

EXPLORING FACTORS OF READINESS TO LEARN ABOUT INFANT FEEDING IN
MOTHERS OF NICU INFANTS

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Abstract

Teaching the postpartum mother who has an infant in the Neonatal Intensive Care Unit (NICU) about infant feeding may be delayed if the nurse does not determine readiness to learn (RTL) and confidence to feed (CTF) and/or makes assumptions about a lack of readiness based on the inherent stress of the situation. The purpose of this research was 1) to investigate the timing of maternal perceptions of RTL and CTF; 2) to compare maternal perceptions of RTL and CTF with postpartum nurse perceptions of the same, and 3) to investigate variables which may influence maternal perceptions of RTL and CTF. Research questions included: 1. When do new mothers perceive that they are ready to learn about infant feeding? 2. When do the nurses assigned to these mothers perceive that the mothers are ready to learn about infant feeding? 3. Are there differences in perception of timing of readiness to learn in the nurse-patient dyad? 4. How confident are new mothers about their ability to feed their infants? 5. How confident are the nurses assigned to these mothers about the mothers' ability to feed their infants? 6. Are there differences in the perception of confidence to feed in the nurse-patient dyad? 7. What is the relationship of level of state anxiety to mother's perception of readiness to learn? 8. What is the relationship of level of parenting experience to mother's perception of readiness to learn? 9. What is the relationship of level of maternal education to mother's perception of readiness to learn? 10. What is the relationship between maternal confidence in her ability to manage infant feeding and mother's readiness to learn?

Participants included a convenience sample of 25 maternal-nurse dyads in the antepartum and postpartum units of a regional medical center (five dyads were used for the pilot phase and 20 were used for formal data collection). Using a two-phased, descriptive, quantitative design, mothers were measured on their perception of RTL timing, CTF level, and state anxiety. Nurses

assigned to these mothers were also measured on their perceptions of the mothers' RTL and CTF. Primary and secondary statistical analyses were performed, looking at the impact of factors such as anxiety, previous parenting experience, and educational level on maternal RTL and CTF, using independent samples t-tests, Mann-Whitney, Chi Square, and Pearson correlation as appropriate, based on variable type and level of data distribution normality. Results of the pilot phase indicated that the newly-created RTL question and an existing CTF question had face validity and that the study protocol was deemed feasible by the nurses. Results of the formal data collection phase revealed that all mothers chose a RTL timing of "0", meaning that they were RTL now. Further results indicated that there was a statistically significant difference in values of nurses' perceptions of maternal readiness timing when compared across RN education level (Mean Rank 13.55 associate, 7.55 bachelor; $p = .023$). Pearson correlation revealed a statistically significant negative correlation between RN RTL and Maternal CTF ($r = -.475$; $p = .034$). The mean difference in RTL within the maternal-nurse dyad was 3.3 hours (95% CI [1.3/5.2]); that is, nurses' perception of their mothers' readiness to learn was, on average, 3.3 hours later than the mothers' own perception of their readiness. Statistically significant differences in nurses' perception of CTF were found when compared by maternal race type (Mean Rank 12.63 Caucasian, 7.31 African-American; $p = .047$) and level of maternal education (Mean Rank 8.58 high school, 14.07 college; $p = .046$). RN CTF was significantly correlated to RN Age ($r = .497$; $p = .026$) and RN Years as a nurse ($r = .479$; $p = .033$). The perception of confidence among maternal and nurse participants was significantly correlated using Pearson correlation ($r = .483$; $p = .031$). Anxiety level was significantly negatively correlated with maternal CTF ($r = -.500$; $p = .025$), nurse experience as an R.N. ($r = -.657$; $p = .002$), nurse experience as an obstetrical (OB) R.N. ($r = -.614$; $p = .004$) and RN age ($r = -.738$; $p < .001$).

Conclusions derived from the results indicated that, despite having some level of state anxiety and having an infant in the NICU, mothers were RTL now and were moderately to very confident to feed their infants. Older, more experienced nurses appeared to be a factor in this maternal confidence. Nurse perceptions appeared to be influenced by maternal characteristics and type of nursing degree. Implications of these findings include an alignment between maternal and nurse perceptions, the need to continue to perform a thorough psychological and physical assessment of the mother, and the importance of promoting teaching and learning for a mother experiencing NICU stress.

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Chapter 1: Introduction and Background

Significance

Perceptions related to readiness to learn vary among hospitalized patients. This variation is influenced by experiential, physiologic, and psychological factors (Chase, 2001). Within the postpartum environment, new mothers are faced with the dual challenge of learning self care and infant care, while recovering from childbirth. Some mothers are faced with the additional challenge of having a child who requires care in the neonatal intensive care unit (NICU).

The postpartum environment is the setting within which the relationship between the new mother and postpartum nurse develops. This is a unique relationship because it begins after the life-changing event of childbirth. The postpartum nurse provides the majority of teaching to the new mother, yet there is little research which focuses on the optimal timing for this teaching/learning. Also, much postpartum research takes place over a more protracted time period, like several weeks or months, as opposed to research which focuses on the immediate postpartum period (Brophy-Herb, Silk, Horodynski, Mercer & Olson, 2009; Vohr, Poindexter, Dusick, McKinley, Wright, Langer, et al, 2006; Weiss, Fawcett & Aber, 2009). And although there is much research focused on learning, the research seldom focuses on readiness to learn but rather describes it as a variable supporting other topics of learning (Lee & Bokovoy, 2004; Whyte, Watson, & McIntosh, 2006).

With the goal of establishing and maintaining an active connection with their infants, mothers may feel ready and willing to learn to care for their NICU babies (DeAzevedo & Mendez, 2008). Nurses may not be aware of this readiness, based on a lack of maternal communication, or based on the nurse's desire to protect the mother from any additional learning burdens beyond self-care during the child's NICU experience. Therefore, teaching may be delayed until later in the stay for a mother who is ready and willing to learn (Hadsell, 2011).

For those mothers who are ready to learn, it is vital for them to receive timely education in order to facilitate active participation in the infant's plan of care. Learning about infant feeding, either through breastfeeding, bottle-feeding, or pumping and storing breast milk, prepares the mother to perform this skill once the infant is stabilized. For the mother who cannot directly nurse her infant, either because of her own medical issues or her infant's, pumping and storing breast milk allows her to indirectly, but actively, participate in her child's care and nurturing (Lessen & Crivelli-Kovach, 2007; Spicer, 2001). Readiness to learn is an appropriate phenomenon to investigate within the context of learning about infant feeding.

Learning theory categorizes readiness as a perception related to learning, meaning that the individual determines that he or she is open to learn (Garrison, 1997). Readiness to learn is defined as the perception of being open to receive new information (Lawson & Flocke, 2008). It is important to measure the timing of the mother's perception of readiness to learn about infant feeding as well as her nurse's perception of the same, in order to determine the optimal time for teaching. Measuring readiness to learn also allows for reflective processing of missed opportunities; when teaching was delayed due to situational assumptions or lack of understanding on the part of the nurse.

Anxiety is a potential barrier to learning. Highly anxious patients are often too distracted to focus on learning, apply skills safely, or retain new knowledge. The stress associated with being hospitalized, having symptoms, and/or experiencing a change affects health information processing. Although a patient may attend to the teaching session, retention may be lacking when mediated by anxiety (Beckjord, Finney, Arora, Moser, & Hesse, 2008; Jopek, Gadzinowska-Szczucińska & Szczapa, 2009; Lee & Bokovoy, 2004). It is important, however, for the nurse to assess readiness to learn despite anxiety. Since the mother may be anxious

because of her infant's situation, active participation in the care of the infant may actually reduce the mother's anxiety (De Azevedo & Mendes, 2008; Hadsell, 2011). Determining the baseline emotional state of the mother is an important part of the nursing assessment.

Tilley, Gregor and Thiessen (1987) performed an extensive literature search which compared perceptions of caring behaviors between patients and nurses. They concluded that patients and nurses perceived caring behaviors in different ways. Nurses tended to equate caring behaviors to skills, while patients felt that behaviors such as active listening, which signified emotional support, best represented the idea of caring. This is applicable to the current topic, in that mothers and their nurses may have different perceptions of readiness to learn.

Similarly, other variables play a role in readiness. The degree of self-efficacy, or confidence in one's ability to parent, may influence the mother's readiness. Experiential and demographic variables play a part in one's self-confidence, so the new mother who has previous parenting experience or a college education may feel more confident and less anxious when approaching this new parenting situation (Bandura, 1977; 1997).

Learning in the postpartum environment is empowering to the new mother and may help to make an otherwise stressful situation less anxiety-provoking. Additionally, breast milk from mother or donor (both being optimal), or formula when mother's milk or donor human milk is not available, provides life-sustaining nutrition for the infant (Vohr et al, 2006). Since most deliveries are unscheduled, and because lactation consultants are not available 24 hours per day, it often falls on the nurse who is providing postpartum care to provide the initial education about infant feeding or pumping, especially if the mother and infant are separated due to medical instability.

Postpartum and NICU nurses are at a disadvantage when mother and infant are separated. It is difficult for the postpartum nurse to assess application of learned feeding techniques without real-time infant feeding interactions. Similarly, since NICU nurses care for medically-fragile newborns, where feeding is physiologically stressful and done in short periods of time, it is essential that the mother comes to these sessions prepared with a basic understanding of infant feeding techniques (Ekström & Nissen, 2006; Spicer, 2001) and that pumped breast milk is readily available (Silvestre et al, 2010; Slutzah, Codipilly, Potak, Clark & Schanler, 2010). Postpartum nurses are faced with the challenge of teaching in a void. They seldom have the opportunity to witness mother and infant together, so they must provide teaching when the mother is ready as a preparatory step for future feeding sessions. Since nurses cannot directly observe bonding behaviors between mother and child, such as eye contact or touch, they must rely on indirect readiness cues from the mother. Examples would include inquiries about the infant's status, talking about the child or their interest in feeding the child, in conjunction with stable vital signs and having an affect which is appropriate to the situation (for example, crying during a period of depression or smiling when expressing excitement about the new baby) (Hadsell, 2011; Whyte et al, 2006).

This study focused on women, who delivered an infant requiring admission to the NICU, and their assigned nurses. Recruitment occurred while the women were pregnant and on the antepartum unit due to prenatal maternal or fetal complications, and data collection occurred in the early postpartum phase, when mothers were returned to the antepartum or mother-baby units for their recovery. The antepartum unit was composed of 13 beds and staffed with 15 Registered Nurses. The mother-baby unit had 30 beds and nurses. The NICU was a Level III unit with 45

beds. The setting was a 650-bed, Level II trauma, teaching and regional referral hospital on the southeast coast of North Carolina.

Purpose

The purpose of this research was 1) to investigate the timing of maternal perceptions of readiness to learn and confidence about infant feeding; 2) to compare maternal perceptions of readiness to learn and confidence about infant feeding with postpartum nurse perceptions of maternal readiness to learn and confidence about infant feeding within the postpartum environment, and 3) to investigate variables which may influence maternal perceptions of readiness to learn. The goals were to produce evidence on the phenomenon of readiness to learn, to suggest optimal timing for teaching about infant feeding, to increase the knowledge base of postpartum nurses related to teaching new mothers, and to improve nursing practice in the postpartum setting by increasing awareness of the patient's readiness to learn as well as reducing situational assumptions.

Research Questions

1. When do new mothers perceive that they are ready to learn about infant feeding?
2. When do the nurses assigned to these mothers perceive that the mothers are ready to learn about infant feeding?
3. Are there differences in perception of timing of readiness to learn in the nurse-patient dyad?
4. How confident are new mothers about their ability to feed their infants?
5. How confident are the nurses assigned to these mothers about the mothers' ability to feed their infants?
6. Are there differences in the perception of confidence to feed in the nurse-patient dyad?

7. What is the relationship of level of state anxiety to mother's perception of readiness to learn?
8. What is the relationship of level of parenting experience to mother's perception of readiness to learn?
9. What is the relationship of level of maternal education to mother's perception of readiness to learn?
10. What is the relationship between maternal confidence in her ability to manage infant feeding and mother's readiness to learn?

Theoretical Framework

Given the number of factors influencing timing of readiness to learn and the current research questions, two theories were necessary to provide a framework for this study. The first theory, Bandura's Self-efficacy Theory (1977), posits that persons who believe that they can perform a task competently will view a difficult task as a challenge to be mastered rather than one to be avoided. With regard to parenting, Bandura (1997, p. 82) proposed that "individuals high in parental self-efficacy are able to guide their children through the developmental stages they face without serious problems or undue strain on their relationship with their spouse or partner." Research supports that maternal learning increases confidence (De Azevedo & Mendes, 2008; Ekström & Nissen, 2006; Mantha, Davies, Moyer & Crowe, 2008). It is reasonable to suggest that a new mother who feels confident in her ability to parent will be ready and willing to learn more quickly than one who does not feel confident. Confidence may both precede and follow learning. The new mother may have increased self-efficacy after achieving mastery of breastfeeding, for example (McQueen, Dennis, Stemler & Norman, 2011). Bandura made the theoretical connection between self-efficacy and positive parenting, but there is a gap in

knowledge related to self-efficacy and readiness to learn. Although self-efficacy is not being formally measured in this study, it is influenced by variables within the study, including educational level and previous parenting experience. These variables were chosen because Bandura emphasizes them in his theory as influencing confidence. And within this study, because educational level and parenting experience were used as conceptual bridges between self-efficacy and readiness to learn, education and experience were measured in an attempt to explore their relationship with readiness to learn. Self-efficacy influences the degree of contemplation to make a change, with readiness as a mediator which influences the level of thought, or perception of readiness, to make a change (Prochaska & DeClemente, 1984), such as learning about infant feeding in order to successfully incorporate a child into one's life.

Garrison's (1997) work provided the second theory for the study. He theorized that readiness to learn was a human state which allowed for openness to receive and apply learning in a productive way. This educational theory is similar to the aforementioned psychological theories in that it views readiness as a state or condition which is highly influenced by the characteristics and history of the learner as well as the outside environment. While readiness is influenced by outside factors, Garrison emphasized that learning must be active and self-motivated. The theory encompasses the challenges that a new parent may encounter as well as the necessary learning behaviors of parents.

Garrison's Self-directed Learning Theory (1997) is applicable to the comparison of maternal-nurse dyads in relation to perception of readiness to learn. Mothers as well as nurses are influenced by experiential and environmental factors. Their perceptions were measured individually, then compared to determine if and why there was a difference. Nurses must assess if, how best, and when parents can absorb new information within the postpartum environment.

Part of this assessment includes maternal physiologic health. Health is a personal factor which may influence readiness. Also within health is psychological health, which was measured via level of state anxiety. This is another personal factor which may influence timing of readiness.

