Postpartum Depression in the Neonatal Intensive Care Unit:

Experience of Mothers Utilizing a Webcam

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Abstract

Introduction: Mothers of infants admitted to the Neonatal Intensive Care Unit (NICU) are at increased risk for postpartum depression (PPD). There is limited research into the risk factors and NICU based interventions to prevent and treat depression. Webcams are becoming standard of care in the NICU. Research has shown that webcams increase attachment and decrease anxiety. No previous research examined the use of this technology for PPD prevention and it is an area that requires exploration.

Purpose: The project aims to identify whether the participants in a webcam study have PPD and describe the experience of mothers utilizing a webcam.

Method: This project occurred as a sub-project of an established webcam feasibility study. The research design was a descriptive qualitative survey with ethnographic analysis. A convenience sample of 12 NICU infant mothers were enrolled in a larger webcam study at a Central Virginia Academic Medical Center 51-bed Level IV NICU. Mothers completed demographic data upon enrollment and infant characteristics were gathered from the electronic medical record. A semi-structured interview included the Patient-Health Questionnaire-2 depression screen. Data collection through the semi-structured interview occurred 7-10 days after initiation of the webcam system.

Results: One mother screened positive for depression (8.7%). Three recurring themes emerged from the interviews: *baby in the NICU*, *cyber-parenting*, and *if the baby is ok, mother is ok.*

Nursing Implications: Education on the use of the technology would benefit mothers and future research is necessary to further explore webcam technology and PPD.

Keywords: postpartum depression, webcam, neonatal intensive care unit

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Postpartum Depression in the Neonatal Intensive Care Unit: Experience of Mothers Utilizing a Webcam

Postpartum depression (PPD) is a common mental health problem for women and the most common complication associated with childbirth (Werner, Miller, Osborne, Kuzava, & Monk, 2015). Rates of depression in the postpartum period range from 10-15% with higher rates for adolescent mothers from 28-48% and up to 38% for those with a low socioeconomic status (Mounts, 2009). For women with infants in the Neonatal Intensive Care Unit (NICU), the incidence of PPD can be as high as 63% (Miles, Holditch-Davis, Schwartz, & Scher, 2007).

To address the high prevalence of PPD, the US Preventive Services Task Force added postpartum women to their recommendation of people who should be universally screened for depression (Siu et al., 2016). The most common screening tools are the Beck Depression Inventory (BDI), Center for Epidemiological Studies Depression Scale (CES-D), Edinburgh Postnatal Depression (EPDS), and Postpartum Depression Screening Scale (PDSS; Tahirkheli, Cherry, Tackett, McCaffree, & Gillaspy, 2014). The task force guidelines did not include recommendations for timing of assessment or for preferred screening tool. Further, there have been mixed reviews about whether there is sufficient research to support these recommendations (Hewitt & Gilbody, 2009; Thombs, et al., 2014). As a result, universal adoption has not occurred.

Characteristics of PPD include depressed mood or anhedonia that typically occurs within the first four- to six weeks after childbirth (American Psychiatric Association [APA], 2013). Initial signs and symptoms may include changes in weight and appetite, low energy, changes in sleep patterns, feelings of guilt and worthlessness, poor concentration, and thoughts of suicide. Postpartum depression is different than Major Depressive Disorder in that disproportionate

worry and concern about the health of the infant, increased anxiety, and fewer suicidal thoughts are common (Alici-Evicimen & Sudak, 2003). This typically manifests as either over-involvement or under-involvement with their child.

Negative health consequences of PPD result for not only the mothers but also the lives of their children. These mothers may withdraw from their infants and have fewer positive interactions (Beck, 1995). Further, they are less likely to breastfeed and engage in safe behaviors such as using car seats appropriately (McLearn, Minkovitz, Strobino, Marks, & Hou, 2006). These qualities can lead to negative consequences for infants with already higher risks of medical complications. Infants of mothers with PPD are at risk for cognitive delays and behavioral problems that continue beyond infancy (Beardslee, Versage, & Gladstone, 1998).

The etiology of PPD is most likely multifactorial in origin (Beck, 2001; Rogers, Kidokoro, Wallendorf, & Inder, 2013; Tahirkheli et al., 2014). The most commonly identified risk factors for PPD are personal history of depression and low level of social support from partner and family (Mounts, 2009). Social factors associated with PPD include young age, low levels of social support, being unmarried, and having recently immigrated. Stress surrounding the pregnancy and birth such as difficult labor and admission to the NICU increase risk for PPD (Tahirkheli et al., 2014).

The NICU is of particular interest in PPD research because of the increased rate of PPD and the increasing rate of admission. Every year 280,000 infants are admitted to the NICU (Osterman, Martin, Mathews, & Hamilton, 2011) and admission rates have increased from 64 per 1000 live births in 2007 to 77.9 per 1000 in 2012 (Harrison & Goodman, 2015). Mothers in the NICU face several novel stressors that women with healthy infants do not encounter such as the cost of a NICU admission (Bicking & Moore, 2012) and severity of illness of the newborn

(Segre, McCabe, Chuffo-Siewert, & O'Hara, 2014). Environmental factors include alarms, physical barriers to holding their neonate, and unfamiliarity of the unit (Tahirkheli et al., 2014). Parents may be unable to spend desired amount of time with their child in the NICU due to physical distance from the hospital and competing familial responsibilities (Rhoads, Green, Mitchell, & Lynch, 2015a). Additionally, mothers struggle with defining the parental role within the NICU environment (Rogers et al., 2013).

The unique nature of the NICU experience warrants targeted treatment and multiple effective modalities exist for treating PPD for these NICU mothers. Interventions in the NICU have focused on communication, parent-infant bonding, education, and calming activities (Mendelson, Cluxton-Keller, Vullo, Tandon, & Noazin, 2017). Other interventions include psychotherapy and pharmacotherapy (Werner et al., 2015). Despite success of interventions, initiation of treatment for depression can only occur once depression has been identified and depression often goes untreated. Several factors limit treatment, including stigma, lack of resources, and knowledge of symptoms. Therefore, detection and early intervention is necessary.

Webcam technology may be a solution to address the unique challenges of barriers between parents and infants that can occur with NICU admission. An integrative review found several studies have examined the feasibility of web-based technologies capable of facilitating parent-infant interactions (Epstein et al., 2017). Rhoads and colleagues (2012) also reported the potential for webcam systems to provide assistance to mothers unable to visit in-person with their infant. In a follow-up study, parents reported that while parents prefer to be with their infant, the use of a webcam is a potential solution when this is not possible (Rhoads et al., 2015a).

The project aims to identify whether the participants in the webcam study have Postpartum Depression (PPD) and describe any patterns related to PPD in the context of webcam utilization. This project aims to answer the questions: 1) Is PPD a characteristic of mothers participating in this NICU webcam intervention? 2) What are the perceptions of postpartum mothers using a webcam system in the NICU?

Review of the Literature

Problem

The reportedly high rates of depression in the general postpartum population and that of NICU mothers warrant further review. Identification of the risk factors associated with PPD and exploration of the current state of interventions are needed to describe this population.

Literature Summary

The CINAHL, Ovid, Web of Science, and PubMed databases were searched to identify articles that evaluated depression in postpartum women. Separate searches were conducted to examine screening practices and interventions conducted in the NICU. Articles were limited to English language articles that were published between January 2000 and May 2017. This time frame was utilized after an insufficient number of articles were found from a more limited time frame.

On the topic of screening, the original search retrieved 639 articles from PubMed and 1539 from Web of Science. Search terms included “postpartum,” “postnatal,” “depression,” “NICU,” “neonatal intensive care unit,” and “screen.” An additional 184 randomized control trials were identified from CINAHL and ancestry searches based on relevant systematic reviews. After removing duplicates and those that did not meet criteria, articles were identified for more

in-depth review. Nine articles were reviewed regarding screening for PPD in mothers of NICU infants (Table 1). Articles were included if they used a measurement for PPD.

The original search for PPD interventions in the NICU garnered 3,628 articles from CINAHL, OVID, and PubMed. Search terms were: "postpartum," "postnatal," "depression," "NICU," and "neonatal intensive care unit." Results were limited to those interventions that occurred at least primarily during the NICU stay. After removing duplicates, dissertations, abstracts, and biological interventions, 13 articles were identified for extensive review (Table 2).

Screening for postpartum depression. Rates of positive PPD screens ranged from 15% (Bergstrom, Wallin, Thomson, & Flacking, 2012) to 63% (Miles et al., 2007). A cohort study compared rates of depression of mothers with an infant in the NICU and those with a healthy infant reported higher rates in mothers of an NICU infant (23% vs. 8%; De Magistris, Coni, Puddu, Zonza, & Fanos, 2010). Cherry and colleagues (2016) conducted a pilot study for universal screening at two-weeks. Of those who completed screening (N= 385), 137 (35.6%) screened positive for PPD and were given a referral to a mental healthcare provider. An additional 117 (30.4%) had results indicative of significant symptoms of PPD. Vasa and colleagues (2014) screened 131 women in the Special Care Nursery of an Illinois hospital with 19.1% of women screening positive.

The included studies reported biologic, psychological, and social factors associated with PPD rates. Biologic factors included a history or current substance use (Hawes, McGowan, O'Donnell, Tucker, & Vohr., 2016; Vasa et al., 2014). Psychological factors include a personal history of depression (Bergstrom et al., 2012; Lefkowitz, Baxt, & Evans, 2010; Vasa et al., 2014). Concurrent symptoms of anxiety and post-traumatic stress disorder have also been associated with PPD (Lefkowitz et al., 2010; Segre et al., 2014). Another risk factor is perceived

parental role alteration; parents may not know what role they serve while their infant is in the NICU (Miles et al., 2007; Rogers et al., 2013).

Several social factors were associated with an increased rate of PPD. Lack of social support can increase depression rates; one study reported a 60% increased likelihood of a depressive screening if mothers were not offered counseling while in the NICU (Bergstrom et al., 2012). Marital status is not a consistent predictor. One study found marriage associated with higher rates of PPD (Rogers et al., 2013), while two others found that single mothers had increased rates (Hawes et al., 2016; Miles et al., 2007). Several other social factors include decreased perception of family cohesion, and low perception of support from the staff (Hawes et al., 2016).

