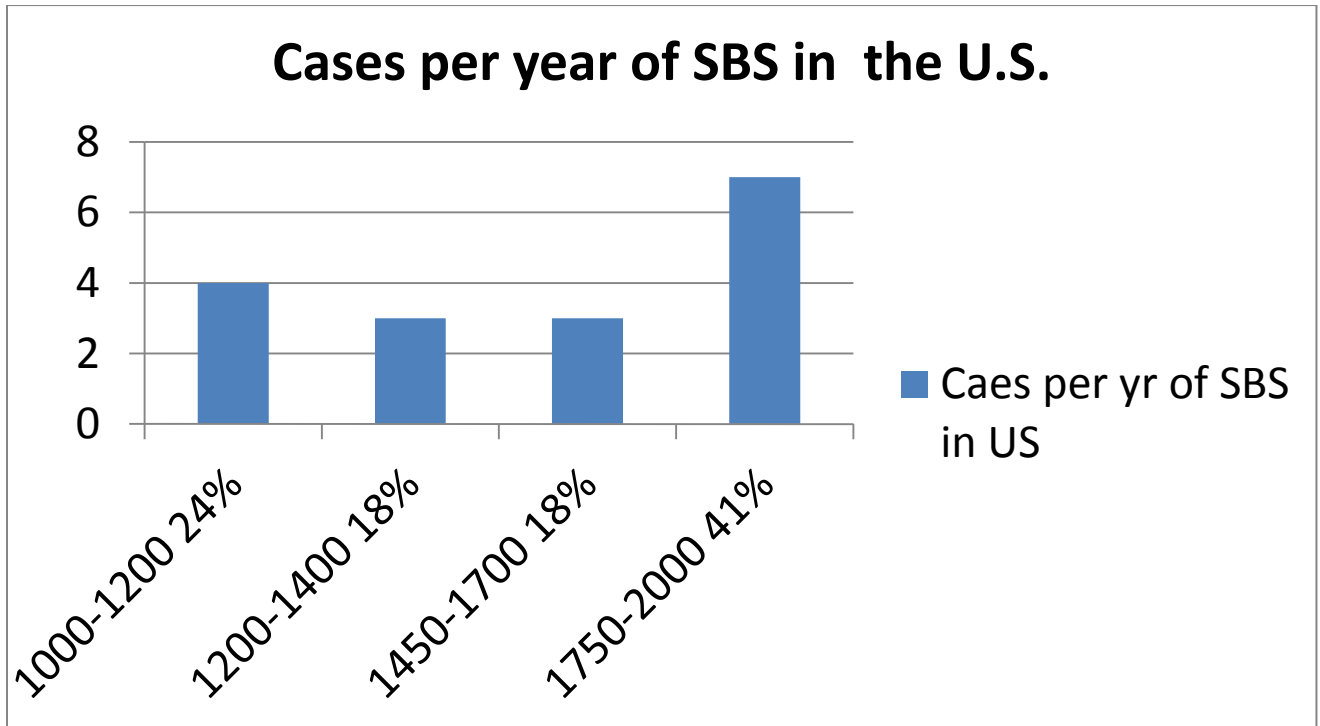


Employees that have children – N=19

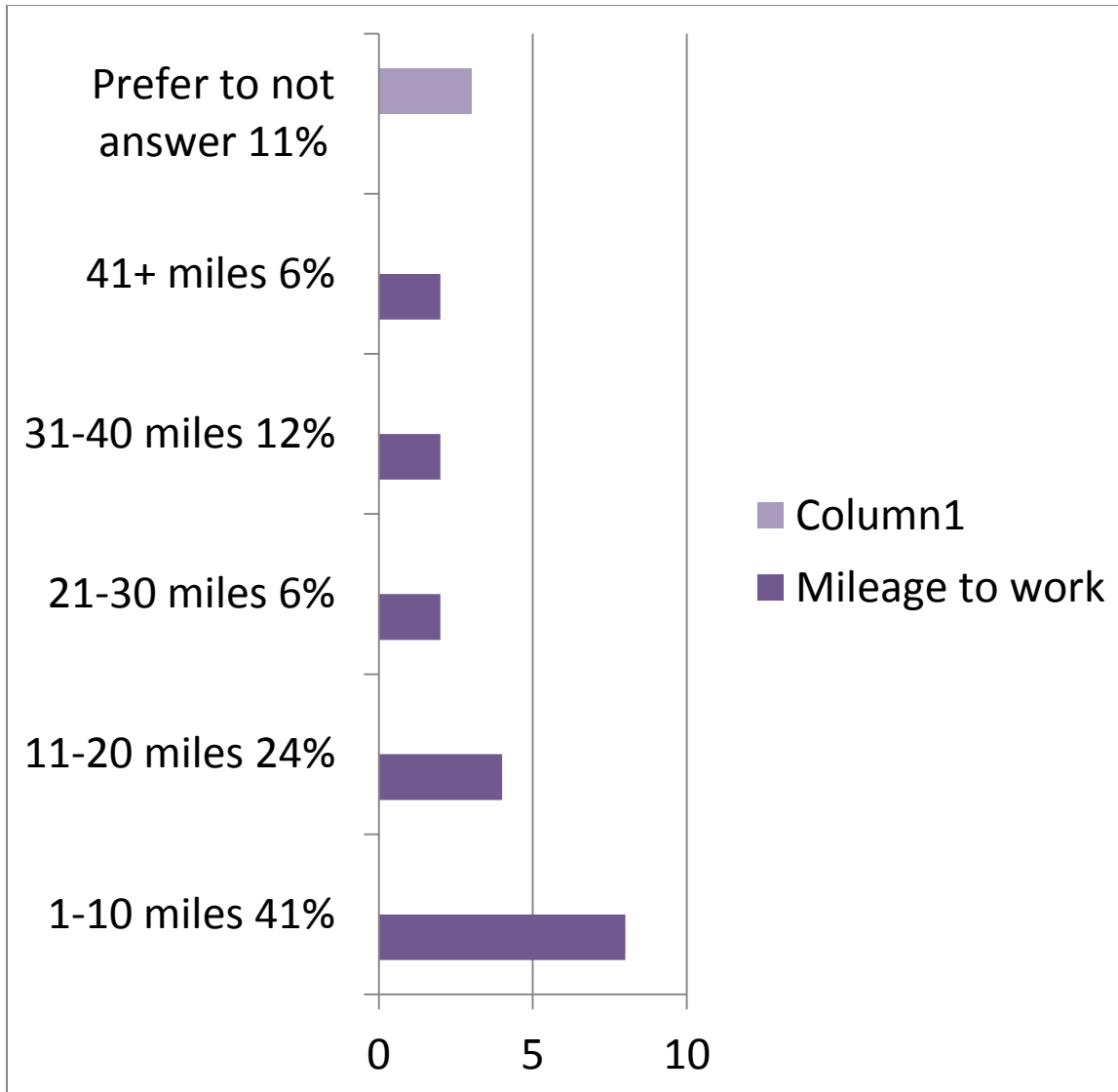


Nurse answer to the question about SBS cases per year – N=19

(Correct response is 1450-1700)



Nurses Travel Distance to Work at St. Claire's Regional Medical Center – N = 19





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