Definition of Terms

The **antepartum unit** is defined as the hospital unit dedicated to caring for pregnant women with maternal or fetal complications. This unit may also care for these women postpartally. This is the unit on which data collection will occur

The **differences** in the perception of timing are defined as the degree of incongruence between maternal and nursing time frames for readiness to learn

Dyads are defined as the nurse-patient pairs; participating nurses will be assigned to care for the participating patients during a shift

Education is defined as level of completion of formalized training within primary, secondary, or higher education institutions of learning

Infant feeding is defined as breastfeeding, formula-feeding, tube-feeding, or pumping and storing breast milk for future use; given the infant's medical concerns, this feeding may occur in the present or future

New mother is defined as a newly-delivered mother

NICU stress is defined as the negative factors to which parents of an infant admitted to the NICU are exposed, such as isolation, unstable infant health, the intensive care environment, and disruptions to normal bonding activities.

Parenting experience is defined as having cared for a child - biological, adopted, or through marriage - prior to the current delivery

Physiologic state is defined as postpartum parameters of vital signs, blood loss, and pain level

The **postpartum** environment is defined as the acute care unit of the hospital which provides postpartum nursing care. This may include a dedicated postpartum unit or a women's unit which provides postpartum nursing care

Readiness to learn is a broad concept which can be understood from more than one perspective. Educational theory defines it as the state or condition of an individual that makes it possible for him or her to engage profitably in a given learning activity (Garrison, 1997). Psychological theory includes readiness as part of the trajectory toward change (Prochaska & DeClemente, 1984). For the purposes of the current study, readiness to learn is defined as the perception that one is open to embrace new knowledge in order to achieve a behavioral change

Self-efficacy is defined as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives" (Bandura, 1977, p. 191); since confidence is the reliance on one's own powers and this definition aligns so closely with that of self-efficacy, the two terms will be used interchangeably

State anxiety reflects a "transitory emotional state or condition of the human organism that is characterized by subjective, consciously perceived feelings of tension and apprehension, and heightened autonomic nervous system activity" (Spielberger, 1966). State anxiety should be distinguished from trait anxiety, which is a generalized measure of anxiety and a more stable personality trait

The **timing** of readiness to learn is defined as the number of hours from a set point when the mother feels both prepared and competent to learn as well as the number of hours from a set point when her assigned nurse perceives that the mother is prepared and competent to learn

Assumptions of the Study

1. Within the postpartum environment, new mothers are faced with the dual challenge of learning self care and infant care, while recovering from childbirth.
2. Some mothers are faced with the additional challenge of having a child who requires care in the neonatal intensive care unit.
3. The concept of self-efficacy, or the belief that one can adequately perform parenting roles, is related to the phenomenon of readiness to learn.
4. Having a physiologically unstable infant is stressful for new mothers.
5. Perceptions about readiness to learn by postpartum nurses are associated with timing of teaching.

Limitations

This study included a convenience sample of postpartum mothers. Only mothers whose infants were admitted to the NICU were asked to participate. A majority of maternal participants were hospitalized on the antepartum unit due to their high-risk pregnancies and were readmitted to that unit for postpartum care. Given the convenience sample and inclusion criteria, this study is not generalizable to all postpartum patients. And although physiologic state is related to readiness to learn, it was not feasible to include physiologic state as a research variable. However, maternal participants were screened for physiologic stability prior to responding to the surveys during the data collection phase. Only those mothers and nurses who agreed to participate were paired.

Significance of the Research

New mothers are influenced by multiple factors related to their personal histories, such as previous parenting experience and level of education, and those events which transpire after

giving birth, such as the health status of the child and mother. These factors influence the timing of their readiness to learn about infant feeding; one of the few avenues of care in which they may be involved while their infant is in the NICU. Nurses may base their perceptions about maternal timing of readiness to learn on external factors, such as caring for a mother whose infant is acutely ill. Nurses may make inaccurate assumptions about a lack of readiness based on their desire to protect the mother against further stress (Cloherty, Alexander, & Holloway, 2004). Nurses may perceive teaching and learning as stressful for the new mother, when this interaction may, in fact, decrease maternal anxiety because of its ability to offer active engagement in care of the infant. The nurse manages care of the new mother. If the maternal and nursing perceptions of the mother's readiness to learn differ, teaching will be delayed until the nurse perceives that the mother is ready. There is a difference between perception, however, and a conclusion based on facts gained through a thorough nursing assessment.

Measuring the timing of maternal readiness to learn may influence the timing of actual teaching about infant feeding. Timely teaching will encourage mothers interested in pumping breast milk to begin and continue this process as well as empower those mothers interested in breast- and bottle feeding with correct techniques to use with their NICU infants. Nursing interventions based on facts rather than assumptions will make breast milk available sooner for the NICU infant because the earlier the stimulation of lactation hormones, the earlier that breast milk will be produced (Chapman, Pincombe & Harris, 2012). Teaching will empower the new mother by giving her information about breast- and bottle-feeding techniques which she can demonstrate when direct feeding is indicated.

Summary

This chapter provides a foundation for the study of readiness to learn about infant feeding in postpartum mothers of NICU infants. Since readiness to learn is an instrumental factor in learning, readiness should be determined in real time. The study also provided the opportunity to determine if readiness was affected by demographic, experiential, physical, and psychological factors. Also, since nurses can assign assumptions to mothers of NICU infants, because those mothers have ill infants, nurses were included in the study by measuring their perceptions about timing of readiness concurrently with the postpartum patients to whom they were assigned. Whether or not the study elicited perceptions of readiness within the maternal-nurse dyad that were significantly different, it was of clinical significance to learn more about the connection between new mothers and postpartum nurses. If there was a lack of connection between perceptions within the dyad, training could be accomplished to foster evidence-based practice improvement. If there was similarity in responses, more investigation could be done into the rationales of participants and made transparent for nursing practice.

Chapter 2: Review of the Literature

Having an infant in the NICU is stressful for new mothers. Therefore, it is necessary to understand whether there is anxiety within this stressful environment, as well as whether anxiety, as well as other factors, affects readiness to learn within the population of NICU mothers. During the physical separation between postpartum mother and infant, the postpartum nurse provides support and encouragement, as well as empowers the mother through education about infant feeding. A review of the literature formed the basis for the research questions, which centered around the timing of readiness to learn, the difference in perceptions of readiness between mother and nurse, anxiety for the mother related to the infant's situation and whether or not experiential and demographic factors affected learning readiness.

Literature Related to Stress

Maternal NICU Stress

De Azevedo and Mendes (2008) described how mothers with infants in the NICU felt a loss of empowerment to influence the outcome of their child's stay. This loss of connection and control may lead to anxiety on the mother's part. Not only does the mother endure a physical separation, but she may feel powerless to take action to keep her baby healthy and happy. This was a qualitative and collective case study used to identify perceptions about the maintenance of lactation. Through interviews and observations, the authors identified themes related to maintenance and expression of breast milk. Although both psychological and physiological themes emerged, the authors chose to focus on the maintenance and expression themes, only, which makes the analysis less rich than it could be. Themes such as empowerment and a lack of connectedness were not as fully addressed as physiologic themes. This research describes lactation as a complex process and promotes teaching as a nursing intervention which can help to

bridge the gap between mother and infant. In order to empower the mother during this stressful time, it is necessary to recognize when the mother is ready to learn about infant feeding. This research is a basis for which further exploration associated with timing of maternal readiness to learn is appropriate.

Maternal stress levels may be decreased by involving mothers in basic care of their infants (Jopek, Gadzinowska-Szczucińska, & Szczapa, 2009). Ninety-eight NICU parents were measured using a postpartum stress inventory related to the NICU. The authors hypothesized that it is the lack of action and involvement which adds to the mother's burden of worry about her child's physical state. Despite this stress, mothers may still be interested in learning, so it is necessary to determine when the mother and her postpartum nurse believe that the mother is ready to learn. The latter measurement is one way to determine if the nurse has any assumptions about readiness based on the infant's admission to the NICU – the nurse may perceive that the mother is not ready to learn because she is too fragile, and delay teaching unnecessarily.

Wigert (2006) described feelings of “disruption and exclusion” reported by new mothers when they could not be involved with their infants. This was a qualitative study using a phenomenological approach, which allows for themes related to perceptions to evolve. This approach allowed mothers to describe their perceptions in retrospect, which elucidated the ongoing psychological impact that the feelings of disruption and exclusion presented. It was also retrospective in that mothers were interviewed post-NICU discharge, when their infants were six months to six years of age. Admission to the NICU represented a foreign environment, whether expected or unexpected. In many instances the mother is exposed to healthy infants if the newborn nursery is near the postpartum unit, so there may be a real sense of exclusion from the healthy bonding environment as well as exclusion from the highly technical and monitored area

of the NICU. Additionally, the notion of disruption evolves from the gap in the trajectory between giving birth and the normal postpartum routine, which would include time for feeding and bonding, application of learned skills, and discharge to home.

Erdem (2010) discussed how cultural norms influenced mothers in Turkey to have a higher anxiety level related to having a male infant admitted to the NICU versus a female infant. This was a descriptive, correlational design that utilized the State-Trait Anxiety Inventory. Despite gender differences, mothers associated the NICU experience with some level of anxiety. The authors recommended teaching as an intervention to decrease maternal stress. Like culture, other demographic and experiential factors may affect readiness to learn. This research measured whether these factors influenced readiness.

These studies illustrate how mothers may feel stressed, disconnected, and disempowered when their infants are admitted to the NICU. Action-oriented approaches by obstetrical nurses, such as teaching and providing exposure to the NICU environment may reduce anxiety and empower the mother, as well as provide applicable skills.

State Anxiety

New mothers perceive their birth and postpartum experiences differently. These mothers will, therefore, differ in their levels of state anxiety. Spielberger (1983) described state anxiety as a “reaction or process taking place at a given time and level of intensity” (STAI Manual, 1983, p. 13). The level of state anxiety is related to whether or not the individual perceives a situation as psychologically dangerous and is mitigated by previous experience. Previous experience, therefore, needs to be controlled for while measuring level of state anxiety in the postpartum population.

Birth can be considered a joyous event as well as a trauma. Trauma may include having an operative birth, whether planned or unplanned, as well as other events in the perinatal period (Elmir, Schmied, Wilkes, & Jackson, 2010). Elmir et al identified, via a metaethnography, six major themes, two of which are reminiscent of other literature on anxiety in the perinatal period, and, specifically, related to NICU stress – a lack of control and disruption. The level of state anxiety may be influenced by the perception of the childbirth experience, anticipatory fear of childbirth, or postpartum anxiety within the hospital environment or at time of discharge. Peripartum stress exposure increases the woman's risk of postpartum mood disorders (Hillerer, Neumann, & Slattery, 2011).

Within the population of NICU mothers, there may also be anticipatory anxiety related to a high-risk pregnancy or anxiety related to an unexpected health crisis of the newborn. Adams, Eberhard-Gran, Sandvik, and Eskild (2012) measured emotional stress in over 55,000 women from 30 weeks gestation to six months postpartum over a decade, using the variable of delivery type, and concluded that mode of delivery did not significantly affect levels of emotional stress. Emotional distress during childbirth was related to emotional distress at 6-months postpartum. Childbirth, coupled with admission to the NICU, could, therefore, be considered a traumatic event for the mother. Mothers may respond with heightened state anxiety or a diagnosable postpartum anxiety disorder.

Alder (2011) studied the relationship between fear of delivery and postpartum responses and found that state anxiety was a mediating factor between fear of delivery and stress exposure. This suggests that state anxiety affects the way that women respond to the stress of delivery and the level of psychological trauma associated with it. State anxiety could also be measured in a

similar way in the postpartum population in order to determine its level of effect on NICU stress response.

These studies illustrate the ideas of perception of the birth experience and anticipatory anxiety related to it. These cognitive patterns exert a strong influence on the overall perinatal experience and play a part in postpartum recovery.

Summary

The perinatal experience has the potential to be a stressful experience for mothers. Coupled with predictable perinatal stress is the added burden of having one's newborn suffer health complications and be admitted to the NICU. Multiple experiential and emotional factors are now coming into play. Themes such as lack of control and disruption have emerged in research and impact the mother's readiness to learn. Despite the stressful events, learning about infant feeding is a way for mothers to stay connected to their infants, even when physical distance separates them.

Literature related to Teaching within the Nurse-patient Relationship

Teaching in the Perinatal Area

Some infants will leave the NICU with ongoing medical needs. Baker, Kuhlmann, and Maglioro (1989) discussed how the nurse-patient relationship, between nurse and parents, and nurse and infant, helps to form a positive environment in which teaching can take place. This is clinical literature written by health educators and not research, and, as such, can only generate intuitive hypotheses about relationships. Baker et al also discussed how trust in the nurse's care is related to trust in the content of the teaching material. Establishing rapport with the postpartum nurse may increase the trust level related to the teaching being delivered. If the postpartum mother feels comfortable in her hospital environment and feels supported while her

infant has medical needs, she may feel more comfortable and more ready to learn. Having established a rapport with the patient may also affect the nurse's perception about the timing of that patient's readiness to learn. The nurse may perceive the patient as more comfortable and confident, which may encourage the nurse to perceive that the patient is ready to learn earlier than if the patient seemed anxious.

Ekstrom and Nissen (2006) demonstrated how excellent breastfeeding education by nurses leads to a feeling of empowerment by new mothers. Breastfeeding education was the intervention and was determined to have a significant relationship with confidence level. Education stems from the nurse-patient relationship in that, as the nurse learns more about her postpartum patient, the nurse develops a more tailored teaching plan. The nursing assessment and knowledge of the patient as an individual is also related to the nurse's perceptions of that patient. The strength of the nurse-patient relationship may affect how quickly the nurse perceives the mother to be ready to learn.

Lessen and Crivelli-Kovach (2007) described the obstacles that women may face, including "insufficient support and education as well as unsupportive hospital practices" (p. 256), and how improving upon these factors could ultimately increase the incidence of breastfeeding. The researchers studied how neonatal, maternal, and outside influences affected the initiation and duration of breastfeeding and concluded that maternal education and parity, among other factors, influenced the incidence of breastfeeding as well as pumping breast milk. Of the 100 mothers interviewed, 15% of this population continued to breastfeed at the two-year point. NICU mothers who wish to breastfeed directly or pump may also be influenced by these demographic and experiential factors. Education and previous parenting experience may make the NICU mother more receptive to teaching about infant feeding.

Panagl, Kohlhauser, and Pollak (2005) performed a study which provided the intervention of psychological support to parents of NICU infants upon admission and just prior to discharge. The intervention consisted of offering support and counseling to address the psychological impact of NICU stress. The intervention was part of a prevention strategy to decrease psychosocial problems post-discharge. Additionally, nursing and medical staff in the NICU were sensitized to these issues in parents. This study illuminates the issues of NICU stress and the need for perinatal nurses to be knowledgeable about the psychosocial stressors that parents face. These stressors must be taken into account during the nursing assessment. Understanding the psychological needs of the NICU mother will lead to a more informed nursing assessment, which may increase the potential for accurate nursing perceptions of readiness to learn in the mother. Additionally, teaching the new mother may be considered an avenue of support.