Infant factors include increased length on the ventilator (Rogers et al., 2013), complications during pregnancy and clinically correlated with low birth weight (<1500g; De Magistris et al., 2010). Lower perception of child health (Hawes et al., 2016) and increased worry about health had elevated depression scores (Miles et al., 2007). Of the biologic, psychological, social and infant risk factors, aspects related to support and perception of parental roles may be the most easily modified.

Study designs. Studies utilize various methods for examining PPD rates and qualities. Three different instruments were used in the included studies; the CES-D, the EPDS, and the PDSS. Those that used the PDSS did not include a description of the cutoff point (Cherry et al., 2016; Lefkowitz et al., 2010). One study utilized the CES-D with a cutoff of ≥16 to indicate PPD (Miles et al., 2007). Score cutoffs to indicate depression for the EPDS ranged from 10 (De Magistris et al., 2010; Hawes et al., 2016; Vasa et al; 2014) to 12 (Bergstrom et al.,

2012; Segre et al., 2014) to 13 (Rogers et al., 2013). No obvious trends of depression rates related to the cutoffs emerged.

The timing of the PPD screening varied as well without any conclusion regarding the accuracy of timing. Two studies had mothers complete PPD screeners at two-weeks (Cherry et al., 2016; Vasa et al., 2014). One study screened mothers at the time of discharge from the NICU (Rogers et al., 2013). The rest examined PPD rates at four-weeks to one month postpartum (Bergstrom et al., 2012; De Magistris et al., 2010; Hawes et al., 2016; Lefkowitz et al., 2010). Those studies that examined depression over a trajectory had different findings. Vasa and colleagues (2014) screened for PPD and reported that rates of positive screens declined after 31 days. Bergstrom (2012) reports similar rates at one month compared to four months (15% and 14%).

Staff attitudes. Cherry and colleagues (2016) conducted the only study that examined barriers to implementing universal screening for PPD at 14 days in the NICU. A project coordinator attempted to screen all women using the Postpartum Depression Screening Scale (PDSS). Of the 793 eligible women, 385 (48.5%) completed the scale. Of those who completed the scale, 137 (35.6%) screened positive for PPD and were given a referral to a mental healthcare provider. An additional 117 (30.4%) had results indicative of significant symptoms of PPD and may benefit from referrals. Barriers to implementation included challenges in making contact with the mothers, as well as administrative and referral barriers.

Attitudes regarding nurse provided screening were examined in a couple studies. Segre, Orengo-Aguayo, and Chuffo-Siewert (2016) examined the mothers' perspective and reported that the majority (90.2%) either strongly agreed or agreed with screening for depression by nurses in the NICU. In a statewide survey of nurses, the majority reported either strong agreement or

agreement with nurse-delivered screening for depression in postpartum women (Segre, O'Hara, Arndt, & Beck, 2010).

Interventions for postpartum depression.

Educational interventions. Several studies utilized an educational intervention to decrease PPD rates. The Creating Opportunities for Parent Empowerment (COPE) program utilized educational materials presented over the course of four weeks (Melnyk et al., 2006). Education was presented via audio recording and enhanced with reinforcement of education and activities to practice the learned skills. The material contained information on ways for parents to interact with their infant and improve their parental role while in the NICU and the transition to home. The comparison group received general hospital information and the standard of care discharge information at co-occurring time points. Mothers in the intervention group had significantly lower depressive symptoms at two-month follow-ups ($p = .02$).

Shaw et al. (2013) adapted the COPE program and provided this information along with six sessions of trauma-focused Cognitive Behavioral Therapy (CBT). The study compared mothers who received standard care (access to chaplains and social workers for support) with mothers who had received COPE and CBT intervention. At follow-up, mothers in the intervention group reported lower rates of depression compared to control group (Cohen's $d = 0.41$, $p < .001$).

The Cues and Care program compared two brief 6-session educational interventions that occurred primarily in the NICU (Zelkowitz et al., 2011). To address rates of stress in mothers in the NICU, the Cues interventions taught mothers skills to recognize signs of maternal anxiety and how to reduce them. It also taught mothers to recognize and respond to signs of distress that the infant displayed. The Care program provided general information about caring for an infant.

While no significant differences were seen between groups with regard to depression at follow-up (13% of Cues groups and 4% of Care group; p=.22) there was a large decrease in depressive symptoms in both groups. The sample supports other research that NICU mothers have high levels of depression with baseline rates of 39 (65%) mothers in the intervention group and 41 (67.2%) mothers in the Care group. The lack of difference may be due in part to the fact that both groups received educational material.

Another study compared the addition of educational materials to group psychological support in a randomly controlled trial in a Brazilian sample (Carvalho, Linhares, Padovani, & Martinez, 2009). No difference was found among groups with regard to depression scores, but each group demonstrated significant reductions in BDI scores at follow-up. The use of a psychological support group for both groups may have confounded the data.

Two studies examined the effects of increasing physical contact between the mothers and their NICU infants. One study compared two interventions for increasing physical contact between mother and infant (Holditch-Davis, White-Traut, Levy, O'Shea, Geraldo, & Davis, 2014). The first, an auditory, tactile, visual, vestibular intervention (ATVV), involves stroking and massaging the infant. The second, kangaroo care (KC), has the mother hold the infant to increase skin-to-skin contact. No difference in depressive scores among groups was found at the one-year follow-up (F=0.74). The study was limited by a high dropout rate and reports that mothers used techniques from the other interventions. Another study focused on improving attachment through touch was the Family Nurture Intervention (FNI; Welch et al., 2016). This intervention taught mothers various methods of calming their infant, based on the level of interaction allowed in the NICU. Mothers in the intervention groups had increased contact with their infants and 4-month follow-up there was a significantly lower rate of depressive symptoms

compared to standard of care (2.5% vs. 17.5%; Fisher's exact test $p = 0.028$). These educational interventions focused on increasing attachment demonstrated decreased depression rates.

Psychological interventions. Several studies examined the use of psychological interventions in the NICU to reduce or prevent PPD. Bernard and colleagues (2011) conducted a pilot study comparing three individual sessions of CBT versus standard of care. These sessions consisted of education about the NICU environment and expectations, cognitive restructuring, and relaxation techniques. Follow-up occurred after one month after discharge and demonstrated a trend toward lower depression rates in the CBT group ($p = .06$). Another CBT program targeted low-income mothers of preterm infants (Silverstein et al., 2011). These CBT sessions focused on problem-solving and identifying aspects of care under the parents' control. No significant differences were found between groups for depressive symptoms.

A less structured approach to a psychological and social intervention is through Listening Visits (LVs). These LVs were implemented in six individual sessions for 45-60 minutes and focused on empathic listening about the mothers' experiences and concerns with problem-focused discussions (Segre, Chuffo-Siewert, Brock, & O'Hara, 2013). A feasibility study with a Neonatal Nurse Practitioner as facilitator resulted in significant decreases in EPDS scores and a majority (52.2%) of participants "recovered" at follow-up (p. 926). This study focused on creating a support system for the psychological and social support needs of the mother.

Additional research. Bright light therapy for mothers in the NICU was studied for the first time (Lee, Aycock, and Moloney, 2012). The researchers posited that mothers visiting their infant in the NICU did not receive the proper amount of sunlight and that this affected their circadian rhythm. The intervention exposed mothers to a bright light once a day for three weeks while the placebo arm used a red light visor. The red light visor has no

therapeutic benefit. While no significant difference was noted between the use of bright light therapy compared to the placebo light therapy, a trend toward reduction of depressive symptoms was noted at three weeks (d = .40) and increased overall mental health (Cohen's d = .60).

A meta-analysis of interventions in the NICU identified 12 studies that examined anxiety and depression (Mendelson et al., 2017). One of the limitations of included research was the high rate of refusal to participate, which the authors note could confound the results by not being representative of all NICU mothers. Overall, cognitive-behavioral interventions and those that lasted longer had the greatest impact on reducing depressive symptoms, while educational interventions did not.

Gaps in the literature. To date, there have been no randomized controlled trials regarding the implementation of screening for PPD in the NICU. Several studies examined the risk factors associated with PPD in the NICU but only one study examined a universal screening and associated barriers to implementation (Cherry et al., 2016). While Family-Centered Care has been in use to reduce stress in parents with an infant in the NICU, no study has examined the effect on depression rates or qualitative experience (Van Riper et al., 2001). The studies identified a wide variety of associated factors. The inconsistency and diversity may indicate that less quantifiable factors may relate to PPD. Overall, interventions have utilized self-report quantitative measures and few qualitative studies exist to examine maternal experience related to PPD (De Magistris et al., 2010).

While there have been several studies examining the benefit of maternal physical contact with infants in the NICU, no study has examined interventions to improve attachment when the mother cannot be physically present in the context of PPD (Holditch-Davis et al., 2014; Melnyk et al., 2006; Welch et al., 2016). The focus of interventions to reduce depressive symptoms has

been on those occurring while the mother is physically in the NICU. Few have addressed the experience of those mothers who cannot be in the NICU with the infant and none of these addressed PPD. One study utilizing a webcam system reported decreased anxiety and increased mother-infant attachment (Rhoads et al., 2015a).

Implications for Nursing

1) Postpartum women are at risk for depression.
2) Postpartum women have lower depressive scores at follow-up if screening is paired with appropriate depression treatment.
3) Educational interventions that increase parental knowledge of infants decrease PPD scores.

Theoretical Framework

The Patient- and Family Centered Care framework aims to improve family attachment to the infant (Epstein et al., 2017). This framework is defined as "a way of caring for children as well as their families within health services which ensures that care is planned around the whole family, not just the individual patient and in which all the family members are recognized as care recipients" (Shields, Pratt, & Hunter, 2006, p. 1318). A term that was first established in the 1960s, the frameworks has received endorsement from the American Academy of Pediatrics (Committee on Hospital Care and Institute for Patient- and Family Centered, C.A.R.E., 2012). This framework has been increasingly integrated into NICUs with the aim of improving overall family satisfaction and outcomes (Gooding et al., 2011).

Project Rationale

This project aims to fill some of the gaps of research and to supplement the current literature. Research suggests high rates of PPD in mothers of infants in the NICU. Use of

webcam technology that provides live video of infants is becoming standard of treatment and may be able to improve parental involvement for mothers unable to be at the bedside. Little is known about the influence of this technology on the mothers' perceptions of care and how it relates to possible depressive symptoms. Therefore, there is a need to examine this aspect of implementation.

Research questions

1) Is post-partum depression a characteristic of mothers participating in this webcam, NICU project?

2) What are the perceptions of postpartum mothers using a webcam system in the NICU?

Methods

These mothers encounter multiple stressors when their infant is in the NICU and are at an increased risk for PPD (Mounts, 2009). Webcam technology has been developed to improve communication and facilitate attachment of the mothers (Epstein et al., 2017; Rhoads et al., 2012; 2015a). However, few studies have examined the experience of using webcam technology in the NICU and no study has examined how it relates to PPD.

Purpose

The larger study aims to describe parents' experiences with a commercially available webcam system in the NICU (see Appendix A). Further, it is testing the feasibility of the webcam system within the NICU.

This sub-project's aim was twofold. First, to identify whether the participants in the webcam study had PPD. Secondly, to describe any patterns related to PPD in the context of webcam utilization.

Definition of Terms

Neonatal Intensive Care Unit (NICU). The NICU is a specialized hospital unit, which provides care for newborns from the time they are born until they are stable enough to be discharged home or to a lower level of care. The level of the NICU (I-IV) denotes the services provided. Level IV indicates a Regional NICU with surgical capabilities and the ability to care for the most ill of newborns (American Academy of Pediatrics Committee on Fetus and Newborn, 2012).

Postpartum depression. According to the DSM-5, a diagnosis of PPD requires five or more symptoms over a two-week period and occurring within four weeks of giving birth (APA, 2013). One of the symptoms must be either depressed mood or anhedonia. The other symptoms can be:

1. Significant weight change (APA, 2013)
2. Marked change in sleep pattern (APA, 2013)
3. Increased or decreased psychomotor activity (noticeable to others)
4. "Fatigue or loss of energy nearly every day" (APA, 2013, p. 161)
5. "Feelings of worthlessness or excessive or inappropriate guilt" (APA, 2013, p. 161)
6. Decreased concentration (APA, 2013)
7. Recurrent thoughts of death or suicidal ideation (APA, 2013)

Angel Eye®. This is a webcam technology designed to provide families' access to live streaming video and images of their infant in the NICU (Angel Eye Camera Systems, LLC, 2017). It has the technological capabilities that include: live streaming, instant messaging, information uploads, and virtual rounding.

Study Design

This was a qualitative study. Data was collected from mothers enrolled in the larger webcam study. Interviews were analyzed using the ethnographic method to develop a domain and taxonomic analysis.

Sample

Participants consisted of 12 mothers of 13 infants in the NICU using the webcams. Included participants were part of a larger feasibility study on the use of the webcam technology in the NICU. For inclusion in the project, mothers were at least 18 years of age and spoke English. Fathers and mothers under the age of 18 were excluded for this project.

Setting

The study took place in a 51-bed Level IV NICU at a Central Virginia academic medical center. The NICU has two categories of care: intensive care and intermediate care. Both were included in the study. The unit has an open floor plan without room for parents to stay overnight on the unit.

Procedures

Study team members and NICU staff identified and invited eligible mothers to participate in the webcam study. Interested mothers signed informed consent after receiving verbal and written information about the study and participation requirements. Mothers completed a baseline demographic survey after providing consent for participation. Mothers received education regarding the use of the webcam system and resources for 24-hour assistance. After having access to the webcam system for 7-10 days, mothers participated in a semi-structured interview (Figure 1). Interviews were audio recorded and saved with a de-identified number following verbal consent for recording. The interview took place either on the unit, in a nearby conference room, or by telephone according to participant preference. Participants received a

$20 gift card for completion of the interview. Recorded interviews were transcribed prior to analysis.

Measures

Demographic data. This information was collected for the larger webcam study and was utilized in data analysis for the sub-project. Upon signing informed consent, participants completed a parental demographic form. Parental information included race/ethnicity, employment status, level of education, number of other children, and NICU history (Figure 2). Demographic information was retrieved from the medical record about the infant such as gestation age, day of life and intubation status (Figure 3).

Semi-structured interview. Participants completed a semi-structured interview at 7-10 days following enrollment in the study. The interview timing was based on the study design of the larger study for convenience of participants. Pertinent questions were added to the original semi-structured interview and the whole list of questions can be found in Figure 1. Identification of participants with potential PPD occurred through the use of two questions adapted from the Patient Health Questionnaire-2 (PHQ-2) and included in the interview (Kroenke, Spitzer, & Williams, 2003). Interviews were recorded and transcribed by the primary author.

Reliability. All notes and transcripts of interviews will be maintained for other researchers to examine. At time of analysis, a second reader examined the material for consensus. The qualitative data was collected until saturation of themes had been obtained. A score of $\geq$2 on the PHQ-2 has a sensitivity of 86% and specificity of 78% for depression diagnosis (Arroll et al., 2010).

Data Analysis

Demographic data were analyzed using descriptive statistics with SPSS v25 (IBM Corp, 2017). These data were further analyzed based on the scores of the PHQ-2 as related to screening for PPD.

Qualitative data were analyzed according to an ethnographic approach (Spradley, 1979/2016). Themes of the data were elicited through first, conducting a domain analysis, by coding each line for relevant terms. Cover terms were determined based on the themes of the content to represent the variety of descriptions that people use. Semantic relationships were written to link the included terms to the cover terms of the domains. There are multiple types of sematic relationships (e.g. strict inclusion, cause-effect, function, and sequence). For instance, an attribution semantic relationship would be written as X is a characteristic of Y.

The data was next organized into taxonomies, further describing the domains and the terms and relationships within the domains. Structural questions were asked of the data to ensure completion of cover terms, semantic relationships, and included terms. Taxonomies identified the sub-relationships among the terms and how they relate to the whole domain. Areas of focus were on the use of the webcams, attachment with the infant, support system, and mood throughout the NICU stay.

Protection of Human Subjects

The Institutional Review Board for Health Sciences Research (IRB-HSR) at the University of Virginia approved this study (Figures 1 and 2). As this is a sub-project of an existing IRB approved study, a modification request form was submitted and approved. The unit ethics committee for the NICU approved the additional questions as well. Informed consent was obtained prior enrollment in the study (Appendix B). Participant information was de-identified with a study identification number following receipt of signed consent. Identifying information

will be kept separately from the questionnaire in a locked cabinet and will be destroyed as soon as it is no longer being used or participants withdraw from the study. Participants were able to withdraw from the study at any point. Gift cards were provided for compensation at completion of interviews.

Two social workers in the NICU provide counseling and referrals for additional psychological services as needed. Per unit protocol, each social worker is assigned to a specific mother. One mother screened positive for depression during the interview and a referral was made to the social worker for further evaluation (Appendix C).

Results

Twelve mothers completed interviews between September 1, 2017 and February 28, 2018. Mothers were primarily Caucasian and unemployed (Table 2). Average distance from the hospital was 39 miles (SD = 31.2). One mother had a set of twins. Two mothers reported a history of Major Depressive Disorder. Of these two women, one was taking an antidepressant medication at the time of the interview. Neither of these women screened positive for Depression on the PHQ-2, but one participant scored a positive score of 4 (8.3%).

There were 13 infants included as one mother had twins. Infants were primarily female (n = 7; Table 3). Most were admitted for prematurity (n = 11) with a mean gestational age of 31.4 weeks (SD = 3.4; Range = 23.8-37.1). Mean day of life at enrollment was 19.23 (SD = 19.9). Mean birth weight was 1703.4g (SD= 813.7) compared to mean weight at time of study (2010.77g; SD = 734.98). One infant was intubated at time of interview and had received surgery prior to the start of the project.

Mothers discussed their experiences in the NICU and how that related to the use of the webcam. In analyzing the data, three recurring themes emerged of the experience of these mothers: *Baby in the NICU*, *Cyber-parenting*, and *Mother is ok if baby is ok* (see Figure 5).

Baby in the NICU

The NICU is an inherently disquieting environment that does not lend itself to normal parent-child interactions**.** So, it was not surprising that all of the participants reported experiencing stress while they were in the NICU. Mothers defined stress in terms of various negative emotions. While none of the mothers used the term "depressed," they used the terms such as: "emotional," "nervous," "overwhelmed," "down," and "sad."

Mothers predominately reported stressors as they pertained to the baby. There were three general categories of concerns while the baby was in the NICU. The first was concern for the infant's health and the second not having the infant at home. The remaining stressor related to difficult communications between the mother and staff.

Health concerns. Infants in the NICU have health issues that most newborns do not have such as decreased lung capacity, infections, diaphragmatic hernias, and reliance on tube feeding. These issues are beyond the realm of what mothers of typical infants' experience. Along with critical health conditions come novel equipment and treatments. One mother said, "he has to be hooked up to everything, which I know it helps him, but it's not really easy to see your child go through that." Another mother stated that she felt "nervous" about "different machines being hooked up to her baby." The mothers learned the language of the NICU, with common words being: "CPAP," "tubes," "surgery," and "support." The babies seemed so small to the mothers and being surrounded by a variety of highly technical equipment made them seem even smaller.

Infant not at home. There were several aspects about not having the infant at home that the mothers found stressful. Even though several mothers were able to visit the NICU, they missed having the baby at home. One mother said that she was a "little sad, of course, that he's not home with us" while another stated, "it's stressful to have him there and not have him home." One participant compared the NICU experience to her previous births and reported, "it's just more emotional…I've never been emotional after having a baby…it's partly emotional it's not really a big deal it's just emotional right now until the baby gets here." Even when mothers were able to visit the baby in the NICU, those with other children worried because it took them away from home. One mother, who had twins stated that when she was in the NICU, she felt "like I'm neglecting my kids at home or when I'm at home I'm neglecting my babies here."

Communication. While most mothers related positive experiences with the NICU staff, several found that certain interactions increased their worry, and they felt left out of the care team. One mother was frustrated to learn that the treatment plan changed between phone calls to the NICU and was frustrated that information "changed a lot," between providers. She wanted to be present in the NICU to ensure that she received all information and could understand it completely. Mothers thought that not all information was included when they asked for updates on phone calls. One mother felt "they were kind of getting an attitude with me and I would calm myself down, but it would always make me feel like they were talking to me like I was stupid."