Morey and Gregory (2012) used a repeated-measures, nurse-led intervention to improve learning for NICU parents prior to the birth of their infants. They exposed parents to information and measured parents' knowledge level prior to and immediately after the intervention as well as two to three days after their infants were admitted to the NICU. Knowledge exposure related to several variables within the NICU experience, such as staffing or sights and sounds, significantly improved knowledge level. This proactive teaching experience empowered mothers and helped to establish a rapport between parents and the nursing staff. Increasing the knowledge base of antepartum mothers played a significant role in their adaptation to parenting a child in the NICU.

Cleveland (2008) performed a systematic literature review to identify NICU parental needs and appropriate nursing interventions to support these parents. Sixty studies, both quantitative and qualitative, were identified and several parental and nursing themes were identified, some of

which relate to the current research. Parents, for example, wanted to feel included in the care of the infant. Previously-mentioned literature has identified a feeling of exclusion in NICU parents.

Weiss, Fawcett, and Aber (2009) discussed that when women have an unscheduled cesarean delivery, they report an increase in negative feelings about their postpartum adaptation. The study was a mixed methods design which involved interviews as well as fixed-response surveys. Over 200 mothers were involved over a two-year period. Additionally, nursing assessments were collected with accompanying recommendations for nursing interventions. It was recommended that early postnatal assessment be completed and post-discharge teaching be offered. This research is aligned with one of the aims of the current research – to measure nursing perceptions of readiness to learn in postpartum patients, to compare perceptions within the dyad, and to improve nursing practice. In 2009, approximately 33% of births in the United States were of the cesarean type (Jayson, USA Today, 12/21/10), the recovery from which adds to the physical burden of the mother. Women who undergo cesarean delivery expressed feelings of anxiety due to the lack of preparedness for surgery. Add to this a NICU admission and you have the stressors of recovery from major abdominal surgery, physical separation from the infant, and loss of empowerment to actively support the infant's health. The proposed research measured variables associated with learning and anxiety in both the vaginal and cesarean delivery populations. In the latter population, there is a reciprocal separation of mother and infant. This is a situation in which teaching is vital in order to bridge the physical gap between mother and infant through empowerment.

These studies center around building rapport and supporting new mothers who have undergone varying birth experiences and infant health conditions. Rapport is related to trust and

positive outcomes. These studies also support the idea of empowerment, from the previous section, of mothers via teaching and exposure to the NICU environment.

Teaching with Other Patient Populations

Teaching as part of the nurse-patient relationship can also be understood more broadly, in the context of the nurse learning how to teach, i.e., recognizing learning styles or readiness cues. Nurses teach within a wide scope of medical scenarios. Bylund, D'Agostino, Ho, and Chewning (2010) discussed concordance-based patient communication. The concept is described as one where not only the clinician is trained to communicate well with the patient, but the patient also is trained to communicate clearly. This research provides a literature review on existing patient communication practices as well as discusses interventional gaps related to those receiving complementary medicine as well as the underserved population. Because a nurse provides teaching, the nurse doesn't necessarily know how to teach. Additionally, the nurse should not assume that because the patient is occupying a bed, he or she is ready to learn. The two partners need to communicate. This research relates to the current research in that the nurse-patient relationship impacts communication and part of communication is the level of astuteness of the nurse to be aware of readiness to learn cues; the latter was measured by comparing the perception of readiness to learn within the dyad.

Grahn and Johnson (1990) surveyed cancer patients, their family members, and oncology staff to determine how emotional stress related to the diagnosis impacted the ability to learn. They proposed the consideration of individual learning needs when planning patient education, based on the finding that patients desired learning but did not always communicate this need to staff. The nurse is in a prime position to determine the needs of the patient within the nurse-patient relationship that develops. There appears to be a gap between patients' needs and the

actual teaching, making the measurement of readiness a key factor in teaching and learning. Additionally, emotional stress, which can be measured by level of state anxiety, is described as a barrier to communication and learning.

Lee and Bokovoy (2004) performed a descriptive study, using a convenience sample of vascular surgery patients. They hypothesized that patients would not recall all of the information related to discharge teaching a few days after surgery that was presented by a Registered Nurse just prior to surgery. They suggested that stress related to the surgical experience mitigated recall and understanding of instructions. Despite the nurse-patient relationship, established through the teaching scenario, learning and retention was impacted by stress. The nurse must consider all of these factors when planning teaching and must establish a rapport with the patient in order to provide teaching within a supportive environment.

Whyte, Watson, and McIntosh (2006) discussed barriers to the development of a relationship, including the nurse's lack of confidence, lack of content expertise, and the perception that teaching is additional to the basic nursing role, rather than being integrated within it. These researchers used a qualitative case study design that followed 12 nurses via taped conversations with patients and survey completions. Nurses wore microphones during their daily practice in order to capture real-time interactions with patients related to smoking cessation education. Nurses included information about smoking cessation but the content of the teaching was lacking somewhat. Nurses reported that they lacked teaching skills and content expertise. This illustrates the important role of teaching as part of the nurse-patient relationship. Nurses can communicate as well as establish rapport with their patients, but the content and quality of the interactions may be lacking without a well planned and executed teaching session.

This section focuses on the ideas of nurse as teacher and how the psychological impact of illness and treatment is often stronger than the physical symptoms associated with it. First, teaching is learned skill which is not necessarily present simply because one is a nurse. Nurses must learn this art through repetition and look for readiness queues in their patients. Second, learning about one's illness and treatment, and receiving support by nurses can lessen the psychological burden and improve outcomes.

Incongruent Perceptions between Nurse and Patient

Tilley, Gregor, and Thiessen (1987) compared nurses' and patients' perceptions of the nurse's role in teaching. The mean responses to a questionnaire, developed by the researcher, were compared within and between two hospital settings. The questionnaire measured the perceptions about type and process of nurse-led teaching in 38 nurse-patient dyads. Although patients recognized the role of nurses in teaching, a majority of them chose to have a physician deliver health teaching. Nurses, on the other hand, perceived that a nurse was best suited to deliver this information. This research promotes the idea of communication and assessment within the nurse-patient relationship.

Lee and Yom (2006) compared nurses' and patients' perceptions about quality of care of the nursing and medical staff. Of the over 200 patients and 200 nurses surveyed, a majority of nurses rated their individual performance as higher than the ratings from patients. A majority of patients rated overall care and their willingness to return to the hospital for future care as higher than the nurses rated the care. Therefore, patients rated their general hospital experience as higher than their nursing care and nurses perceived that they provided higher-quality care than they actually provided in the eyes of the consumer. This is another example of the necessity of good communication and a thorough assessment by the nurse. In order to individualize care and

teaching, it is important to understand the patient's needs and avoid assumptions based on generalities or personal opinion.

Nurses teach within a broad spectrum of patient scenarios. Teaching is an art form and requires a period of time for proficiency. Patients have individual needs and teaching should be tailored to the particular patient and situation. This section illustrates several examples of how the nurse assists NICU mothers to incorporate this stressful situation in a positive way, through teaching and support. As teacher, the nurse engages in a nurse-patient relationship and is able to empower the new mother via teaching. Within other settings, the nurse forms the same type of relationship, but from a different perspective, i.e., discharge teaching after surgery or teaching coping skills to deal with a new diagnosis. Throughout the course of the relationship, whether it is exemplified through a brief intervention, or ongoing bedside care, the nurse must thoroughly assess each patient as an individual in order to partner with the patient to develop teaching that is viable and appropriate. To individualize the teaching, the nurse must avoid assumptions about the patient or replacing the patient's perceptions with nursing perceptions. The dyad must communicate as a team, meaning that the nurse and mother must make transparent their needs and perceptions. When the nurse-patient relationship fosters clear communication and exists concurrently with a thorough nursing assessment, the dyad is a team with a common goal of teaching and learning, empowering the mother to deliver safe and effective infant care.

Literature related to Readiness to Learn

Self-efficacy

Bandura developed a general theory of self-efficacy (1977) and later refined it to include a theory of parental self-efficacy (1997). He proposed that parents with a high degree of self-efficacy would possess the confidence to be competent parents (Bandura, 1997, p. 82). Self-

efficacy theory also includes concepts of knowledge and satisfaction (Bandura, 1977, p. 191). Parents who possess knowledge through previous experience or education tend to act in a competent manner. Parents who feel effective tend to have high levels of parental satisfaction. Although Bandura's theory does not directly connect self-efficacy with readiness to learn, the two concepts share commonalities. Anxiety, for example, affects confidence and readiness to learn because it usurps energy, negatively affects health status and distracts from learning (Hillner et al, 2011). The level of perceived self-efficacy is also affected by the environment, part of which is the nurse-patient relationship, the content of teaching, and the perceived level of support. Bandura discussed the connection between self-efficacy and the environment when he described self-efficacy as being task-specific. The ability to accomplish a task, such as infant feeding, is dependent upon the level of support that is perceived in the learning environment, among other factors (Bandura, 1995). Bandura's theory is the first of the theories, discussed in this section, which helped to form the guiding framework for this study related to readiness to learn.

Ngai, Chan, and Ip (2010) found that postnatal perceived maternal competence and satisfaction were predicted by prenatal perceived maternal role competence and learned resourcefulness, as well as other factors. This was a longitudinal, descriptive design with 184 primiparous women who were measured on five different scales, including those directed toward parental competence and depression. The authors concluded that healthcare should "equip women with the learned resourcefulness skills to facilitate maternal role taking and enhance women's sense of competence and satisfaction in the maternal role" (Ngai et al., 2010, p. 186). There was correlation between learning practical skills and feeling confident as a parent.

Although the study focused on mothers with healthy infants, one could hypothesize that mothers of NICU infants would feel more confident after mastering a skill as well.

Porter and Hsu (2003) investigated first-time mothers' perceptions of efficacy pre- and postnatally and its links to infant temperament. There was a positive association between positive infant temperament and higher level of self-efficacy. The authors also reported that perceptions of self-efficacy were refined from a global sense to a more refined one.

Additionally, self-efficacy improved with parenting experience.

Salonen et al (2010) found that new parents reported a higher sense of parenting satisfaction after they experienced learning. Parents were given the What Being the Parent of a New Baby is Like - Revised measurement in the hospital and at one week postpartum. The convenience sample of 1200 parents was drawn from a larger project and the measurement was given at two different hospitals prior to the larger study's experimental intervention. Level of parental self-concept, which is a way to describe oneself as a parent, and includes a qualitative judgment of one's ability to parent, was one of the factors contributing to variance in parenting satisfaction. This variance relates to Bandura's theory which links self-efficacy and parental satisfaction. Additionally, family functioning contributed to variance, suggesting that social and experiential factors contribute to satisfaction.

These studies connect self-efficacy to confidence, and confidence to parental competence. Confidence is related to parenting satisfaction. The more that a parent believes that he or she can handle the challenge of parenting, the better the psychological outcomes related to the parenting role.

Factors affecting Self-directed Learning

Garrison (1997) described readiness to learn as a state within which the learner is open to receiving new information. Readiness is influenced by the environment and the learner's characteristics and history. In the hospitalized patient, readiness is influenced by sights, sounds, smells, and sensations as well as physiologic feelings of pain or exhaustion. Readiness is also influenced by the patient's support system, education, and life experience. While Garrison paid homage to outside influences, he proposed a theory of self-directed learning, where the learner determines the timing and application of the learning. The learner is, therefore, responsible for his or her own learning. The teacher is used to provide clarification of the content because the learner lacks content expertise during the process. Garrison's theory represented the second part of the guiding framework for the current research on readiness to learn.

Abd-El-Fattah (2010) studied the application of the three psychological constructs of Garrison's model, self-management, self-monitoring, and motivation, with 199 undergraduate education students. Students responded to a questionnaire, the Self-directed Learning Aptitude Scale. Path analysis, used to examine the causal relationship between two or more variables, showed that the quality of self-management was the strongest predictor of academic achievement over two semesters. This research is applicable to learning situations in the hospital in that the combination of external and personal factors along with the patient's readiness and motivation to learn need to be taken into account when the nurse is planning a teaching session. The nurse must provide guidance and clarification during the process as well.

Beagley (2011) discussed health literacy, culture, language, and physiologic state, the environment, and learning styles as potential barriers to learning in the perianesthesia area. The author described readiness to learn as comprised of academic and biologic readiness. Within the

category of biologic readiness, factors include age-related processing capabilities, pain, mobility level and anxiety. This is a descriptive manuscript that provides a thorough background on the barriers. Physiologic readiness is salient to the current research. It goes hand in hand with psychological readiness. The NICU mother must possess both before she can learn and these factors impact her timing of readiness. A thorough physical assessment is necessary to assist the nurse in determining whether the patient is ready and able to learn.

Lindeman (1988) provided an insightful metaanalysis of 120 qualitative and quantitative studies related to patient education. Salient learner characteristics included demographics, educational level, and family preparedness. Motivation and job description were some of the significant nurse characteristics. Only two of the 120 studies used nurse characteristics as main variables; rather, they were used as secondary variables. The current study measured the level of formal education and previous parenting experience to determine if they played a significant role in the timing of readiness to learn.

Tiivel's (1997) research reflects many of the hypotheses in previously-mentioned research. The teaching intervention becomes more complicated when the client is ill and vulnerable. There are barriers to learning. The nurse must be "astute" to recognize readiness to learn cues. It is better to proactively teach than reactively respond to a crisis which has developed due to a lack of patient preparation. Thoughtful planning will, hopefully, lead to a better teaching session. Although this descriptive research focuses on the elderly client, these concepts are applicable to all patients, including NICU mothers. The NICU mother may have health complications, feel vulnerability for herself and her baby, have barriers to learning such as anxiety or low education level, or may not necessarily voice concerns or readiness to learn.

Weiss and Lokken (2009) used a correlational design with path analysis to test the predictive relationship of variables associated with postpartum mothers' readiness for hospital discharge. Questionnaires were distributed to 141 mixed-parity mothers pre-discharge and a phone questionnaire was facilitated three weeks post-discharge. Information related to sociodemographics, hospitalization factors, and quality of teaching were collected and the measurement was the Readiness for Hospital Discharge. The largest percentage of variance was explained by the difference between mother's learning expectations and the actual content that was delivered, as well as the quality of teaching. Discharge readiness was positively associated with coping after discharge. Patient characteristics and hospitalization factors, among others, were predictive of use of support services, during and after hospitalization. This study supports the need for a thorough nursing assessment of postpartum mothers, to determine their readiness and content needs for learning. It also reflects the patient's critical analysis of the teaching she receives and the importance of customizing teaching to the patient. Patients who felt more ready to leave possessed more confidence and knowledge, leading to better coping at home.

Multiple factors influence readiness to learn. Patients who are ill or vulnerable, such as NICU mothers, bring with them multiple variables which affect their readiness, learning, and application of knowledge. These factors include health status, formal educational level and previous parenting experience, among others. Physical and emotional health influence learning. The psychological component of learning is as powerful an indicator as physical symptoms. Several of the previously mentioned studies have illustrated how the feelings associated with being a vulnerable patient are more or most influential in the ability to learn and maintain healthy behaviors. There are many similarities between the general patient population and postpartum patients – all bring various levels of experience with health conditions, familial support, or

coping skills. It is vitally important that the postpartum nurse identifies historical information as well as current readiness cues and be prepared with relevant, accurate information to impart to the patient.

Psychological Readiness

Balfour et al (2006) used psycho-educational methods to prepare patients with no previous experience taking highly active antiretroviral medications to take them. Given the strong side effects of the medications, patients tended to have a high level of anxiety prior to taking them. Additionally, these HIV positive patients lived with depression and anxiety because of their diagnosis. The education included information about the medications as well as a psychological component, which included four standardized sessions offering coping strategies for stress and depression. This was a new intervention, tested on 63 HIV-positive patients within a randomized, controlled trial. Those in the intervention group had improved readiness to take the medications and decreased depression after four weeks, as compared to the control group.

Cohen, Clark, Lawson, Casucci, and Flocke (2011) performed a cross-sectional observational design involving audio recordings of 811 physician-patient interactions. Conversational analysis was used to search for teachable moments, or those instances when a needed health behavior change is identified. Approximately 10% of these conversations contained teachable moments, illustrating the importance of physician identification of these opportunities. Similarly, nurses are likely to be presented with teachable moments during their interactions with patients. In order for health care providers to identify these opportunities, they must be aware of readiness cues, such as identifying a health concern, making a link between the concern and a potential behavior, and committing to the behavior.

Hadsell (2011) explored the concept of psychological readiness in a descriptive manuscript, based on a literature review and clinical observations, which was intended to assist postpartum nurses in the absence of a lactation consultant. These nurses are often the sole clinician who is available to provide information about infant feeding techniques, such as breastfeeding, bottle-feeding, or pumping and storing breast milk, especially on evening and night shifts. The paper offered suggestions about appropriate questions to ask the new mother to elicit the level of readiness to learn. Hadsell also cautioned against making assumptions about a lack of readiness for mothers of NICU infants based solely on this stressor. Hadsell encouraged nurses to perform a thorough assessment, be aware of readiness to learn cues (such as asking about the infant or about breastfeeding), and impart knowledge in order to empower mothers. Lawson and Flocke (2006) described the teachable moment as not necessarily unpredictable and as one that can actually be created within the clinician-patient dyad.

Olinzock (2004) described the creation of a model used to assess and facilitate learner readiness for self-directed care for individuals with spinal cord injuries. This was a qualitative, retrospective review of 50 patient records which identified several learner readiness stages and nursing roles. Stages ranged from dependent to self-directed, the ultimate goal of teaching. These stages are similar to the stages of change in that the patient moves from a point of having no insight into the need to change, to learning a new behavior and maintaining it. Both of these stages have the potential to empower the patient.

Wong et al (2009) performed a qualitative study related to the self-administration of home hemodialysis and the emergent themes which stemmed from the experiences of patients who were learning through illness. The research included semi-structured interviews and a focus group with a total of 23 patients with end-stage renal disease and their caregivers. For these

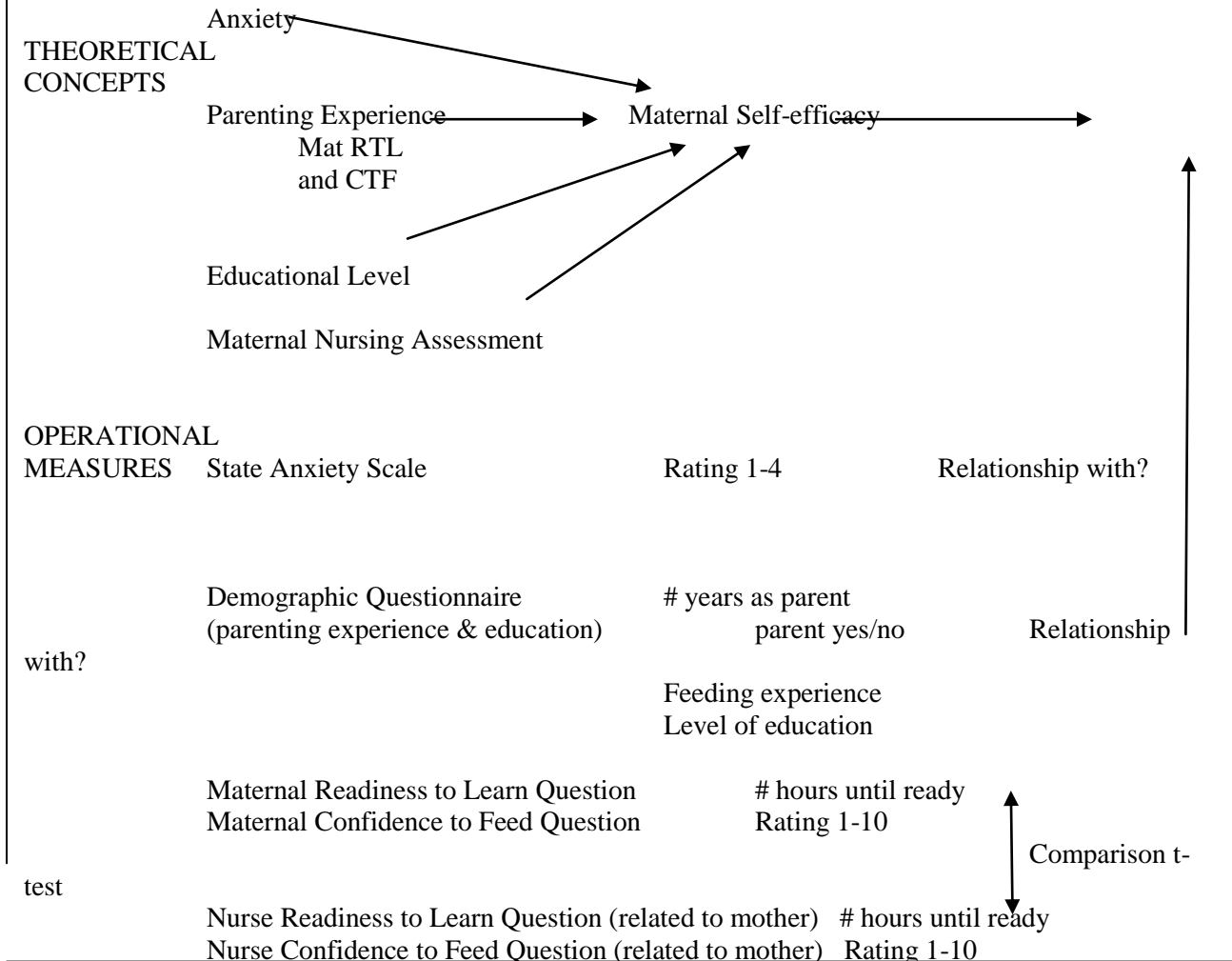
patients, it was not the mechanical complexities of operating a machine or self-administering treatments, but the psychological ramifications of the responsibility that were the priorities when describing their challenges. Psychosocial factors impacted the ability to learn and maintain adequate application at home.

These studies support those in previous sections, in that they illustrate the strong impact of the psychological component of illness. They also introduce the idea of the teachable moment, to which nurses need to be attuned. In order to be aware of this opportunity, nurses need to perform a thorough physical and psychological assessment.

Substruction

Figure 1 illustrates the substruction which links the theoretical frameworks to the operational means by which the research questions were tested. Anxiety, parenting experience, educational level, and the level of maternal nursing assessment were operationalized via measurements. Nurse-patient dyads were compared with respect to perceptions of RTL and CTF, and anxiety, parenting experience, and educational level were measured in terms of strength of relationship with maternal RTL and CTF.

Figure 1. Substruction of theoretical concepts & operational measures for study of Readiness to Learn about Infant Feeding in Mothers of NICU Infants



Conclusion

The postpartum patient who’s infant is in the NICU deals with emotional and physical stressors. The postpartum nurse plays a supportive role within the nurse-patient relationship. Part of this role is performing a maternal assessment of psychological and physical readiness to learn. Learning empowers the mother who is otherwise virtually helpless to control the direct

care and nurturing of her child while that child is physically unstable. NICU nurses also provide teaching to the new parents related to the infant, but it is within the unique relationship between the postpartum mother and her postpartum nurse where teaching opportunities exist early in the postpartum recovery period. Teaching and learning provides stability and empowerment to encourage the mother while she feels vulnerable. Nurses need to avoid making assumptions based on the stressful situation and, rather, be aware of readiness cues from the mother. The timing of teaching about infant feeding should be customized to each patient. Learning about infant feeding content and skills is a way to connect with the infant through the provision of life-sustaining nutrition.

There still exist gaps in knowledge related to perceptions of readiness to learn in mothers of NICU infants. Using existing theory as a framework, the research and the research questions helped to bridge these gaps in knowledge. Both Bandura and Garrison discuss effective learners. Bandura posits that effective learners make effective parents, mediated by self-efficacy. Garrison posits that learners learn within an environment but that environmental factors are secondary to the motivation of the learner; learners with motivation are more effective learners. Bandura and Garrison state that learners must be active learners, participating, communicating, and working with the teacher to create a customized teaching plan. Needs, emotions, and opinions must be made transparent and assessments must be thorough. In combination, the two theories span the learning spectrum from motivation to learn to positive application of new skills.

Missing is research related to the timing of readiness. We know that mothers may be motivated to learn, but when are they ready to learn and is the nurse astute about that readiness, and what is the optimal timing to provide them with new knowledge? This research, which focused on timing formed the basis for future research which can focus on optimal timing. We

know that a relationship and rapport are established between the new mother and her postpartum nurse, but we do not know whether learning needs are actually communicated by the patient or perceived as such by her nurse. This research addressed these questions by determining the timing of maternal readiness to learn about infant feeding, the timing of the assigned nurse's perception of the timing of maternal readiness, and whether there was a significant difference between the two. We know that stressful situations will likely increase the level of state anxiety but we do not know whether an increase in this transitory anxiety affects the timing of readiness to learn. This research addressed the relationship between state anxiety and readiness to learn, in order to determine if there was a significant relationship between the two. We know that previous experience and education tend to increase the confidence and competence of learners, but we do not know if these factors make learners ready to embrace new knowledge more quickly. This research addressed maternal parenting experience and education to determine if there was a significant relationship between these factors and readiness to learn.

Chapter 3: Methods

Introduction

The researcher will describe the purpose and research questions of the study. The design, including the setting, sample, and inclusion/exclusion criteria, will be described. The researcher will provide a detailed description of procedures and data collection methods. The research measurement tools, including the RTL and CTF questions, as well as the state anxiety measurement and demographic questionnaires, will be described. The researcher will provide information about data management and security. Completed data analysis related to each research question will be provided. Lastly, the researcher will discuss ethical considerations.

Purpose and Research Questions

The purpose of the study was to 1) investigate the timing of maternal perceptions of readiness to learn about infant feeding within the postpartum environment, 2) compare maternal perceptions of readiness to learn with nurse perceptions of maternal readiness to learn within the postpartum environment, and 3) investigate variables which may influence maternal perceptions of readiness to learn. The research questions were:

1. When do new mothers perceive that they are ready to learn about infant feeding?
2. When do the nurses assigned to these mothers perceive that the mothers are ready to learn about infant feeding?
3. Are there differences in perception of timing of readiness to learn in the nurse-patient dyad?
4. How confident are new mothers about their ability to feed their infants?
5. How confident are the nurses assigned to these mothers about the mothers' ability to feed their infants?

6. Are there differences in the perception of confidence to feed in the nurse-patient dyad?
7. What is the relationship of level of state anxiety to mother's perception of readiness to learn?
8. What is the relationship of level of parenting experience to mother's perception of readiness to learn?
9. What is the relationship of level of maternal education to mother's perception of readiness to learn?
10. What is the relationship of maternal confidence in her ability to manage infant feeding and mother's readiness to learn?

Design

This was a descriptive, comparative, multiphase study which focused on mothers of NICU infants and their nurses' perceptions of readiness to learn about infant feeding. Each mother completed a demographic questionnaire, an anxiety questionnaire, and questions about the timing of readiness to learn and confidence to feed the infant. Demographic data, previous parenting experience, and level of education were collected. Each nurse, caring for the mother, answered a demographic questionnaire and similar questions about the timing of readiness and confidence to feed the infant, worded appropriately for the nurse to assess the perceptions of the mother. This was facilitated in real-time, shortly after admission to the unit providing postpartum care. Mothers completed the State-Trait Anxiety Inventory (state version) (Spielberger, 1983) as well as chose a response to the question, "When do you think you will be ready to learn about feeding your baby (in hours)?" Mothers rated their level of confidence about infant feeding. Responses to these questions from the two groups were compared. There was a lack of previous research to provide a design framework for this study; however, the study was guided by theory. Bandura's Parental Self-efficacy Theory (1997) postulates that confident

people make competent parents. Garrison's Self-directed Learning Theory (1997) suggests that mastery of a topic helps the learner to feel more confident. These theories, in combination, informed the current research, which was intended to investigate if emotional and physical state, previous experience and maternal education affect readiness to learn in the postpartum population, as well as compare perceptions of timing of readiness to learn between mothers and their nurses.

Study Setting

This study took place in the antepartum and mother-baby units of a 650-bed regional medical, teaching and level II trauma center in Southeastern North Carolina. Although not a traditional postpartum environment, mothers with high-risk pregnancies are cared for during pregnancy and returned to one of two units after delivery in order to provide continuity of care with their nurses and return them to a familiar environment. Mothers on the antepartum unit received basic postpartum care and education, identical to that provided in the postpartum unit. The antepartum and mother-baby units were chosen because they regularly housed mothers of NICU infants who are facing not only the illness of a child, but sometimes maternal illness as well. This hospital has approximately 3000 deliveries per year and 14% of these infants are admitted to the NICU (420 infants/year or 35/month). Approximately 50% of NICU mothers are re-admitted to the antepartum unit after delivery. The other 50% recover on the mother-baby unit because they have no previous history with the antepartum unit. The antepartum and mother-baby units were chosen because the issues that pregnant and postpartum patients face, such as physical complications, emotional stress, and previous rapport with nursing staff, were most aligned with the purpose, aims, and research questions of the study. It was anticipated that there would be 3-4 NICU mothers admitted weekly to these units. The antepartum unit has approximately 15

Registered Nurses who care for high-risk, pregnant women as well as postpartum patients who are returned to the antepartum unit for their recovery. The mother-baby unit has approximately 30 Registered Nurses who work with postpartum patients who have delivered healthy as well as ill newborns.