Cyber-parenting

Instead of bringing home an infant from the NICU, these mothers brought home a webcam. While some spent more time than others in the NICU in person, all mothers used the webcam. They used it to perform some tasks of the mother role, interact with the infant, and share the new baby experience with others.

Webcam technology. While the webcam technology offered a way to mitigate the baby's absence, it did create its own set of issues. The technology could not fully replicate face-to-face interaction. One mother felt that she could not fully engage with her baby because he could not hear anything. Another reported that she still came up to the NICU every day because "that camera is just a camera. I mean you can't touch her over a camera, you can't hold her." Some mothers also felt the distance provided a barrier to gaining accurate information. One mother said that she needed to be physically present to "understand" all of the care decisions. When the camera was not working, mothers wondered if it was a planned shut off or a problem with the infant's health. Concern was also expressed by those family members who could not visit and were affected by technical problems. In addition to connection problems, there were staffing errors when the "camera wasn't always pointed at the baby" or staff could not log into the system because of forgotten passwords.

Role of mother. In spite of limitations associated with the webcam, the mothers engaged in some activities that women with normal newborns at home do. They pumped breastmilk, checked on the baby's health status, and learned about newborn care live, as the nurses were doing it. They pumped breast milk while watching their infant in place of breastfeeding. Four mothers reported that they pumped breastmilk while watching the webcam. One of these mothers reported that it "helped my milk supply a little bit" and another felt "more connected." Several mothers used the webcam to learn more information about their infants. They enjoyed that they could get a visual without calling the NICU. One mother watched to determine the progress of "feeds" from tube to "bottle." Mothers watched the "cares" that the nurses performed on the infant. This was especially helpful when one of the mothers returned to work

as she had performed these "cares" when she visited the NICU and wanted to learn more techniques.

Interaction with infant. Though some might not think the parent was interacting with the baby, when using the webcam, participants described it as that. Watching on a webcam allowed these women to feel "more connected" and to "stay focused." They also enjoyed that they could use it whenever they chose, and it felt like they were "having more time" with the infant. Beyond watching, some mothers would "talk" to their infant even though they knew that the infants could not hear them. To address this, one mother would "send messages" through the messaging service for the nurses to read aloud to the infant.

Shared experiences. Watching a webcam when others could watch one too, allowed the mothers to have a shared experience. Mothers were no longer in a position of simply reporting how the baby was doing. Others could see what was happening in the NICU, and what would have been a one-way report dialogue, became a shared conversation. Several mothers reported that they watched the webcam with their husbands. One woman's husband was deployed during pregnancy and the NICU stay. She stated that the webcam "gives him a visual to things like when I'm explaining" equipment and the care routines and allowed him to be a "partner" from a distance. Even though mothers could not bring the baby home, they could "show" and "introduce" the baby to various people. This included parents, friends, co-workers and the infant's siblings. Mothers enjoyed sharing their infant with others and one even called this activity "fun."

Mothers is Ok if the Infant is Ok

In spite of being in the NICU, the mothers who participated in this project generally felt that if the baby was ok, she could be ok too. As one mother put it "as long as she's doing great

and working through the steps then I'm good." They learned that the infants were ok, often through watching the webcam. They felt reassured that they could watch the infants on the camera rather than "wonder what he's doing or how he's doing." Mothers used several terms to describe what being ok felt like for them. When the baby was ok, mothers described themselves as "feeling comforted," "being positive," "less stressed," and "reassured and encouraged."

To describe their perceptions of the babies' well-being, the mothers described certain behaviors, states or medical progress. Mothers indicated that behaviors such "kicking around" could be signs of thriving. The mothers appreciated seeing the baby "sleeping" or "bundled up," in states that indicated the baby was peaceful. When the mothers saw medical progress, they also interpreted this as the baby being ok. One mother described that when the nurses "got everything off of him and he was breathing on his own," she felt "better" than when the infant required the additional support. Two mothers reported that they called the NICU less frequently when they could see their child on the screen and knew things were ok.

Discussion

The majority of these mothers did not screen positive for PPD, with rates lower than the general population and previous research in the NICU (Mounts, 2009; Miles et al., 2007). The qualitative interviews suggested that they were in overall positive moods. Due to the study design, no correlation can be made between webcam and mood. However, overall the mothers described improved mood when they could view their infants from outside of the hospital. It appears the most important factor was the health of the infant. This is consistent with previous literature that examined anxiety in the NICU (Rhoads et al., 2015a). Other aspects that appeared to help the mothers stay euthymic included engaging in typical roles of the mother, connection with the infant, and connection with the support system.

This exploratory qualitative study aimed to describe the experiences of mothers utilizing webcams in the NICU. The analysis provided information about the stress associated with the having an infant in the NICU. Mothers in this study would prefer to be in the NICU but appreciated the option of the webcam. This aligns with one of the key themes found in the work of Rhoads et al. (2015a). The webcam allowed these mothers to connect with their infants and support systems. Mothers described their experience with the webcam as increasing their knowledge of the health of their infant. This information ranged from assurance that the infant was resting to feeding status. As some mothers reported decreased frequency of phone calls to the NICU staff, it may indicate a feeling of inclusion.

Previous research identified lack of social support as a risk factor of PPD. Mothers in this project discussed the importance of their support systems. The webcam provided an opportunity for family involvement. Rhoads et al. (2015b), found that while fathers had a lower frequency of use, there was no significant difference in duration of use compared to mothers. Several mothers reported that they found the webcam helpful for their spouse and family members that could not visit in person. They also described watching the webcam with their spouse and family members and this joint viewing may not have been measured in previous research. Of particular interest is for spouses in the military as one mother discussed the importance of watching with her deployed husband. According to Levine et al. (2015), women who give birth while their partner is deployed are more likely to have postpartum depression (odds ratio [OR] = 1.10; 95 % confidence interval [CI] = 1.04–1.15). The use of the webcam to include the mother and other family members is consistent with the Patient- Family Centered Care framework.

Strengths and Weaknesses of Design

The qualitative design of the project enabled investigation of previously unexamined experiences: mood in the context of webcam use in the NICU. These experiences are difficult to quantify, and the qualitative design enabled exploration of the experience. Conducting a semi-structured interview allowed participants to expand and personalize their responses. This elicited information and trends that otherwise may not have emerged with a structured questionnaire. This is an unexamined area of research and thus the information informs the gaps of literature.

A potential weakness is the sample size. The sample size for this project was small due to time and equipment constraints. A small sample size limits external validity and possibly the variety of responses. However, this project provides information about the use of webcam technology for this particular NICU. Saturation of responses occurred and increased the internal validity. An additional potential limitation stems from the use of a convenience sample. It is possible that the mothers who volunteered for participation were self-selecting and not representative of the population. Two participants had been discharged from the NICU at the time of the interview. While these women were able to speak to their experience in the NICU and use of the webcam, their responses may have been influenced by the change in environment.

Nursing Practice Implications

This project explored and described some issues surrounding webcam utilization in this particular NICU and these findings can inform protocols for the use of webcams. For instance, the study indicates that nurses may benefit from further education regarding access to online components of the webcam and proper alignment of the camera. Several of the mothers reported that they called the NICU less frequently when the camera was working properly, and future research should examine the engagement with nursing staff while using the webcam. The results described the experiences of mothers in relation to the webcam. Analysis of the interviews

furthered the understanding of the role of webcam technology in supporting mothers in the NICU.

Products of the Capstone

The completion of this scholarly project will result in several products. First, this project will provide additional information regarding the pilot program of webcams in the NICU. Secondly, it will be produced in several scholarly cites. The DNP scholarly project will be archived and made available through submission to LIBRA, the scholarly repository at the University of Virginia. A manuscript version of the project will be submitted for publication in the peer-reviewed Journal of Obstetric, Gynecologic, & Neonatal Nursing based on their submission criteria (Appendix D).

Conclusions

This study provides valuable information regarding the experience of mothers utilizing a webcam in the NICU, adding to the growing body of literature. Further study is warranted to explore the use of a webcam and PPD, but the analysis supports the use of webcams as a method to include the mother and family in the care of the infant in the NICU.

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Tables

Table 1

Studies Examining Postpartum Depression Screening

Study	Subjects and Setting	Design	Intervention	Measure	Outcomes	Limitations
Bergstrom et al., 2012	Subjects: Mothers who had infants in the NICU for longer than 7 days between September 2004 and June 2005. Setting: Two Level II NICUs in Sweden.	Prospective cohort study	133 mothers completed EPDS at 1-month and 4-months following discharge.	EPDS, cutoff ≥12	1-month: 23% of NICU A 8% of mothers of NICU B (Total = 15%). 4-months: 18% of NICU A and 11% of NICU B (Total = 14%).	There was no screener performed while the infants were in the NICU.
Cherry et al., 2016	Subjects: Women who had an infant in the Neonatal Intensive Care Unit for at least 14-days. Setting: Neonatal	Pilot study of case reports	Feasibility study of universal screening A project coordinator met with mothers to introduce the PDSS at 14 days postpartum.	PDSS	385 of 793 eligible women completed the PDSS (48.5%). 137 (35.6%) had a positive screen and received a mental health referral.	The cutoff for a positive screen score is not listed. There was not a consistent method of providing the PDSS to mothers. Other strategies included having nurses provide the

Study	Subjects and Setting	Design	Intervention	Measure	Outcomes	Limitations
	Intensive Care Unit at a Southwest United States hospital.				117 (30.4%) significant symptoms.	PDSS and leaving the PDSS for the mothers to find with information.
De Magistris et al., 2010	Subjects: 213 mothers of infants in the NICU and mothers of healthy infants Setting: Hospitals in Cagilari, Italy	Cohort study	NICU mothers (n=113): 4 weeks Comparison group (n=100): follow-up visit at 4-8 weeks of infant age.	EPDS, cutoff ≥10 Qualitative interviews	Positive screen: NICU (23%) Mothers with healthy infants (8%).	Screeners were conducted with mothers in the NICU only once their infant had stabilized.
Hawes et al., 2016	Subjects: 734 mothers of preterm infants with NICU stays of ≥5 days Setting: Rhode Island NICU	Cohort study	Screened at 1-month post-discharge.	EPDS, Cutoff ≥10	Positive screen: N = 148 (20.2%)	Screened for PPD after discharge from the NICU.
Lefkowitz et al., 2010	Subjects: 60 mothers of infants in the NICU	Cohort study	Screened for depression at 3-5 days after admission and 30 days later	PDSS	Positive screen: n =23, 39% Subsyndromal: n = 10, 16.9%	Not all families were in the hospital at follow-up. Associated factors were not reported.