Sample

A convenience sample of newly delivered mothers and their postpartum registered nurses participated in the study. Mothers were invited to participate during their stay on the antepartum unit before their delivery. Demographic information was collected at that time. Survey data were collected after the mothers delivered their infants and were readmitted to the antepartum unit or admitted to the mother-baby unit. Their transfer from labor and delivery occurred at approximately the 2-hour point after delivery. Power for this study was based on a test of the primary outcome, timing of readiness to learn, using a paired-samples *t* test for mean difference in timing of readiness to learn within matched mother-nurse pairs. Assuming a conservative correlation between the timing of matched mothers and nurses of $r = .2$, a two-sided test at the 5% level of significance was sufficiently powered (90%) to detect a mean difference equivalent to 1 standard deviation with 20 mother-nurse pairs. Because there were approximately 10-15 mothers per month receiving postpartum care who had infants admitted to the NICU, and assuming a post-delivery attrition rate of at least 40% based on physical or emotional issues associated with labor, delivery, recovery, and having an unstable infant (O'Brien, Moritz, Luckey, McClatchey, Ingoldsby & Olds, 2012) it was anticipated that enrollment and data collection duration would be three to five months. As the study hospital is a regional trauma and referral center, the sample was heterogeneous with regard to age, ethnicity, education level, health status, and employment status.

It was anticipated that all antepartum and mother-baby nurses would be involved in the care of a NICU mother at least once during the data collection period. All nurses were invited to participate and for those who agreed, some would participate in collecting readiness to learn, confidence to feed, and state anxiety data more than once during the study.

Inclusion and Exclusion Sampling Criteria

Maternal Participants. Participants were at least 18 years of age. Participants who delivered a living child via any mode of delivery and infant gestation were eligible to participate.

Primiparous and multiparous women were included. Participants spoke English and possessed an elementary school reading level, as the STAI is written at the 6th grade reading level. Ability to read was assessed during the screening and recruitment process when potential participants were asked to read and complete demographic questionnaires and consent forms of similar reading level. The investigator asked potential participants if they could read and if they needed assistance with reading. If the participants could not read or needed assistance with reading, they were excluded from the study. The rationale for this exclusion was based on the fact that confidentiality of maternal responses had the potential to be compromised if the nurse was present and interacting with the mother while the mother answered the questions. Additionally, even if a family member or other visitor was available to read the questions to the participants after delivery, this would not align with the goal of privacy and confidentiality of responses. Mothers were screened and invited to participate prior to the birth of their infants. Subsequently, all consenting mothers whose infants were admitted to the NICU and who were admitted to the antepartum or mother-baby units for their postpartum care were eligible to participate in the study. All mothers met the physiologic parameters of stable vital signs, low-moderate bleeding, firm fundus, and low-moderate pain levels at the time of survey completion. Infants with any

type of health problem were included as this would be expected in a NICU environment.

Mothers who reported having a mental health disorder, such as anxiety or depression, for which they were prescribed psychiatric medication within one year prior to the study, were excluded.

Nurse Participants. All nurses employed in the Women's and Children's Division were Registered Nurses. Nurses on the day and night shift were eligible to participate in the study (all nurses work 12-hour shifts). Nurses had to have been assigned to a patient whose infant was admitted to the NICU. Nurses must have spoken English. Some nurses had more than one patient who met the inclusion criteria over the duration of data collection.

Recruitment and Enrollment Procedures

Approval for the study was obtained from the study hospital's IRB committee prior to any recruitment proceedings. The University of Kansas Medical Center's IRB ceded project oversight to the study hospital. Therefore, although two consents were prepared (Appendixes K and L), participants only needed to sign the consent for New Hanover Regional Medical Center. Pregnant women admitted to the antepartum unit of the study hospital were interviewed and invited to participate in the study by the doctoral candidate (here after referred to as the investigator). New mothers who received postpartum care, and were not pre-screened prior to delivery, were also eligible to participate because the investigator had the same access to screen, interview, and consent in the postpartum unit as was done in the antepartum unit. The investigator made every effort to include these unplanned admissions as time permitted. The investigator communicated regularly by phone with labor and delivery, antepartum and postpartum staff to determine if there had been any new pregnant or delivered patients. Only the number of new patients, not their names, were communicated via telephone. The investigator was present on the various units for several days per week, typically during the day shift on

various weekdays and weekend days, as needed, in order to recruit, consent, and facilitate demographic data collection with maternal participants, answer maternal and nurse participant questions, restock materials and collect completed measurements. All pregnant women ≥ 28 weeks gestation on antepartum were screened for inclusion. Admission to antepartum was not a guarantee that infants would require admission to the NICU, but it was anticipated that a large percentage of these mothers would deliver infants requiring NICU level of care (Burstyn, 2010). Before each new recruitment interview, the investigator reviewed new patients with the charge nurse and those with a high likelihood of delivering an infant needing a NICU level of care were interviewed. All patients meeting enrollment criteria and who were at least 28 weeks pregnant were screened, recruited, and consented (Appendix H). This gestational age was chosen because, in order to achieve a mother-nurse dyad completion rate of approximately 20, and because approximately 3-4 mothers delivered infants requiring NICU care weekly, the data collection period was estimated to last approximately 3-5 months, including attrition of some participants due to illness, fetal demise, or lack of interest. This timeframe allowed mothers who were consented 12 weeks prior to full term to be included near the end of the data collection period. Pregnant patients had varying lengths of stay. Participants completed a demographic form including level of education and previous parenting experience at this time. The investigator explained that although postpartum events could not be fully predicted, participation was expected to occur in real-time, despite current level of infant health.

The investigator participated in two preparatory meetings with administration, IRB coordinators, nurse managers, and nurse educators during the proposal development period. These meetings served to explain the study and data collection procedures to administration and management and to discuss the work flow involved in the project. Nurses were invited to

participate after the investigator presented a training session on the study procedures, which occurred after Human Subjects and Internal Review Board approvals, and just prior to data collection. Nurses were consented individually in order to avoid influence in a group setting (Appendix I). Nurses were each provided a summary document to which they could refer when presenting the survey to patients (Appendix J). The document listed the expectations of data collection, such as maintaining patient privacy, confidentiality of patient and nurse responses and reviewing information about the surveys.

Data Collection Instruments

Demographic Information. After nurses were consented and trained, they completed a demographic form, asking them information about age, previous nursing experience, and education (Appendix B). Some nurses chose to complete these forms during the training session, and others completed and returned forms to a designated locked drop box. During the initial interview, patients completed a form (Appendix A) which asked them about age, parity, number of living children, ethnicity, race, marital status, income, previous breast- or bottle-feeding experience, previous parenting experience and previous education. In order to adequately screen for mental health disorder history, potential participants were asked if they had been prescribed medication or received regular talk therapy for anxiety, depression, or other major mental health disorders in the past 12 months. Data related to parenting experience were collected on several levels: previous experience (Yes/No), number of living children, and type of experience (with categorical options of no previous experience, parenting from birth experience(s), parenting from adoption at birth, or parenting from adoption at an age older than birth (Fenwick, Barclay, & Schmied, 2008; Smit, 2002; Van Ijzendoorn, Euser, Prinzie, Juffer, & Bakermans-Kranenburg, 2009)). Data related to educational level were collected based on several categorical response

options, i.e. less than high school education, high school graduate, college graduate, and graduate school education.

State Anxiety. The State-Trait Anxiety Inventory (STAI) is composed of State Anxiety and Trait Anxiety scales, each 20 questions in length (Spielberger, 1983) (Appendix C). The trait anxiety scale was not used in this study because it is a measure of ongoing anxiety, which was not the focus of the research, and which was an exclusion characteristic. The State Anxiety Scale (STAI Form Y-1) is composed of short statements, i.e., “I am tense”, to which participants respond by circling one of four options: Not At All, Somewhat, Moderately So, and Very Much So. This scale is designed to measure one’s perception of the intensity of their feelings right now (STAI manual, p. 12). Participants blackened the response option to the right of each statement. There is no time limit for completion, however average total response time is 10 minutes. Each response was assigned a number 1-4, respectively. Scoring was summative and based on weights assigned to each response. In question 1, for example, a response of “1” was given a weight of “4”, while a response of “4” was given a weight of “1”. A weighted rating of 4 indicated a high level of anxiety for ten of the questions. Weighted ratings match the response options, 1-4, on anxiety-present items while they are in reverse order for anxiety-absent items, as in question 1. The investigator added the weighted scores for the 20 items. Scores can range from 20-80; the higher the score, the higher the level of state anxiety. One or two responses may be omitted without compromising validity and there is a special scoring procedure for missing responses. Omitting three responses calls into question the level of validity (STAI manual, p. 13); therefore, only questionnaires with 18-20 responses were included in statistical analysis.

Normative data for the State Anxiety Scale (Form Y) are available for high school students, college students, military recruits, and working adults. Form Y norms were based on 1,838

employees of the Federal Aviation Association, the majority of whom were male, white-collar workers. The sample was heterogeneous with regard to education, age, and position. Normative samples for college students, high school students, and military recruits were based on 855, 424, and 1701 subjects, respectively. It is assumed that a small subsample of each normative data group was either pregnant or had recently delivered a child during data collection, as pregnancy was not an exclusion. Additionally, the STAI state form has been used with the pregnant and postpartum populations as a way to measure emotional distress related to fear and trauma during pregnancy and childbirth (Adams et al, 2012; Alder et al, 2011; Hillerer et al, 2011). It was anticipated that current participants would be heterogeneous with regard to age group and would be representative of all of these categories.

Mean total state anxiety scores for all participants ranged from 35.2 – 47.01 with an alpha coefficient range of .86 - .95 (all alpha coefficients were .91 or higher with the exception of male high school students). Mean state anxiety scores tended to be higher when the timing of the test was concurrent to a highly stressful situation, such as prior to rigorous military training or surgery (STAI manual, p. 14). It should be noted that the current Form Y is a revised version from Form X, with revised questions comprising 30% of the scale. Correlations between the two versions ranged from .96 - .98. Mean alpha coefficients rose from .89 to .92 with the revision. As expected, test-retest reliability was low for state anxiety as this is a measure of transient, situational anxiety. The mean retest reliability coefficient was .33, normed on high school students at 30- and 60-day intervals (STAI manual, p. 30). Measures of internal consistency were, therefore, a more meaningful indicator of reliability of state anxiety than test-retest coefficients (STAI, p. 32).

Construct validity was evident in the mean scores between military recruits (stressful environment) and working adults, high school and college students (less stressful environment), with recruits scoring 6-10 points higher than the other groups. Additionally, scores rose approximately 15 points for college students when they were measured in non-test and test situations (STAI manual, p. 44). In order to measure convergent and divergent validity, the STAI was compared to several other inventories which measure anxiety exclusively or as part of a larger personality inventory. State anxiety correlations with the MMPI ranged from $-.64$ - $.79$ and from $-.46$ - $.48$. The first scores were reflective of a more acutely disturbed group of patients. Additionally, correlations between the STAI and the Cornell Medical Index were $.70$ for both state and trait anxiety, indicating that patients with more medical symptoms tend to score higher in anxiety (STAI manual, p. 36).

In the present study, reliability of the STAI was determined using Cronbach's alpha, a measure of internal consistency that measures the degree to which any one item of a measure was a good indicator of performance on any other item in the measure (Waltz, Strickland, & Lenz, 2010). As previously mentioned, internal consistency is a better predictor of reliability related to state anxiety than test-retest reliability scores, because of the transient nature of state anxiety. An alpha score of at least $.70$ was to be considered acceptable (Nunnally, 1978). As participant total scores were based on weighted scores for each of the 20 items, alpha was determined based on these weighted scores. The alpha for this particular study was $.952$.

Readiness to Learn Question. Timing of maternal readiness was measured with one question, created by the investigator, which asked the new mother and the nurse when the mother is ready to learn about infant feeding (Appendices D and E). Wording varied depending on the participant, i.e. "When do you think you will be ready to learn about feeding your baby (in

hours)?” or “When do you think the mother will be ready to learn about feeding her baby (in hours)?” If the mother was ready now, participants were asked to write “0”. Responses were based on an integer ratio scale. There were no previous studies measuring timing of readiness to learn in the postpartum population; therefore, there was no previous evidence upon which to base the creation of the question. This type of measurement level was chosen because a question requiring this type of numeric response had the potential to generate richer data than that with equitable categorical-type responses. In order to monitor distribution and response times, the question response sheet requested participants to write the day/time of delivery and the current time. It also asked mothers to note the type of delivery, either “vaginal” or “cesarean (c-section)”. Nurses answered the same question based on their perception of when the mother was ready to learn.

It was not possible to assess internal consistency of this one-item question for either maternal or nurse response. Test-retest reliability would not be practical or appropriate at this time due to the brief maternal hospital admission time which limited accessibility. However, since this was a newly-created question, it was appropriate and necessary to first pilot the question, which was done with the first 5 maternal-nurse dyads. This was accomplished by asking these dyads about their perceptions of the accuracy, acceptance and relevance of the question (Thomas, Hathaway, & Arheart, 1992). The analysis of these responses was intended to determine whether the item reasonably measured the construct of readiness to learn timing. Redshaw (2008) discussed how the qualitative approach of asking for feedback and listening to participants within the field of maternity care can provide a rich contextual augmentation to the development of new measurement questions which would have otherwise been created simply from an analysis of the literature.

Confidence to Feed Infant Question. Mothers were asked to rate themselves on their level of confidence about infant feeding management. Similarly, the nurse rated her confidence in the mother to manage infant feeding. Wording was specific to the participant. Mothers were asked to rate themselves based on the statement, “I will be able to manage the feeding of my baby” (Parent Expectations Survey (PES), Question #1) (Reece, 1992) (Appendix D). Nurses were asked to rate the mother, given the statement, “Your patient will be able to manage the feeding of her baby” (Appendix E). The latter statement, written by the investigator, was an adaptation from of the PES. Response options included a 0-10 rating scale with descriptive categories of “cannot do”, “moderately certain can do”, and “certain can do” which are listed over the lower numbers, medium numbers, and higher numbers of the rating scale, respectively. The higher the rating, the more confident the mother feels. The Parent Expectations Survey is a measure of perceived self-efficacy in early parenting (Reece, p. 336) and is designed to rate confidence in everyday parenting tasks, which aligns with the current study’s theoretical frameworks of self-efficacy and self-directed learning. The full scale includes 20 statements to be rated, beginning with “I can”, and is scored by dividing the total score by 20. The measure provides an additional level of understanding of why maternal and nurse participants rate the timing of readiness to learn about infant feeding as they do. The measure is appropriate for clinical settings, has good content, convergent, discriminant, and predictive validity, and good internal consistency and test-retest reliability (Reece, p. 342-343). Additionally, it is a parenting scale which aligns with Bandura’s criteria for scale construction (Reece, p. 338-339).