Study	Subjects and Setting	Design	Intervention	Measure	Outcomes	Limitations
	Setting: NICU in Northeastern U.S.					
Miles et al., 2007	Subjects: 102 mothers of preterm infants. Infants must have been <1500g or required mechanical ventilation Setting: 2 tertiary care NICUs in Midwestern U.S.	Longitudinal cohort study	Screened at enrollment in NICU and then at 2, 6, 9, 13, 18, 22, 47 months of infant age	CES-D, cutoff ≥16	Positive screen: Enrollment: 63% 2 mo: 30% 6 mo: 16% 9 mo: 18% 13 mo: 21% 18 mo: 12% 22 mo: 21% 27 mo: 13%	Homogeneity of demographics.
Rogers et al., 2013	Subjects: 73 mothers of very preterm infants (<30 weeks) Setting: Level III NICU at an urban hospital in Midwest US	Prospective cohort study	Screening at discharge from NICU.	EPDS, score ≥13 indicative of clinical depression	Positive screen: 20%	Urban setting may hinder external validity.
Segre et al., 2014	Subjects: 200 mothers of	Cross-sectional study	Screened for PPD and other maternal and	EPDS, cutoff ≥12	Positive screen: N=50 (25.5%)	No detail for the timing of the screening.

Study	Subjects and Setting	Design	Intervention	Measure	Outcomes	Limitations
	infants in the NICU Setting: Midwestern Level IV NICU		infant characteristics while in the NICU			
Vasa et al., 2014	Subjects: 131 mothers who had newborns in the NICU for greater than 14 days Setting: Special Care Nursery at Mercy Hospital and Medical Center in Chicago, IL	Case Reports	EPDS at two-weeks postpartum and every two weeks for the length of stay. Positive received referral to a social worker or their OB/GYN.	EPDS, likely PPD $\geq$10; positive screen cutoff $\geq$12	Score of $\geq$10 at two-weeks: 19.1%	There was no confirmation of a depression diagnosis with DSM criteria.

Note: CES-D, Center for Epidemiologic Studies-Depression Scale; EPDS, Edinburgh Postnatal Depression Scale; PDSS, Postpartum Depression Screening Scale

Table 2

Postpartum Depression Interventions in the Neonatal Intensive Care Unit

Study	**Subjects and Setting**	**Design**	**Intervention and Comparison Intervention**	**Measure**	**Outcomes**	**Limitations**
Bernard et al., 2011	Subjects: 39 women with infants in the NICU. Setting: NICU in California	Randomized Controlled Pilot Study	Intervention (n=25): Individual CBT with three sessions (45-55 minutes) over two weeks Control (n=25): Standard of care	BDI-II	BDI-II at follow-up: Intervention (M = 7.6) Control (M = 13.7; p = .06).	Use of self-report measures. Homogeneity of participants.
Carvalho et al., 2009	Subjects: Mothers of low birth weight (<1500 g) and preterm (< 37 weeks) infants. Setting: NICU in Brazil	RCT	Intervention (n=36): Enhanced group psychological support with educational materials. Control (n=23): Group psychological support	BDI	Significant reduction in depressive symptoms at follow-up for both groups (p = .04). No significant differences between groups (p = .47)	Control group also received psychological support.

Study	Subjects and Setting	Design	Intervention and Comparison Intervention	Measure	Outcomes	Limitations
Hagan et al., 2004	Subjects: Mothers of preterm (<33 weeks) or low birth weight (<1500g) infants in NICU. Setting: NICU in Australia	Prospective, single blind, RCT Randomization based on gestational age at delivery and parity.	Intervention (n=101): 6-session Cognitive Behavioral Therapy (CBT) between two- and six-weeks after birth. Sessions occurred weekly with a group for 2-hours. Comparison (n = 98): standard of care.	SADS	No significant difference in depression scores between the two groups at any time point. Intervention = 28.7% Control = 25%	The CBT content was based on depression treatment rather than on content proven to be effective in preventing depression. There may be a bias based on women willing to participate in randomized study.
Holditch-Davis et al., 2014	Subjects: 240 mothers Setting: Four NICUs: two in North Carolina and two in Illinois.	RCT. Comparison of three groups.	Intervention: Auditory-tactile-visual-vestibular (ATVV) and kangaroo care (KC) Comparison: Attention control	CES-D	No significant difference between groups for depressive symptoms.	Did not present data for each time point. Drop-out rate of 21%. Results may be confounded by the use of multiple interventions by mothers.

Study	Subjects and Setting	Design	Intervention and Comparison Intervention	Measure	Outcomes	Limitations
Lee et al., 2012	Subjects: 30 mothers recruited two weeks after infant was admitted to NICU Setting: NICU in Atlanta, GA	RCT pilot study	Intervention: Bright light therapy (30 minutes daily) for three weeks and sleep-hygiene information. Comparison: Placebo red-light visor and nutrition information.	EPDS SF-36v2	Trend toward lower depressive reports in intervention group at 3-week follow-up (d = 0.4)	Small sample size.
Melnyk et al., 2006	Subjects: 260 families, 245 mothers Setting: 2 NICUs (Rochester, NY and Syracuse, NY	RCT	Intervention: COPE program. Audio and print educational material presented in four phases. Enhanced education about parenting skills and resources. Comparison: Audio and print	BDI-II	Intervention group had significantly lower depressive scores at 2-month follow-up versus control (p = .02)	Educational material provided to both groups.

Study	Subjects and Setting	Design	Intervention and Comparison Intervention	Measure	Outcomes	Limitations
			educational material.			
Mendelson et al., 2017	Subjects: 12 studies, 1044 participants Setting: NICU	Meta-analysis	Interventions aimed at reducing maternal depression and anxiety symptoms. Studies must be compared to control group.		Interventions resulted in significantly lower depressive symptoms at follow-up. CBT and longer studies were associated with greater changes.	Limited number of studies and small sample sizes for included studies. Most of the included studies were pilots
Segre et al., 2013	Subjects: 23 mothers of pre-term (≤32 weeks) infants that scored ≥12 on EPDS Setting: Level III NICU in Iowa	Open trial pre/post-test	Listening Visits, 6 sessions of 45-60 minutes in length. Employed by trained Neonatal Nurse Practitioner.	EPDS	Depressive reports decreased at follow-up (t)22_ = -6.78, p<0.001). 12 (52.2%) "recovered," 2 (8.7%) "improved without recovery," 8 (34.8%) "no change," and one (4.3%) "clinically deteriorated."	No comparison group.

Study	Subjects and Setting	Design	Intervention and Comparison Intervention	Measure	Outcomes	Limitations
Shaw et al., 2013	Subjects: 105 mothers of preterm infants (≤ 34 weeks) who scored ≥20 on BDI-II Setting: NICU in California	RCT	Intervention: Adapted educational material from COPE study and manualized "trauma focused CBT." Six sessions (45-55 minutes) over 3-4 weeks. Comparison: Standard of care with one information session about the NICU.	BDI-II BAI	Intervention group had significantly greater reduction in depressive symptoms (Cohen's d = 0.41, $p < .001$)	Enhanced control group.
Silverstein et al., 2011	Subjects: 50 low-income mothers of preterm (<33 weeks) infants Setting: Two Level-III NICUs	RCT	Intervention: Four individual CBT sessions with a focus on education and problem solving. Comparison: Standard of care.	QIDS	No significant difference in depressive rates at 6-months for intervention versus control group (24% vs. 44%; relative	High rate of confounding variables and refusal rate (30%).

Study	Subjects and Setting	Design	Intervention and Comparison Intervention	Measure	Outcomes	Limitations
	in Northeast U.S.				risk 0.66, 95% CI 0.39, 1.11).	
Van Riper, 2001	Subjects: 55 mothers in of premature infants Setting: 5 NICUS in Ohio	Cross-sectional case study	Examined the effect of family-centered care and mother's perceptions of care for infant.	Ryff's 18-item measure of psychological well-being	Results: Overall psychological well-being was positively correlated with maternal education (0.47, $p < 0.01$), family income (0.44, $p < 0.01$), beliefs about family provider relationship (0.32, $p<0.05$), desires about family provider relationships (0.33, $p<0.05$), feelings of satisfactions (0.29, $p < 0.01$). Psychological well-being was inversely related to family functioning (-0.55, $p<0.05$).	Results are correlations, unable to determine causation between the variables. No true measurement of depression.

Study	Subjects and Setting	Design	Intervention and Comparison Intervention	Measure	Outcomes	Limitations
Welch et al., 2016	Subjects: 115 Mothers of preterm infants (26-34 weeks). Setting: Level IV NICU in New York, NY.	RCT	Intervention: Family Nurture Intervention (FNI). FNI employs calming measures for mother and infant through education. Comparison: Standard of care	CES-D, score of 16 or greater warranted a referral	38% had baseline scores above 16. At 4-month follow-up, there was a significantly higher rate of depression among the comparison group versus the intervention (17.5% vs. 2.5%; Fisher's exact test p = 0.028).	Potential selection bias related to drop-out rate.
Zelkowitz et al., 2011	Subjects: Mothers of low birth weight infants (<1500 g). Setting: Two NICUs in Montreal, Canada.	RCT	Intervention (n = 60): Cues program. This brief intervention entailed 6 sessions taught mothers to recognize and respond to their own stress and that of the infant. The first	EPDS, cutoff >12	At baseline, 39 (65%) of mothers in the intervention group and 41 (67.2%) of mother in the Care group met cutoff for likely depression. No significant differences between groups	Use of an active comparison group. 19% of participants lost to follow-up.

Study	Subjects and Setting	Design	Intervention and Comparison Intervention	Measure	Outcomes	Limitations
			5 sessions occurred in the NICU and the last while the infant was home. Comparison (n = 61): Care program. Six general infant care educational session.		for depressive symptoms at follow-up.	