As with the readiness to learn question, it was not possible to assess internal consistency of this one-item question for maternal or nurse response. Test-retest reliability was not practical or appropriate. However, since this was a newly-created question from the nurse perspective, and

because only one question from the scale was being used for mothers and nurses, it was necessary to pilot the question, which was done with the first 5 maternal-nurse dyads. This was again accomplished by asking these dyads about their perceptions of the accuracy, acceptance and relevance of the question. The analysis of these responses was intended to determine whether the item reasonably measured the construct of confidence to manage the feeding of the infant.

Data Collection Procedures

Phase 1

A pilot of the readiness to learn measure, the confidence to feed measure and the study protocol helped to support the questions as they were written, or the need for modification, and identified any potential issues in carrying out the protocol. Face validity is the appearance of the instrument, to a layman, to measure what the test constructor claims it measures (Waltz, Strickland & Lenz, 2005, p. 156). Therefore, the first five maternal participants were asked how well the question measured their beliefs about when they were ready to learn, using a Likert scale (Appendix F). Specifically, the investigator asked, “How well did the question, which asked you to write the number of hours until you were ready to learn about infant feeding, measure the timing of your readiness to learn?” Response options included: 1 (not at all), 2 (a little), 3 (moderately), 4 (quite well), or 5 (perfect match). The investigator verbally queried these participants within 24 hours of their completion of the surveys and noted their responses. An average aggregate response of ≥ 3 was considered adequate face validity and the question would remain as is. An average aggregate response of ≤ 2 was considered inadequate face validity, necessitating modification of the question.

Similarly, to assess face validity of the confidence to feed question, the investigator queried mothers 24 hours after the completion of the surveys about how well the question measured their confidence to manage the feeding of their infants (Appendix F). Response options and scoring was identical to those for the readiness to learn face validity question.

To investigate protocol feasibility, the investigator queried the nurses assigned to the first five maternal participants as soon as possible after each nurse completed one round of data collection. If nurses were not physically present on the unit, the investigator contacted the nurse via phone, text, or email within 24 hours of survey completion. These nurses were verbally queried about whether or not they encountered any problems with the general protocol, timing parameters, or understanding of specific responsibilities and these responses were noted by the investigator (Appendix G). The nurse responded either “Yes” or “No” next to each of three statements and one point was assigned to each type of identified problem by the investigator; so, for example, if one nurse stated that there were issues in all three categories, this nurse’s responses would be assigned three points. An average aggregate total of ≤ 2 points in each category was equated with an adequate level of feasibility for that parameter of the protocol. Any of the three areas which achieved a score of ≥ 3 points required modification.

After nurses were consented and trained, they completed a demographic form. A majority of forms were collected at the conclusion of training or at a later date via a locked drop box. The training session occurred during two regular staff meetings so that nurses who worked different shifts could be present. Training consisted of a brief overview and a question and answer session. For those nurses not in attendance, they were individually contacted by the investigator, provided copies of the training documents, asked if they had any questions, consented, and asked to complete and return the demographic form to a locked drop box. Staff assignments were

determined based on participation; only participating nurses were assigned to NICU mothers. This assignment pattern applied to the admitting nurse who was receiving the patient from labor and delivery.

There was an unanticipated change in bed flow patterns just prior to data collection, necessitating that delivered mothers be admitted to either antepartum or postpartum. The first five of these mothers who were identified as having an infant in the NICU were assigned to participating nurses. This nursing assignment plan was discussed with the nurse manager in advance and communicated during the training session (which included charge nurses who were responsible for making assignments). The original maternal consents collected at study invitation were kept by the investigator. A copy of the consent was given to the participant as well as placed in the medical record, per hospital protocol. The electronic medical record was originally to be flagged with a colored sticker, alerting staff that the patient was a study participant, but technical issues prevented this from happening. As an alternative, the investigator placed a sticker, entitled, "Research Participant", on each mother's chart. Mothers were originally to be given a copy of the S-Anxiety Scale (STAI Form Y-1), the timing of readiness to learn question, and the confidence to feed question by the nurse assigned to their care during the early postpartum nursing assessment and recovery period. Field observation prior to the start of data collection by the co-investigator revealed that the initial nursing assessment was typically completed within 60 minutes after transfer from the labor and delivery unit. After the assessment was completed and the nurse was confident that the mother was in stable health (stable vital signs or not WNL but asymptomatic, mild to moderate vaginal bleeding, firm fundus, pain level \leq 5/10 on pain rating scale, and stable emotional state) (Leduc et al, 2009), the nurse advised the investigator, who distributed the STAI, timing, and confidence

questionnaires to the patient/participant and left the room. It was initially anticipated that data collection would be facilitated within 6 hours after transfer, but it was actually facilitated within 12-24 hours after transfer. The nurse completed separate timing and confidence questions in another location concurrently. Nurses noted their names on the data collection form. A patient label was affixed to all collection forms to keep matched nurse-patient responses together. Mothers and nurses were also asked to note the time of completion of the questionnaires on each as well as a few other questions to elicit descriptive data (Appendices D/E). All mothers completed surveys within 12-24 hours after delivery. Their assigned nurses completed surveys within 1 hour of the mother. Nurses and mothers did not communicate during data collection in order to minimize confounding of either response. Mothers and nurses sealed their respective questionnaires in envelopes and the nurse collected all sealed envelopes and placed these in a locked data collection box, located in the locked staff lounge, by the end of the shift. Responses were collected by the investigator and data analysis was performed to determine face validity of the readiness to learn question, as well as feasibility of the study protocol. Modifications were unnecessary for the research measures. However, due to a bed flow change, an addendum, adding “mother-baby unit”, was filed with the NHRMC IRB committee. The investigator queried the IRB coordinator to determine if an additional amendment should be filed due to the change from nurse to investigator distributing the surveys post-delivery. Because this did not constitute a qualitative change in study protocol, no addendum was deemed necessary by the IRB coordinator for that change. No data collection occurred during the resubmission process.

Phase 2

Phase 2, the official or definitive part of the study, began after the addition of the postpartum/mother-baby unit addendum was approved. The protocol in Phase 2 was the same as that in Phase 1 with the exception of the number of participating mother-nurse dyads and survey distribution. Due to a pattern of non-compliance with survey distribution by nurses, the investigator distributed surveys directly to mothers and nurses within 12-24 hours of each participant delivery. Distribution did not occur within the first 6 postpartum hours as planned. In Phase 2, recruitment, screening, consenting, and data collection continued until the intended sample size of 20 dyads was obtained.

Data Management

All measurement tools were labeled with a standard patient label in order to insure accurate patient-nurse response matching. Labels were removed and destroyed after patient names were assigned a participant number on a master list and prior to original documents leaving the hospital unit. All responses were sealed in an envelope provided by the investigator. The investigator had sole access to the locked data collection box and collected all responses within it. Response envelopes were opened and data were entered in a secure location, separate from the postpartum area. The investigator had sole access to any computer files and statistical software. All electronic data were housed in a secure file, which was password-protected and accessible only to the investigator. SPSS version 17 was the statistical software used for data entry and analysis.

Data Cleaning

Participant demographic information and outcome data were reviewed prior to data analysis for that which did not meet inclusion criteria, such as incomplete surveys or having a positive psychiatric history. All entered data were verified by a second person for accuracy.

Data Analysis

Data cleaning was performed prior to data analysis by correcting typographical errors and removing data obtained from responses meeting exclusion criteria, such as an STAI response sheet with two or more missing responses. All data entered into SPSS were checked by a second person for accuracy.

Research Question #1: When do new mothers perceive that they are ready to learn about infant feeding?

Data related to the timing of readiness to learn were collected from mothers based on an integer ratio-level of measurement scale. Descriptive statistics were used to provide information on timing of RTL. If timing of readiness had an approximately symmetric distribution among respondents, means and 95% confidence intervals were reported. If skewness was present, medians and interquartile ranges were substituted.

Research Question #2: When do the nurses assigned to these mothers perceive that the mothers are ready to learn about infant feeding?

Data related to the timing of readiness to learn were collected from nurses based on an integer ratio-level of measurement scale. Descriptive statistics were used to provide information on timing of RTL. If timing of readiness had an approximately symmetric distribution among respondents, means and 95% confidence intervals were reported. If skewness was present, medians and interquartile ranges were substituted.

Depending on primary analysis outcomes, additional and secondary data analysis was planned to determine if there were factors influencing the nurse's perception of RTL. If the data were non-normal, a non-parametric, two independent samples t-test would be appropriate. Because RN RTL was a continuous, outcome variable, and was being compared by categorical variables (maternal race, maternal education, marital status, income, parenting experience, pumping, NICU experience, and RN education), a Mann-Whitney test was planned to determine if there was a difference in values when compared by these variables.

Research Question #3: Are there differences in perception of timing of readiness to learn in the nurse-patient dyad?

Matched data collected from mother-nurse dyads from the question about timing of readiness to learn was tested using a two-tailed paired t-test to compare the mean difference in matched pairs. The two-tailed test is used when the direction of the correlation is not known. If skewness was observed, the nonparametric equivalent was substituted. In addition, the mean and 95% confidence interval were reported for the matched differences.

Research Question #4: How confident are new mothers about their ability to feed their infants?

Data related to the level of confidence to feed the infant were collected, based on interval-level response options. If confidence had an approximately symmetric distribution among respondents, means and 95% confidence intervals were reported. If skewness was present, medians and interquartile ranges were substituted. If the data were non-normal, a non-parametric, two independent samples t-test would be appropriate. Because maternal CTF was a continuous, outcome variable, and was being examined by categorical variables (maternal race, marital status, income, parenting experience, pumping, NICU experience, and RN education), a Mann-Whitney test was planned.

Research Question #5: How confident are the nurses assigned to these mothers about the mothers' ability to feed their infants?

Data related to the nurse's confidence that the mother could manage the feeding of her infant were collected, based on interval response options. If confidence had an approximately symmetric distribution among respondents, means and 95% confidence intervals were reported. If skewness was present, medians and interquartile ranges were substituted.

Secondary data analysis was planned to determine if there were factors influencing the nurse's perception of CTF. If the data were non-normal, a non-parametric, two independent samples t-test would be appropriate. Because nurse CTF was a continuous, outcome variable, and was being compared by categorical variables (maternal race, marital status, income, parenting experience, pumping, NICU experience, and RN education), a Mann-Whitney test with exact significance (2-tailed) was planned.

Research Question #6: Are there differences in the perception of confidence in the nurse-patient dyad?

Matched data collected from mother-nurse dyads from the question about confidence to feed the infant were tested using a two-tailed paired t-test to compare the mean difference in matched pairs. The two-tailed test is used when the direction of the correlation is not known. If skewness was observed, the nonparametric equivalent was substituted. In addition, the mean and 95% confidence interval were reported for the matched differences. If there was variation in responses within maternal and nurse ratings of CTF, a paired samples t-test would be appropriate.

Research Question #7: What is the relationship of level of state anxiety to mother's perception of readiness to learn?

Responses to the STAI produced interval-level data. Higher scores on the STAI represented higher levels of state anxiety. If anxiety had an approximately symmetric distribution among respondents, means and 95% confidence intervals were reported. If skewness was present, medians and interquartile ranges were substituted. Pearson's correlation coefficient was used to determine the strength of linear dependence between level of state anxiety and the mothers' timing of readiness responses. Following the primary analysis, secondary analysis was planned to determine if state anxiety was correlated to other continuous variables (RN CTF, RN RTL, RN Age, RN experience and OB experience, maternal age, number breast- and bottle-fed, and number of living children) using Pearson's method in order to test for possible significant linear associations.

Research Question #8: What is the relationship of level of parenting experience to mother's perception of readiness to learn?

Maternal participants were asked 3 questions regarding level of parenting experience. Question #1 asked the mother to select between having parenting experience or not having parenting experience, a nominal-level measurement. Question #2 asked participants to select a category which best represented their level of parenting experience, an ordinal-level measurement. Question #3 asked for number of living children and was an integer ratio-level measurement. Descriptive statistics were first used for each of these questions: 1) frequency and relative frequency (proportions) were determined for the categorical responses in questions 1 and 2; and 2) mean and standard deviation were reported for question 3. Because the continuous timing for readiness to learn outcome was correlated with different levels of data on parenting experience, appropriate correlational analysis was used. For the nominal level parenting experience outcome in question 1, a *t* test was planned in order to determine whether statistically

significant differences in timing of readiness existed between subjects with and without parenting experience. If the sample contained an imbalance of mothers with one level of experience, a nonparametric test was planned in place of the t test. Spearman's Rank correlation was planned to analyze the association between the ordinal parenting experience outcome in question 2 and timing of readiness. Pearson's correlation was planned to analyze the association between timing of readiness and the continuous parenting experience outcome from question 3. Following the primary analysis, secondary analysis was planned to compare number of living children by other categorical variables. An independent samples t test was planned to compare number of living children by the categorical variables of maternal race, marital status, income, parenting experience, pumping, NICU experience, and maternal and RN education (based on a normal distribution and equal or unequal variances). Although parenting experience was not an outcome variable, it was one of several variables hypothesized to influence maternal RTL and was explored to determine if it had a relationship with other variables. A chi square test was used to determine if there was a relationship between parenting experience and the categorical variables of race, marital status, income, maternal education, pumping, NICU experience, and RN education. A two-tailed Fisher's Exact test, which is a more precise result of the chi square, was planned due to having a small sample size.

Research Question #9: What is the relationship of level of maternal education to mother's perception of readiness to learn?

Descriptive statistics were conducted, including frequencies and relative proportions. The association between this ordinal outcome and timing of readiness was analyzed using Spearman's Rank correlation because the measurement levels were heterogeneous.

Research Question #10: What is the relationship of maternal confidence in her ability to manage infant feeding and mother's readiness to learn?

A multiple regression was planned to determine if maternal self-efficacy (operationalized as confidence to feed the infant) mediated the relationship between the independent variables of anxiety, parenting experience, education, and level of nursing assessment expertise/astuteness and the dependent variable of maternal readiness to learn. Multiple regression is appropriate when there is more than one dependent variable; in this case, the added dependent variable was maternal self-efficacy. Multiple regression is also appropriate when there is analysis of both categorical and continuous variables, i.e. parenting experience yes/no vs. number of years of parenting experience.

Ethical Considerations

Approval for the study was obtained from the University of Kansas Medical Center Human Subjects Committee and the study hospital's IRB committee prior to any recruitment proceedings. The university ceded IRB oversight to the study hospital's IRB (Appendix M). Additionally, since changes to the study protocol and consents needed to be made following Phase I of the study, to include the mother-baby unit, an amendment was filed with and approved by the study hospital's IRB (Appendix N) and no study activities were performed during the amendment approval process.