Note: CES-D, Center for Epidemiologic Studies-Depression Scale; EPDS, Edinburgh Postnatal Depression Scale; PDSS, Postpartum Depression Screening Scale

Table 3

Characteristics of mothers with infants in the Neonatal Intensive Care Unit (N=12)

Characteristic	*N*	Percentage
Race		
White	9	75.0
African-American	3	15.0
Breastfeeding		
Yes	7	58.3
No	5	41.7
Residence by Distance from Hospital		
0-5 miles	1	8.3
5-10 miles	1	8.3
15-20 miles	0	0.0
20-25 miles	3	24.9
30-40 miles	3	24.9
40-50 miles	2	16.6
➢ 60 miles	2	16.6
Highest Level of School		
7^{th}-11^{th} grade	1	8.3
High school graduate	3	25.0
13-15	1	8.3
Some college	3	25.0
Completed graduate school	4	33.3
Employment		
Yes	3	25.0
No	8	66.7
Missing data	1	8.3
Other children		
Yes	6	50.0
No	6	50.0
Other children in the NICU		
Yes	1	8.3
No	11	91.7
History of Depression	2	16.6
Currently on medication	1	50.0
Positive PHQ-2	1	8.3

Table 4

Characteristics of infants in the Neonatal Intensive Care Unit (N=13)

Characteristic	*N*	Percentage	*M*	SD
Gestational Age			31.4	3.4
Day of Life at Enrollment			19.23	19.9
Weight (g)				
At Birth			1703.4	813.7
Enrollment			2010.77	734.98
Gender				
Male	6	46.2		
Female	7	53.8		
Reason for Admission				
Prematurity	11	73.9		
Diaphragmatic hernia	2	21.7		
Pre-study Intubation	1	7.7		
Post-study Intubation	1	7.7		
Pre-study Surgery	1	7.7		
Post-study Surgery	1	7.7		
Delivery				
Vaginal	6	46.2		
C-section	7	53.8		

Figure 1. Semi-structured interview guide

IRB-HSR#19023

Semi-structured Interview Guide

1. Can you tell me a little bit about your family? (Where are you from, who lives with you, ages of other children, etc)
2. Can you share a bit about your pregnancy? (Were there any concerns about [baby's name] health, How did you feel, etc)
3. Can you share with me what you know about [baby's name] health? (What concerns do you have, what questions do you have, etc)
4. How familiar were you with the NICU environment prior to [baby's name] admission?
5. What are your biggest fears?
6. How has the health care team helped you with those fears? What else has helped (information on web, friends, family members, etc)
7. What has your experience been with Angel Eye to date? (How do you access it, do you find it helpful, what would you change, etc)
8. What can you tell me about the support systems you have? (Including Angel Eye).
9. Do you have a prior history of Major Depressive Disorder?
    a. If yes, are you currently taking medication for depression?
10. Over the past two weeks, how often have you been bothered by little interest or pleasure in doing things?
    a. Not at all (0 points)
    b. Several days (1 point)
    c. More than half the days (2 points)
    d. Nearly every day (3 points)
11. Can you tell me about how you have engaged you with your baby using Angel Eye? (How has Angel Eye affected your level of interest?)
12. Over the past two weeks, how often have you been bothered by feeling down, depressed, or hopeless?
    a. Not at all (0 points)
    b. Several days (1 point)
    c. More than half the days (2 points)
    d. Nearly every day (3 points)
13. Can you tell me about your mood throughout the NICU stay? How has Angel Eye influenced this?

Version Date: 09/01/2017

Page Number: 1 of 1

Figure 2. Parent demographic survey

Angel Eye Study
Parent Demographic Survey

Please fill out this survey to the best of your ability. It should take no longer than 2 minutes.

What is your relationship to the baby?

- ☐ Mother
- ☐ Father
- ☐ Other: _____

What race do you consider yourself to be?

- ☐ White
- ☐ African American
- ☐ Pacific Islander, Native American
- ☐ Asian
- ☐ Other: _____

Are you of Hispanic origin (such as Mexican, Puerto Rican, Cuban) or other Spanish background?

- ☐ Yes
- ☐ No

How old are you? _____ years

What is the highest grade or year of school you have completed?

- ☐ 6 or less
- ☐ 7-11
- ☐ High school graduate
- ☐ 13-15
- ☐ College graduate
- ☐ Some graduate school
- ☐ Completed graduate school

Are you currently employed?

- ☐ Yes What kind of work do you do? _____
- ☐ No

What is your home zip code? _____

Do you have other children at home?

- ☐ Yes How many? _____
- ☐ No

Have you ever had a child in the NICU before?

- ☐ Yes
- ☐ No

Version Date: 04/28/16

Figure 3. Medical record review form

Parent ID: _____

Medical Record Review Form

Infant Demographics:

Gender M F Birth weight _____

Gestational age at birth: _____

Day of life on day of enrollment ____ Current weight _____

Delivery history Vaginal C-section

Multiple birth? Yes No

Mechanical ventilation: Yes No

Reason for admission:

Pre-intervention:

	Yes	No
Intubated		
Pressor support		
Surgical procedure last 5 days		
Breastfeeding		
Pod location		

Post-intervention:

	Yes	No
Intubated		
Pressor support		
Surgical procedure last 5 days		
Breastfeeding		
Pod location		

Version Date: 04/25/16

Figure 4. Institutional Review Board Approval

University of Virginia
Institutional Review Board for Health Sciences Research
HIPAA Privacy Board

IRB - HSR # 19023

Event:	Type:	Sponsor(s):
Approval Protocol Modification - Expedited	Protocol	Sponsor Protocol #:
		Principal Investigator: Elizabeth Epstein, BSN, MS, RN

Title: Parent and provider experiences with Angel Eye in the NICU

Assurance: Federal Wide Assurance (FWA)#: 00006183 **IRB#00000447**

Certification of IRB Review: The IRB-HSR/HIPAA Privacy Board abides by 21CFR50, 21CFR56, 45CFR46, 45CFR160, 45CFR164, 32CFR219 and ICH guidelines as compatible with FDA and DHHS regulations. This activity has been reviewed in accordance with these regulations.

Event Date: 08/18/17
Protocol Expiration Date: 04/16/18
Number of Subjects: 75
HSR Protocol Version Date: 08/18/17
Data Security Plan Date: 05/20/16

Current Status: Open to enrollment

Consent Version Dates:

Adult/Parental Permission Consent -- 08/16/17

Committee Members (did not vote):

Comments: The IRB determined the modification met the criteria for approval per the federal regulations and was approved. Modification expedited: minimal risk/minor changes.

The revised IRB protocol included the following key changes:
1) Pg 5: update the background section.
2) The semi-structured interview guide (dated 8/11/17) was revised to identify whether the subjects in this study exhibits signs and symptoms of postpartum depression.
3) Administrative changes.

The Adult/Parental Permission Consent revised accordingly.

The IRB-HSR official noted below certifies that the information provided above is correct and that, as required, future reviews will be performed and certification will be provided.

Name: Hein T. Ng, PhD Title: Member, Institutional Review Board for Health Sciences Research Phone: 434-924-9634 Fax: 434-924-2932	Name and Address of Institution: Institutional Review Board for Health Sciences Research PO Box 800483 University of Virginia Charlottesville, VA 22908

Approval:	Date:
Approved by Hein T. Ng, PhD From IP Address: 128.143.219.206	08/18/17 at 11:17 AM

Figure 4. Institutional Review Board Approval Protocol Modification

UVA IRB OnLine

University of Virginia
Institutional Review Board for Health Sciences Research
HIPAA Privacy Board

IRB - HSR # 19023		
Event: Approval Protocol Modification - Expedited	**Type:** Protocol	**Sponsor(s):** **Sponsor Protocol #:** **Principal Investigator:** Elizabeth Epstein, BSN, MS, RN
Title: Parent and provider experiences with Angel Eye in the NICU		
Assurance: Federal Wide Assurance (FWA)#: 00006183 **IRB#00000447**		
Certification of IRB Review: The IRB-HSR/HIPAA Privacy Board abides by 21CFR50, 21CFR56, 45CFR46, 45CFR160, 45CFR164, 32CFR219 and ICH guidelines as compatible with FDA and DHHS regulations. This activity has been reviewed in accordance with these regulations.		
Event Date: 09/01/17 **Protocol Expiration Date:** 04/16/18 **Number of Subjects:** 75 **HSR Protocol Version Date:** 08/18/17 **Data Security Plan Date:** 05/20/16		
Current Status: Open to enrollment		
Consent Version Dates: Adult/Parental Permission Consent -- 08/16/17		
Committee Members (did not vote):		
Comments: The IRB determined the modification met the criteria for approval per the federal regulations and was approved. Modification expedited: minimal risk/minor changes. Addition of one (1) question to the semi-structured interview: 1.Do you have a prior history of Major Depressive Disorder? a.If yes, are you currently taking medication for depression? No changes to the IRB protocol-template current and complete regarding assessing for depression. No changes required to the Adult-Parental Permission consent. Included with submission: 1. Semi-Structured Interview questions dated 9-1-17		
The IRB-HSR official noted below certifies that the information provided above is correct and that, as required, future reviews will be performed and certification will be provided.		
Name: Eileen C. Sembrowich, BS,BA,CCRP,CIP **Title:** Member, Institutional Review Board for Health Sciences Research **Phone:** 434-924-9634 **Fax:** 434-924-2932	**Name and Address of Institution:** Institutional Review Board for Health Sciences Research PO Box 800483 University of Virginia Charlottesville, VA 22908	
Approval: **Approved by** Eileen C. Sembrowich, BS,BA,CCRP,CIP **From IP Address:** 128.143.219.141	**Date:** 09/01/17 at 10:21 AM	

Figure 5. Taxonomic Analysis of Data

<table>
<tr><td colspan="8">Experience with webcam</td></tr>
<tr><td colspan="3">Baby in the NICU</td><td colspan="4">Cyber-parenting</td><td rowspan="2">Mother is ok if infant is ok</td></tr>
<tr><td>Health concerns</td><td>Infant not at home</td><td>Communication</td><td>Webcam technology</td><td>Role of mother</td><td>Interaction with infant</td><td>Shared experiences</td></tr>
</table>

Appendix A

Webcam Study Procedures

The present project will be integrated into a larger existing study being conducted by Drs. Epstein and Alhusen. The larger study is examining the feasibility of webcams in the NICU. Participants are enrolled after obtaining informed consent for the 14-day study. Technologies utilized include the cameras with computer and smartphone application access, virtual rounding, and messaging. Virtual rounding is the ability to record and upload videos of the infant on a NICU provided smartphone for future online access. The messaging platform is embedded into the system for providers to send a direct message to the family about the infant. Participants in the webcam study will complete the following measures: parent demographic form, pictorial representation of attachment, NICU parental beliefs scale, and a feasibility survey.