As a University of Kansas student, the co-investigator was current on Human Subjects' Protection and HIPAA regulations, via the completion of annual tutorials. These tutorials reviewed the importance of confidentiality and informed consent. No monetary incentive was offered to maternal or nurse participants nor was any monetary payment taken by the investigator during the course of the study. All participants were given a description of the research both

verbally and in writing prior to obtaining their consent. Participants were informed that there were no known risks involved in their participation, except the inconvenience of completing the questionnaires. Mothers were informed that responses to the questions would have no bearing on the level of hospital care they received. Nurses were informed that their responses to the questionnaires would have no bearing on job performance evaluations. Although there were no direct or immediate benefits, participants were informed of the potential benefit to increase knowledge in the area of maternal readiness to learn and nurses' perceptions of their patients readiness to learn about infant feeding.

Considering the stressful situation that NICU mothers endured, the chosen measurements were brief and could be completed in 10-15 minutes. Although these participants were asked to complete 22 questions (20 from the STAI, 1 timing question, and 1 confidence question), the STAI statements were very brief (4-5 words). Additionally, participants were in a private, low-stimulation hospital room when completing the questionnaire. Data were collected after the postpartum nursing assessment and privacy was insured by secluding patients from visiting family and friends.

The investigator determined if participants had any questions related to the study or completion of the questionnaires. After nurse training, nurses were asked if they had any questions about facilitation of the data collection. Confidentiality was maintained by asking patients and nurses to seal their responses in envelopes immediately after completion.

Individual participant names were assigned a number prior to data entry. No personal identification was recorded. Original documents will be kept only by the investigator for no less than six years, per institutional record-keeping policy.

Summary

This was a descriptive, comparative, multiphase study intended to examine the relationship between variables and readiness to learn as well as compare maternal and nurse perceptions about maternal timing of readiness to learn and confidence to feed the infant.

Applications with the University of Kansas Human Subjects Committee and the New Hanover Regional Medical Center's IRB Committee were submitted prior to the start of data collection. Field observation by and meetings between the co-investigator and administration, management, staff education, and training with staff nurses occurred prior to the start of data collection.

A convenience sample of mothers delivering a child admitted to the NICU during the study period, and their nurses, was used. The study took place in a regional trauma and referral hospital, insuring a diverse sample. Data collection occurred on the antepartum and mother-baby/postpartum units of the women's and children's division in two phases. Phase one included a pilot of the readiness to learn and confidence questions along with the state-trait anxiety inventory. Based on face validity of the readiness to learn question, the confidence to feed question, and the assessment of protocol feasibility, amendments to the study were not necessary. There was an unofficial change to the study protocol for Phase two, when the investigator began distributing surveys directly. Phase two included data collection and procedures based on the analysis and feasibility of phase one. Mothers were individually consented for the study prior to completion of the demographic form, the State Form of the State-Trait Anxiety Inventory and questions related to readiness to learn timing, developed by the co-investigator, and confidence to feed the infant. Nurses were individually consented prior to their participation in the study and completion of the readiness to learn timing question.

Chapter 4: Results

Introduction

The purpose of this study was to investigate the timing of maternal perceptions of readiness to learn and confidence about infant feeding, to compare those perceptions with those of the postpartum nurses assigned to care for these mothers, and to investigate factors which might affect readiness to learn and confidence to feed. The study began with a pilot phase which included the first five maternal-nurse dyads. This phase was intended to determine the face validity of the readiness to learn and confidence to feed questions as well as the feasibility of the study protocol. At the conclusion of the pilot phase, formal data collection began. The results are both descriptive and quantitative, and are organized by research question. Included within each of these summaries is data which were derived from the original research questions as well as any secondary data analyses, intended to investigate factors affecting maternal outcome and relationships between variables.

Pilot Phase

The first five maternal-nurse dyads completed all measurements, including the RTL and CTF questions and the STAI (mothers only). Since this phase was used to ascertain face validity of the RTL and CTF questions and protocol feasibility, the post-pilot survey was given to the ten participants within 24 hours of survey completion. Mothers were comprised of Caucasian (2) and African-American (3) race, ranged from 19–38 years of age (Mean = 25.5; SD = 5.5), completed high school (3) or college (2), had annual household incomes of \$25 - \$50,000, and were married (2) or single (3). Maternal participants all indicated that they were RTL now with a rating of “0” hours and rated their CTF between 6-10 on a scale of 1-10 (10 being the most confident). Maternal anxiety scores ranged from 20-70 on a scale of 20-80 with two scores in the low range, two in the moderate range, and one in the high range. There were three vaginal

and two cesarean deliveries. Four out of five RNs believed their assigned mothers were RTL now and one stated four hours. RN CTF scores ranged from 2-10 with all but one score ranging from 6-10. The five maternal participants rated both questions at ≥ 3 , meaning that the RTL and CTF questions assessed those concepts at the moderate, very well, or perfect match levels. The aggregate score ≥ 3 met the inclusion parameter. These questions were then used in the formal data analysis phase. Likewise, nurses rated the feasibility of the study protocol, answering questions based on general protocol, timing parameters, or understanding of specific responsibilities. Nurse ages ranged from 23-52 (Mean = 39.4; SD = 12.6) with 1-30 years (Mean = 12.4; SD = 12.2) of nursing and obstetrical experience. All nurses worked in the obstetrical specialty for their entire careers. There were 3 nurses with bachelor degrees and 2 nurses with associate degrees. Out of a potential fifteen responses (five nurses answering three questions, each), all but one response indicated no problems with feasibility. There was one rating of “1”, indicating that one nurse felt that the timing of the survey distribution was inappropriate. This nurse happened to be in the midst of completing three patient discharges concurrently with distributing the surveys to a new mother. The total aggregate score of ≤ 3 met the inclusion parameter. The study protocol was implemented in its original state in the formal data analysis phase.

Formal Data Analysis Sample

After the initial 5 mother-nurse dyad samples completed the pilot phase, an additional 20 dyads, including mothers who were enrolled before giving birth, completed the study. Shortly after the initiation of formal data collection, individual survey distribution was delayed due to a lack of nurse adherence to the original protocol, necessitating the principal investigator be present after each delivery in order to distribute surveys directly to maternal and nurse

participants. This protocol change occurred after there was a pattern of eight participants delivering but not receiving surveys. Additionally, seven measurement packets were incomplete when returned by the nurse, rendering all demographic and survey data unusable. Surveys were subsequently distributed, on average, within 12-24 hours of delivery, rather than within 6 hours of delivery. Of the 20 mothers, 17 were surveyed within 10-12 hours of birth. The remaining three mothers were surveyed within 20-24 hours of birth.

Of the 40 recruited mothers, 5 were used for the pilot, 15 were not used (not given surveys by their nurses, no longer met inclusion criteria or refused to complete the surveys), and 20 were surveyed. Of the 25 recruited nurses, seven were assigned to maternal participants once so were surveyed once. Five were assigned to maternal participants twice so were surveyed twice. One was assigned to maternal participants three times so was surveyed three times.

Maternal Participant Demographic Data

Descriptive data were gathered on maternal participants, including socio-demographic data, parenting experience, and clinical information. Participating mothers were comprised of Caucasian (12) and African-American race (8), ranged in age from 18-38 years of age (Mean = 29.5, SD = 7), reported incomes from \$25,000 to \$100,000+ dollars and education completed at the high school (13) and college (7) levels. Ten mothers were married, nine were single, and one was engaged (Table 1). Gestational ages at the time of birth were 34-36 weeks. Because of the high-risk nature of each pregnancy, mothers were induced or delivered operatively during this time frame. The most common attributes were older age, Caucasian, married, with a lower household income and possessing a High School degree.

Thirteen (65%) reported having some level of parenting experience, and all but two of these reported having parented their biological baby from birth (one adopted from birth and one

parented at an age older than birth). Seven (35%) were first-time mothers. Seven of the thirteen experienced mothers (53%) had bottle-fed their infants, four (30%) had breastfed their infants, and one had done both. Five experienced mothers (38%) had pumped their breasts to collect breast milk. Of the thirteen experienced mothers, three (23%) had previously had infants in the NICU (Table 2). All but one sibling was still living and the number of these children ranged from one to three. The most common attributes were parenting experience from birth and bottle-feeding.

Table 1

Maternal Socio-demographic Data (N = 20)

Characteristic	Category	Frequency (%)
Age	18-27	8 (40%)
	28-37	12 (60%)
Race	Caucasian	12 (60%)
	African-American	8 (40%)
Marital Status	Married	10 (50%)
	Engaged	1 (5%)
	Single	9 (45%)
Income	\$25-50,000	12 (60%)
	\$51-100,000	7 (35%)
	over \$100,000	1 (5%)
Education	High School	13 (65%)
	College	7 (35%)

Table 2 *Parenting Experience*

Characteristic	Frequency	Breastfed	Bottle-fed	Pumped	NICU
No Parenting Experience	7	0	0	0	0
Parented Biological Baby from Birth	11	4 (+0.5)	7 (+0.5)	5	3
Adopted Baby from Birth	1	0	1	0	0
Parented Older than Birth	1	0	0	0	0

Participants spent one to eighteen days on the antepartum unit prior to giving birth (Mean = 4.4 days; SD = 4.8 days). Eleven (55%) had vaginal births and nine (45%) had cesarean births. Eighteen (90%) out of 20 subjects had hospital stays between one to nine days prior to giving birth and the remaining two (10%) subjects stayed between ten and eighteen days before delivery. The most common scenario was vaginal birth after a short hospital stay (less than nine days).

Additionally, nurses were asked to provide the maternal diagnosis prior to delivery and the reason for NICU admission (some mothers and infants had multiple problems). Maternal diagnoses, with frequencies, included: premature rupture of membranes (PROM) (10), sexually-transmitted disease(s) (STD) (1), pre-term labor (PTL) (10), multiple gestation (3), pregnancy-induced hypertension (PIH) (2), Type II diabetes (2), tachycardia (2), and limited pre-natal care (PNC) (1). Reasons for NICU admission included: prematurity (10), hemodynamic instability (5), decreased blood glucose (BG) (10), decreased temperature (T) (8), meconium fluid (2), respiratory distress (7), and metabolic instability (liver) (1). The most common maternal problems were PROM and PTL. The most common infant conditions were prematurity and BG.

Nurse Participant Demographic Data

Descriptive data were also gathered on nurse participants. Thirteen of the original 25 nurse recruits were assigned to maternal participants. Some of those nurses participated in the study with more than one maternal participant, thus the demographic data reported here are for 13 nurses. Nurse ages ranged from 23-59 years (Mean = 39.7 years; SD = 11.9 years). Years as a Registered Nurse (Mean = 11.6 years; SD = 10 years) and as an obstetric nurse (Mean = 9.8 years; SD = 9.9 years) ranged from 1-30 years. There was an approximate split between nurses holding bachelor degrees and associate degrees (Table 3).

Table 3

Nurse Socio-demographic Data (N=13)

Characteristic	Category	Frequency/%
Age (Years)	21-40	7 (52%)
	41-59	6 (46%)
Experience as Registered Nurse (Years)	1-15	6 (46%)
	16-30	7 (52%)
Experience as OB Nurse (Years)	1-15	8 (61%)
	16-30	5 (39%)
Education	Associate	6 (46%)
	Bachelor	7 (52%)

To summarize, the most common maternal-nurse scenario was to have a younger, Bachelor's-prepared nurse with less experience caring for an older, Caucasian mother with less education

and a lower income. This mother was recovering from a vaginal delivery after a brief hospital stay, and had previously parented an infant from birth.

Results by Research Question

Research Question #1: When do new mothers perceive that they are ready to learn (RTL) about infant feeding?

All mothers scored their RTL timing as “0”, meaning that they were all ready to learn at the time of the survey (Appendix O). There was an additional, open-ended question paired with this question to provide depth for this quantitative measure as well as to give the participant the opportunity to provide a rationale for her decision. The qualitative question was, “What helped you to make your decision about when you will be ready?” Categories emerged from the raw data such as being proactive, being hands-on, a desire to provide breastmilk, previous experience, being the best mother possible, researching information prior to birth, comfort, doing the best for baby, and providing nutrition. (Appendix P). From these categories, overarching themes emerged which were about being active and providing as healthy a start as possible for their infants.

Research Question #2: When do the nurses assigned to these mothers perceive that the mothers are ready to learn (RTL) about infant feeding?

Nurses reported RTL timing for their assigned mothers between 0 -12 hours. The lower the number of hours, the faster the nurse perceived the mother would be ready. Because six nurse participants cared for more than one maternal participant, results are reported as responses rather than nurse totals. Fifty percent of the nurse responses were “0”, meaning that the mothers were ready to learn now. Another 25% of responses assigned mothers a score of 2-4 hours. The other

25% of responses assigned mothers a score of 6-12 hours (Appendix O). The median (1 hour) and interquartile ranges (4, 5.5 hours) were also determined.

As with the maternal question, there was an additional, open-ended question included for nurses, in order to provide depth and rationale for this quantitative measure. Nurse responses included categories of motivation, activity, experience, support, bonding behaviors, pumping activity, and maturity. From these categories emerged themes of action, experience, and support (Appendix Q).

In secondary analysis, RN RTL was examined by the categorical variables of maternal race, maternal education, marital status, income, parenting experience, pumping, NICU experience, and RN education using a Mann-Whitney test. There was only one statistically significant difference found; values of nurses' perceptions of maternal readiness timing were higher among nurses educated at the associate degree levels (Mean Rank 13.55 for associate degree, 7.55 for bachelor degree; $p = .023$). RN RTL was also examined by other continuous variables using Pearson's method (Mat CTF, RN CTF, RN age, RN general experience, RN OB experience, maternal age, number breastfed, number bottle-fed, and number of living children). There was a statistically significant negative correlation between RN RTL and Maternal CTF ($r = -.475$; $p = .034$); all other correlations were non-significant.

Research Question #3: Are there differences in perception of timing of readiness to learn in the nurse-patient dyad?

Since there was no variation in the maternal RTL responses (the dependent variable), a two-tailed paired t-test was not possible. Differences between all matched responses were calculated (determined by subtracting maternal RTL from nurse RTL responses) and ranged from a minimum of 0 hours to a maximum of 12 hours. Because the maternal RTL responses were all

“0”, the differences in matched responses were equal to the RN RTL responses. The mean difference in RTL was 3.3 hours, 95% CI [1.3, 5.2]; that is, nurses’ perception of their mother’s readiness to learn was, on average, 3.3 hours later than the mothers’ own perception of their readiness.

Research Question #4: How confident are new mothers about their ability to feed (CTF) their infants?

CTF responses among mothers ranged from a minimum of 3 units to a maximum of 10 units on a scale of 1-10. Over 50% of mothers rated themselves as a “10”, or “certain can do” infant feeding. Another 25% rated themselves between 5-9, “moderately certain can do” and “certain can do” (Appendix O). The median (10) and interquartile ranges (6.25, 10) were also determined.