Appendix B
Study Consent Form

IRB-HSR #19023: Parent and provider experiences with Angel Eye in the NICU

Parent Consent
Consent of an Adult to Be in a Research Study

In this form "you" means a person 18 years of age or older who is being asked to volunteer to participate in this study.

Parents' or Guardians' Permission for Your Child to Be in a Research Study

Agreement of a Child to Be in a Research Study
(ages 15-17)

In this form "you" means the child in the study *and* the parent or guardian.

- ✓ If you are the parent or guardian, you are being asked to give permission for your child to be in this study.
- ✓ If you are the child, you are being asked if you agree to be in this study.

In this form "we" means the researchers and staff involved in running this study at the University of Virginia.

Participant's Name_____

Principal Investigator:	Beth Epstein, PhD, RN University of Virginia School of Nursing 202 Jeanette Lancaster Way Charlottesville, VA 22903

What is the purpose of this form?

This form will provide you with information about this research study. You do not have to be in the study if you do not want to. You should have all your questions answered before you agree to be in this study.

Please read this form carefully. If you want to be in the study, you will need to sign this form. You will be given a signed copy of this form.

Who is funding this study?

There is no funding for this study.

Why is this research being done?

The purpose of this study is to describe parents' experiences with the Angel Eye webcam system. We would like to learn whether the Angel Eye system helps parents get to know their

babies during their stay in the Neonatal Intensive Care Unit (NICU) and whether the Angel Eye system helps parents communicate with nurses and physicians in the NICU.

You are being asked to be in this study, because you are the parent of a baby in the NICU who may be using the Angel Eye system.

Up to 45 parents will be in this study at UVA. We will also speak to up to 30 providers to evaluate their experience with the Angel Eye system.

What will happen if you are in the study?

SCREENING

You will sign this consent form before any study related procedures take place.

STUDY PROCEDURES

During this study, you will have access to the Angel Eye webcam system as standard practice in the NICU which includes 3 parts:

- Webcam: You can see your baby from your home computer or smartphone and can talk to your baby;
- E-chat: You can ask questions of the nurses and doctors and they can type answers back to you. Sometimes this is in real-time. Most of the time this functions like email;
- Video-rounds: The team will create brief videos that summarize their discussion from morning rounds. This will be uploaded so you can view it at your convenience.

You may access the webcam as many times as you like, although the hours for when the camera is on will be limited. You may use the e-chat feature as much as you like as well. You may access the webcam even if you are not in this research study.

As part of this study, you will be asked to fill out some questionnaires. These questionnaires ask about how well the Angel Eye system is working. We will also ask you a few questions about yourself and your relationship with your baby.

Also during this study, we will do one interview with you while your baby is in the NICU and one interview about 4-6 weeks after your baby has been discharged from the NICU. The first interview will include questions regarding your experience with the Angel Eye system, experience with the health care team and symptoms of depression. We would like you to answer all of the questions, but you can continue on the study if you prefer to leave some questions blank. If the questionnaire suggests that you are feeling very badly about yourself, your Study Member may refer you to someone who can help you with those feelings. Your Study Member may be able to take you off the study if your feelings effect your participation or may be a harm to your health.

This second interview may be done by phone or in person. Both interviews will be audiotaped so that we can be sure we are accurate in understanding and remembering your responses to the questions.

The study team will also do the following:

- Review the contents of the e-chat messages and video-rounds you participated in from the Angel Eye system and calculate the number of minutes you were logged into the webcam system and the number of logins.
- Collect information from your baby's medical record.

Study Schedule

	Today	7-10 days after enrollment	4-6 weeks after discharge
Informed Consent	x		
Review study eligibility	x		
Parent demographic form	x		
Pictorial Representation of Attachment Measure	x	x	
NICU Parental Beliefs Scale	x	x	
Interview		x	x
Parent Feasibility survey		x	X

What are your responsibilities in this study?

You have certain responsibilities. These responsibilities are listed below:

- Answer all of the study-related questions completely.

How long will this study take?

Your participation in this study will require completion of seven surveys and two interviews. One in-person interview will be during your baby's NICU stay and a second interview will take place 4-6 weeks after your baby is discharged. The second interview may be done over the

phone or in-person. The interviews will last about 30-45 minutes each and the surveys will take approximately 5 minutes.

What are the risks of being in this study?

Risks and side effects related to the procedures include:
Rare:

- Emotional distress during the interviews if you recall a difficult emotional time during the NICU stay.

Risks of audio taping:
There is some risk to your privacy. We will not use names on the audiotapes (only your assigned study ID number) and if names are mentioned, they will not be transcribed. Audiotapes/files will be destroyed after they have been typed up and reviewed for accuracy.

Other unexpected risks:
You may have side effects that we do not expect or know to watch for now. Call the study leader if you have any symptoms or problems.

Could you be helped by being in this study?

You will not benefit from being in this study. However the information researchers get from this study may help others in the future.

What are your other choices if you do not join this study?

The only choice is not to be in this study. The care your baby receives in the NICU will not be affected in any way.

Will you be paid for being in this study?

You will be given a $20 gift card after each interview (for a total of $40). You should get your gift card at the end of the interview.

Will being in this study cost you any money?

All of the procedures in this study will be provided at no cost to you or your health insurance.

What if you are hurt in this study?

If you are hurt as a result of being in this study, there are no plans to pay you for medical expenses, lost wages, disability, or discomfort. The charges for any medical treatment you receive will be billed to your insurance. You will be responsible for any amount your insurance does not cover. You do not give up any legal rights, such as seeking compensation for injury, by signing this form.

What happens if you leave the study early?

You can change your mind about being in the study any time. You can agree to be in the study now and change your mind later. If you decide to stop, please tell us right away. You do not have to be in this study to get services you can normally get at the University of Virginia.

Even if you do not change your mind, the study leader can take you out of the study. One of the reasons for doing so may be that the study team believes the study is too emotionally burdensome for you.

If you decide to stop being in the study, we will ask you to please contact a member of the study team (see contact information at the bottom of this form).

How will your personal information be shared?

The UVa researchers are asking for your permission to gather, use and share information about you for this study. If you decide not to give your permission, you cannot be in this study, but your baby can continue to receive regular medical care at UVA.

If you sign this form, we may collect any or all of the following information about you:

- Personal information such as name, address and date of birth
- Your infant's health information if required for this study.

Who will see your private information?

- The researchers to make sure they can conduct the study the right way, observe the effects of the study and understand its results
- People or groups that oversee the study to make sure it is done correctly
- People who evaluate study results, which can include sponsors and other companies that make the drug or device being studied, researchers at other sites conducting the same study, and government agencies that provide oversight such as the Food and Drug Administration (FDA) if the study is regulated by the FDA.
- If you tell us that someone is hurting you, or that you might hurt yourself or someone else, the law says that we have to let people in authority know so they can protect you and others.

Some of the people outside of UVa who will see your information may not have to follow the same privacy laws that we follow. They may release your information to others, and it may no longer be protected by those laws.

The information collected from you might be published in a medical journal. This would be done in a way that protects your privacy. No one will be able to find out from the article that you were in the study.

What if you sign the form but then decide you don't want your private information shared?

You can change your mind at any time. Your permission does not end unless you cancel it. To cancel it, please send a letter to the researchers listed on this form. Then you will no longer be in the study. The researchers will still use information about you that was collected before you ended your participation.

Please contact the researchers listed below to:

- Obtain more information about the study
- Ask a question about the study procedures or treatments
- Report an illness, injury, or other problem (you may also need to tell your regular doctors)
- Leave the study before it is finished
- Express a concern about the study

Principal Investigator: Beth Epstein, PhD, RN
University of Virginia School of Nursing
202 Jeanette Lancaster Way
Charlottesville, VA 22903
(434) 982-3285

What if you have a concern about this study?

You may also report a concern about this study or ask questions about your rights as a research subject by contacting the Institutional Review Board listed below.

University of Virginia Institutional Review Board for Health Sciences Research
PO Box 800483
Charlottesville, Virginia 22908
Telephone: 434-924-9634

When you call or write about a concern, please give as much information as you can. Include the name of the study leader, the IRB-HSR Number (at the top of this form), and details about the problem. This will help officials look into your concern. When reporting a concern, you do not have to give your name.

Signatures

What does your signature mean?

Before you sign this form, please ask questions about any part of this study that is not clear to you. Your signature below means that you have received this information and all your questions have been answered. If you sign the form it means that you agree to join the study. You will receive a copy of this signed document.

Consent From Adult

_____	_____	_____
PARTICIPANT (SIGNATURE)	PARTICIPANT (PRINT)	DATE

IRB-HSR #19023: Parent and provider experiences with Angel Eye in the NICU

To be completed by participant if 18 years of age or older.

Person Obtaining Consent
By signing below you confirm that you have fully explained this study to the potential subject, allowed them time to read the consent or have the consent read to them, and have answered all their questions.

_____	_____	_____
PERSON OBTAINING CONSENT (SIGNATURE)	PERSON OBTAINING CONSENT (PRINT)	DATE

Parental/ Guardian Permission (for Medical Record Review of Infant)
By signing below you confirm you have the legal authority to sign for this child.

_____	_____	_____
PARENT/GUARDIAN (SIGNATURE)	PARENT/GUARDIAN (PRINT NAME)	DATE

Person Obtaining Parental/Guardian Permission
By signing below you confirm that you have fully explained this study to the parent/guardian, allowed them time to read the consent or have the consent read to them, and have answered all their questions.

_____	_____	_____
PERSON OBTAINING PARENTAL/ GUARDIAN PERMISSION (SIGNATURE)	PERSON OBTAINING PARENTAL/GUARDIAN PERMISSION (PRINT NAME)	DATE

Assent from Parent who is between the ages of 15-17
Consent from the parent/guardian MUST be obtained before approaching the child for their assent.

_____	_____	_____
PARTICIPANT (SIGNATURE)	PARTICIPANT (PRINT)	DATE

Person Obtaining Assent of the Parent (less than 18 years of age)
Consent from the parent/guardian MUST be obtained before approaching the child for their assent.

By signing below you confirm that the study has been explained to the child (less than 18 years of age), all questions have been answered and the child has voluntarily agreed to participate.

IRB-HSR #19023: Parent and provider experiences with Angel Eye in the NICU

_____	_____	_____
PERSON OBTAINING ASSENT (SIGNATURE)	PERSON OBTAINING ASSENT (PRINT)	DATE

Parental/ Guardian Permission (of parent ages 15-17)
By signing below you confirm you have the legal authority to sign for this child.

_____	_____	_____
PARENT/GUARDIAN (SIGNATURE)	PARENT/GUARDIAN (PRINT NAME)	DATE

Consent from Impartial Witness
If this consent form is read to the subject because the subject is blind or illiterate, an impartial witness not affiliated with the research or study doctor must be present for the consenting process and sign the following statement. The subject may place an X on the Participant Signature line above.

I agree the information in this informed consent form was presented orally in my presence to the **identified individual(s)** who has had the opportunity to ask any questions he/she had about the study. I also agree that the **identified individual(s)** freely gave their informed consent to participate in this trial.

Please indicate with check box the identified individual(s):
☐ Subject
☐ Parent(s)/Guardian of the subject

_____	_____	_____
IMPARTIAL WITNESS (SIGNATURE)	IMPARTIAL WITNESS (PRINT)	DATE

Appendix C
Script for Referral to Social Worker

"The social workers on the NICU are present to be of counseling support. I would like to ask your social worker to stop by to see you. Are you okay with that?"

Appendix D
Author Guidelines for Manuscript Submission to the Journal of Obstetric, Gynecologic & Neonatal Nursing

JOGNN
Journal of Obstetric, Gynecologic & Neonatal Nursing
AWHONN

Guidelines for Authors

The Journal of Obstetric, Gynecologic, & Neonatal Nursing (*JOGNN*) is the official journal of the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN). A peer-reviewed journal, *JOGNN* reflects practice, research, policies, opinions, and trends in the care of women, childbearing families, and newborns. *JOGNN* presents the scholarship that is the driving force behind nursing practice. Although not required, queries may be addressed to Nancy K. Lowe, CNM, PhD, FACNM, FAAN, Editor, *JOGNN*, University of Colorado Denver, College of Nursing, C288-28, 13120 East 19th Ave., Aurora, CO 80045. For additional information about *JOGNN* go to http://jognn.awhonn.org, e-mail jognn@awhonn.org, or call 877-234-3925.

Authors should submit manuscripts via the Internet at http://jognn.edmgr.com (Editorial Manager). Detailed instructions for first-time users are available on the Editorial Manager Web site. Once a manuscript is submitted in Editorial Manager, the corresponding author will be notified by e-mail.

The editor welcomes manuscripts in the following categories:

Research—reports of original studies that generate new knowledge for clinical practice.
In Review—systematic or integrated literature reviews, including specific implications for practice, policy, or research.
Principles & Practice—analysis of innovations and trends in clinical practice, care delivery systems, education programs, and public policy; reports of quality improvement and program evaluation projects with clear implications for practice beyond the study site using the SQUIRE guidelines (Cook & Lowe, 2012).
Case Reports—new information through case reviews of nursing and inter-professional care. Authors must provide written consent from the participant when clinical descriptions make identification possible.
Contemporary Perspectives—brief, critical commentaries on professional issues or societal trends.
Letters to the Editor—points of current interest or comments on an article published in the journal. The editor reserves the right to accept, reject, or excerpt letters. Letters should reference published articles no later than three months after publication.
In Focus—department within *JOGNN* that provides in-depth treatment of current topics.

Invited guest editors solicit focused manuscripts for review. Queries from potential guest editors of proposed series may be addressed to Marilyn Stringer, PhD, WHNP-BC, RDMS, stringer@nursing.upenn.edu.

Requirements for Submissions

1. Manuscripts must be original, not published previously, and not under consideration by another publication. The editor will consider publishing a complete report following the publication of preliminary findings (e.g., in an abstract) or presentations.
2. The authors must disclose any commercial interest they have in the subject of their study as well as the source of any financial or material support. Each author must complete a combined copyright transfer & author disclosure form, which will be uploaded with the manuscript files in the Editorial Manager system.
3. A copy of institutional review board (IRB) approval (or a letter from the IRB chair stating that approval for the study is not required) is required for any research published in *JOGNN*.

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In order to qualify as an author for a manuscript submitted to *JOGNN*, all persons designated as authors should qualify for authorship, and all those who qualify should be listed. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content. Such participation ordinarily includes all of the following:

- Involvement in conception or design of the project or other scholarly work
- Important contribution(s) to critical aspects of the conduct of the research or other scholarly work
- Drafting the manuscript submitted and revising it for important intellectual content
- Approval of the final, submitted version

Participation that does not qualify for authorship includes data gathering, provision of financial or other support, or review of a preliminary draft. When a large, multi-center group has conducted the work, the group should identify the individuals who accept direct responsibility for the manuscript.

The maximum number of authors usually permitted is six on research manuscripts and four on all other types of manuscripts. If more than these numbers of authors are desired, specific information explaining the role of each author should be included in a cover letter.

For further information visit the International Committee of Medical Journal Editors website at http://www.icmje.org/#author.

Reporting Guidelines

JOGNN has adopted the following reporting guidelines. Links on the author's resource page provide specific, detailed information about each of the guidelines and associated checklists. When submitting manuscripts, please use these checklists.

CONSORT
The CONsolidated Standards Of Reporting Trials (CONSORT) provides direction for reporting randomized controlled trials and includes the CONSORT Statement, a checklist focused on the structure of the report, and a flow diagram to document the progression of all participants through the trial.

STROBE
The STROBE guidelines stand for STrengthening the Reporting of OBservational studies in Epidemiology. Similar to CONSORT, these guidelines provide direction for the reporting of nonexperimental quantitative research.

PRISMA
The Preferred Reporting Items of Systematic reviews Meta-Analyses (PRISMA) provides standards for the preparation of reports of systematic literature reviews and meta-analyses. An expansion of the previous QUOROM Statement, PRISMA can be applied to reviews of randomized trials and other types of research and includes a checklist and flow diagram. Also review the guidance provided in "Systematic reviews" (Lowe, 2009).

MOOSE
The MOOSE guidelines provide specific

direction for reporting Meta-analysis Of Observational Studies in Epidemiology.

SQUIRE
The SQUIRE guidelines provide Standards for Quality Improvement Reporting Excellence. These guidelines should be used for all reports of quality improvement projects.

STARD
The STARD statement provides STAndards for the Reporting of Diagnostic accuracy studies.

CARE
The CAse REport (CARE) guidelines include recommendations and a 13-item checklist for guidance in writing a case report. Although written from a medical perspective, these guidelines are generally applicable to nursing case reports.

Preparation for all Manuscripts
Double-space all pages, including the abstract, text, references, tables, and legends. Use 12-point font and uniform margins of 1" at the top, bottom, right, and left. Do not right justify lines. Do not divide words at the end of a line.

Number pages consecutively. Include a shortened version of the title at the top of each page to identify the manuscript. The running head must not contain any author names or initials. In the left margin, consecutively number each line of text.

The average article in *JOGNN* is 15 to 18 manuscript pages, plus references, tables, illustrations, and callouts. Review articles can be longer than 18 pages if indicated.

Refer to the *Publication Manual of the American Psychological Association* (*APA*), sixth edition, for grammar, punctuation, and style; *Webster's Eleventh Collegiate Dictionary* for spelling of nontechnical words; *Dorland's Illustrated Medical Dictionary* for spelling of medical terms; and Haller and Holditch-Davis (2000) for guidelines on statistical reporting. In general, it is not necessary to specify the statistical package used to analyze research data. Use generic names of all drugs and products. Report physical measures in SI (International System of Units) units. For examples of conversion to SI equivalents, refer to the APA manual.

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Limit the title to no more than 15 words. Ensure that the title summarizes the main idea of the paper; is fully explanatory standing alone; and avoids the use of the words method, results, a study, and an experimental investigation. Colons in titles should be avoided.

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Submit 3–10 keywords with the abstract for use in indexing the article.

Abstract
Abstracts for Principles & Practice, Case Reports, Contemporary Perspectives, and In Focus Manuscripts (that are not research reports)
Include an abstract of no more than 75 words (in paragraph form). The abstract should be factual, not descriptive, and should provide the main points of the paper. Instead of saying what will be described, describe it.

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Include an abstract of no more than 250 words using the following headings:
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- Participants
- Methods
- Results
- Conclusion

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Include an abstract of no more than 300 words using the following headings:
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- Data Sources
- Study Selection
- Data Extraction
- Data Synthesis
- Conclusion

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Include an abstract of no more than 250 words using the following headings:
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Authors should provide a précis for use in the Table of Contents. The précis is a single sentence of no more than 25 words, written in the present tense and stating the conclusion(s) of the report. The précis should be similar to the abstract's conclusion.

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Provide three callouts of not more than 25 words each. Callouts highlight a major premise or conclusion of a manuscript. Indicate in the manuscript approximately where each callout should appear in the published article. Avoid repeating text found in the abstract or the first page. Callouts for research manuscripts should identify the problem the study addresses, the primary conclusions of the study, the major implication for practice, or factors that contribute to the conclusions of the study. Callouts for all other manuscripts should describe the major reason for addressing the topic of the manuscript, identify the primary conclusion, and identify the major implication for practice. Participant quotes are not appropriate as callouts.

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Authors are encouraged to submit supplemental files with their manuscripts. Supplemental data should enhance the content of the manuscript but should not be essential to the meaning. These files can include short video clips, interviews, data sets, evidence tables, additional figures, etc. and will be reviewed with the manuscript. If accepted, they will be available online. For additional information, please contact the managing editor at jognn@awhonn.org.

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