Secondary data analysis was then used to determine if there were factors relating to the mother’s perception of CTF. Maternal CTF was examined by categorical variables (maternal race, marital status, income, parenting experience, pumping, NICU experience, and RN education), using a Mann-Whitney test. There were no statistically significant differences (.05 level). Maternal CTF was also examined in relation to other continuous variables using Pearson’s method (RN RTL, RN CTF, RN age, RN general experience, RN OB experience, maternal age, number breastfed, number bottle-fed, and number of living children). As reported in question #2, maternal CTF was significantly negatively correlated to RN RTL ($r = -.475$; $p = .034$). There were no other significant correlations with the other continuous variables tested.

Research Question #5: How confident are the nurses assigned to these mothers about the mothers’ ability to feed their infants?

CTF responses among nurses ranged from 2 units to 10 units on a scale of 1-10. The higher the rating, the more confident the nurse perceived the mother to be. Again, because six nurses

cared for more than one maternal participant, results are reported as responses rather than nurse totals. Over 50% of nurse responses assigned mothers at the 8, 9, or 10 level. Over 30% of nurse responses rated mothers in the moderately confident range (with scores of 6 or 7) (Appendix O). The median (8) and interquartile ranges (6, 9) were also determined.

Secondary data analysis was then used to determine if there were factors influencing the nurse's perception of CTF. Nurse CTF was compared by categorical variables (maternal race, marital status, income, parenting experience, pumping, NICU experience, and RN education) by using a Mann-Whitney test. Statistically significant differences in nurses' perception of CTF were found when compared by maternal race type (Mean Rank 12.63 for Caucasian, 7.31 for African-American; $p = .047$) and level of maternal education (Mean Rank 8.58 for high school, 14.07 for college; $p = .046$). RN CTF was also examined in relation to other continuous variables using Pearson's method (RN RTL, RN age, RN years as a nurse, RN OB experience, maternal age, number breastfed, number bottle-fed, and number of living children). RN CTF was significantly correlated to RN Age ($r = .497$; $p = .026$) and RN Years as a nurse ($r = .479$; $p = .033$), but not to the other continuous variables.

Research Question #6: Are there differences in the perception of confidence in the nurse-patient dyad?

A paired-samples t-test comparing mean CTF in the nurse-patient dyads was non-significant ($t = 1.363$; $p = .189$). Mean confidence levels and standard deviations of matched-pair maternal (Mean = 8.2 units; SD = 2.4 units) and nurse (Mean = 7.5 units; SD = 2.1 units) CTF scores, mean difference (0.7 units), and 95% CI [-0.03, 0.07] were determined. The perception of confidence among maternal and nurse participants was significantly correlated using Pearson correlation ($r = .483$; $p = .031$).

Research Question #7: What is the relationship of level of state anxiety to mother's perception of readiness to learn?

Maternal anxiety levels ranged from a minimum of 20 to a maximum of 72 within a possible range of 20-80. Scores ≥ 40 on the state version of the STAI are considered positive for anxiety, so a score of 40-60 would be considered a moderate level (Paul, Downs, Schaeffer, Bieler, & Weisman, 2013). Twelve mothers scored below 40 (low) and eight mothers scored between 40-60 (moderate) (Appendix O). Median (32) and interquartile ranges (26, 64) were determined. Cronbach's alpha was calculated to be .95, based on total weighted scores. Because there was no variation in maternal RTL, a correlation between anxiety and RTL could not be performed.

The relationship of state anxiety to other continuous variables (RN CTF, RN RTL, RN Age, RN experience and OB experience, maternal age, number breast- and bottle-fed, and number of living children) was examined using Pearson's correlation method. Anxiety level was significantly negatively correlated with maternal CTF ($r = -.500$; $p = .025$), nurse experience as an R.N. ($r = -.657$; $p = .002$), nurse experience as an obstetrical (OB) R.N. ($r = -.614$; $p = .004$) and RN age ($r = -.738$; $p < .001$).

Research Question #8: What is the relationship of level of parenting experience to mother's perception of readiness to learn?

Frequencies and proportions were determined for questions measuring whether or not the mother had parenting experience and the level of parenting experience. Thirteen mothers (65%) reported having parenting experience. Seven (35%) reported having no experience, 11 of 13 (85%) reported having parented a biological baby from birth, 1 (7.5%) had parented since adoption at birth, and 1 (7.5%) parented older than birth. Because there was no variation in maternal RTL responses, a t-test and correlational analysis could not be performed.

Although parenting experience was not an outcome variable, it was one of several variables hypothesized to influence maternal RTL and was explored, using a chi square test, to determine if there were differences in parenting experience by the categorical variables of race, marital status, income, maternal education, pumping, NICU experience, and RN education. A two-tailed Fisher's Exact test revealed one significant, but expected outcome; that there was a significant difference between expected and observed frequencies in the parenting experience group and the pumping group (25% of mothers had previously pumped and all of these mothers had parented their biological baby from birth) ($p = .042$).

The mean number of living children reported by mothers was 1.2 ($SD = 1.41$). This variable had a symmetrical distribution. An independent samples t-test compared number of living children by the categorical variables of maternal race, marital status, income, parenting experience, pumping, NICU experience, and maternal and RN education. Aside from expected outcomes related to having children and having parenting experience, no other statistically significant associations were found.

Research Question #9: What is the relationship of level of maternal education to mother's perception of readiness to learn?

Seven (35%) of the mothers were college educated and 13 (65%) had a high school education. A correlational analysis was not possible due to lack of variability in the dependent variable, maternal RTL. To further explore maternal education, a factor which was hypothesized to influence maternal RTL, a chi square test was used. A two-tailed Fisher's Exact test determined that there were no statistically significant differences in maternal education by the other categorical variables (maternal race, marital status, income, parenting experience, pumping, NICU experience, and RN education).

Research Question #10: What is the relationship between maternal CTF, anxiety, parenting experience, and education level, and nurse perceptions of RTL and CTF and maternal RTL?

The intended purpose of this question was to investigate, using multiple regression, the relationship between the independent variables of maternal CTF, anxiety, parenting experience, maternal education, and nurse perceptions of maternal RTL and CTF and the dependent variable of maternal RTL. Since there was no variation in the dependent variable, a regression was not appropriate.

Summary

The dependent variable, maternal RTL, had no variation (Research Question 1). All maternal participants perceived that they were RTL now. No statistical analyses, therefore, were possible using maternal RTL as the dependent variable, negating the ability to run some of the initial, intended statistical analyses for Research Questions (RQ) 1,7,8,9, and 10. As an alternative, secondary data analyses based on normal and non-normal distributions of the measures of central tendency were completed, using the priority independent variables (maternal anxiety, parenting experience and education) as dependent variables, in order to determine which factors may have been influencing them. Correlational analysis was also used among all of the continuous variables that had variability.

For RQ 2, a majority of nurses perceived that mothers were RTL within 4 hours of survey completion. They cited rationales for maternal RTL of motivation for active involvement in the infant's care as well as providing the best possible nutrition. There was a statistically significant difference in values of nurses' perceptions of maternal readiness timing when compared by RN education level. A Pearson correlation revealed a statistically significant negative correlation between RN RTL and Maternal CTF.

RQ 3 compared the matched maternal and nurse responses to the RTL question. There was a mean difference of 3.3 hours, with nurses perceiving that mothers needed more time to learn than mothers perceived of themselves.

RQ 4 examined maternal CTF and concluded that a majority of mothers felt confident. There were no significant differences between this variable when compared by any of the categorical variables. It was significantly negatively correlated to RN RTL.

RQ 5 examined RN CTF and concluded that a majority of nurses perceived their assigned patients as moderately to fully confident to feed their infants. RN CTF had a significantly different value when compared across maternal race and education level. RN CTF was also significantly correlated with RN Age and RN general experience.

RQ 6 determined the matched-pair responses of mothers and nurses on the CTF question. The mean difference was 0.7 and the perception of confidence among maternal and nurse participants was significantly and positively correlated.

RQ 7 asked whether maternal anxiety level was related to maternal RTL. This could not be determined due to a lack of variability in the dependent variable. A majority of mothers rated their current (state) anxiety level as mild or moderate. Maternal anxiety was significantly negatively correlated to maternal CTF, RN experience, RN OB experience, and RN age.

RQ 8 asked whether parenting experience was related to maternal RTL. This could not be determined due to a lack of variability in maternal RTL responses. A majority of mothers described themselves as having parenting experience and parenting their infants from birth. When parenting experience and number of living children were compared to other like variables, there were expected outcomes; parenting experience was related to pumping experience and having living children.

RQ 9 asked whether maternal education level was related to maternal RTL. This could not be determined due to a lack of variability in maternal RTL responses. A majority of mothers were high school-educated. There were no statistically significant findings when this variable was compared across the other categorical variables.

RQ 10, which was intended to investigate the relationship of the independent variables of anxiety, parenting experience, maternal education, and level of nurse astuteness and the dependent variable of maternal RTL, could not be investigated due to lack of maternal RTL variability.

The next chapter will include a discussion of these results and their connection to extant literature. Chapter 5 will also include limitations of the study, nursing education and clinical implications of the findings, plans for future research, and a summative conclusion.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this study was to investigate the timing of maternal perceptions of readiness to learn and confidence about infant feeding, to compare those perceptions with those of the postpartum nurses assigned to care for these mothers, and to investigate factors which might affect readiness to learn and confidence to feed. A synthesis of the data analysis findings, related to each research question is presented in this chapter. The research findings as they relate to the extant literature are also presented. Finally, there is a discussion of how the findings may be applied to clinical practice and education, strengths and limitations, and recommendations for future research.

Discussion by Research Question

Research Question 1: When do new mothers perceive that they are ready to learn (RTL) about infant feeding?

All participants rated their readiness to learn as “0”, meaning that they were ready to learn at the time of survey completion. Because there was no variation in this dependent variable, statistical analysis methods which rely on variance were not possible. The researcher hypothesizes that this homogeneous response may have resulted from a measurement artifact or inconsistency in data collection protocol. A measurement method artifact may have resulted from placing the directive to place a “0” as a response if the mother was ready “now” just before the written response area. A second alternative explanation of data collection protocol inconsistency was reflected in the fact that surveys were not distributed within the desired six-hour window after delivery. That is, nurses were not consistently compliant with survey distribution during the formal data collection period, so the researcher began distributing surveys

directly to mothers and nurses on an on-call basis after participants delivered. Therefore, mothers may have had more time to recuperate physically and make the psychological adjustment to having an infant in the NICU who may or may not be unstable. There may have been an increased tendency to respond with the zero response because of this longer adjustment period, allowing mothers to be ready to receive new information at the time of survey completion. As one mother stated, “I probably would have asked you to leave the room if you had given me the survey within the first few hours after delivery”. If mothers weren’t ready to complete the surveys in the immediate postpartum timeframe, this would suggest that they were not ready to learn either.

Mothers were also asked to provide rationale for their responses. They listed: being proactive, being actively involved, making the personal decision to provide breast milk and having previous experience. From these categories, themes of being active and providing the best possible nutrition for baby emerged. The concept of being actively involved is aligned with the literature linking engagement to maternal empowerment (De Azevedo & Mendes, 2008; Erdem, 2010; Jopek, Gadzinowska-Szczucińska, & Szczapa, 2009; Wigert, 2006).

Research Question #2: When do the nurses assigned to these mothers perceive that the mothers are ready to learn (RTL) about infant feeding?

A majority of nurses rated their assigned mothers as RTL within 0-4 hours from the time of survey completion; in fact, 50% of respondents perceived that their patients were ready now. Since the data were skewed toward the lower number of hours, the median is more robust against skewness, and this was a small sample size, the median and interquartile ranges were determined. A median of one hour suggests that nurses perceived that their patients were ready and able to learn about infant feeding and that they did not require additional physical or

psychological recovery or preparation time. This may be a function of the additional recovery time which the delay in survey distribution provided or high levels of nurse confidence in their teaching ability.

Nurses were also asked to provide rationale for their responses. They listed: motivation, being active, previous experience, support network, processing time, bonding, medical and psychological stability, learning how to pump/pumping, and maturity. These categories represented the nurse's rationale for her perception of the mother's timing of RTL. From these categories emerged themes of activity, previous life experience, and familial and situational factors which supported an earlier RTL about infant feeding, suggesting that mothers who were more actively involved and had outside support had improved readiness.

Secondary data analysis was used to examine the continuous RN RTL variable by several categorical variables using the Mann-Whitney test. Associate level nurses perceived that mothers required more time before learning than Bachelor level nurses. Although the nurses with B.S. degrees were younger and had less nursing experience, their perceptions were similar to their own patients in terms of learning about infant feeding. A Pearson correlation revealed a statistically significant negative correlation between RN RTL and Mat CTF. The more confident the mother, the faster her assigned nurse perceived that she would be ready to learn, suggesting that the nurse perceived the more confident mother as possessing the skills necessary to assimilate new information about the infant.

Research Question #3: Are there differences in perception of timing of readiness to learn in the nurse-patient dyad?

The matched pair difference was equal to the RN RTL responses because all maternal responses were "0". As with Question 2, the mean (3.3) and 95% C.I. (1.3/5.2) suggested that

nurses perceived mothers as being RTL within a short time of survey completion. Nurses, however, perceived that mothers needed more time to be RTL than did the mothers to whom they were assigned, suggesting that nurses may incorporate more variables into their assessments or perceive less confidence or motivation in the mother than the mother does in herself.

Research Question #4: How confident are new mothers about their ability to feed (CTF) their infants?

Mothers generally felt confident about infant feeding. Seventy-five percent of participants believed that they were moderately confident or certain that they could feed their infants. Confidence is also supported by the median (10), out of a 0-10 scale, and interquartile ranges (6.25, 10).

This outcome, alone, is insufficient to make predictions, so it was analyzed against other variables using a Mann-Whitney test. This test determined that there were no statistically significant differences in the values at the $< .05$ level when compared by categorical variables. As reported in question #2, maternal CTF was significantly negatively correlated to RN RTL, meaning that as maternal confidence rose, nurses perceived that the mothers required less time to be ready to learn.

Research Question #5: How confident are the nurses assigned to these mothers about the mothers' ability to feed their infants?

Nurses generally perceived confidence in their assigned mothers' ability to feed their infants. Eighty percent of nurses scored their assigned mothers at the moderately certain to certain can feed level. These frequencies are aligned with the median (8) and interquartile ranges (6, 9). In order to provide further analysis related to this outcome variable, it was compared across levels of other variables using a Mann-Whitney test. Maternal race and education appeared to have an

influential role with nurses' perception of confidence. College educated, Caucasian mothers were perceived as more confident than non-college educated, African-American mothers. As all nurse participants were Caucasian, they may have felt a stronger connection with Caucasian mothers and, therefore, perceived them as more confident. Nurses may have perceived that a college education allowed mothers to assimilate new knowledge better and, therefore, make mothers more confident about applying knowledge of infant feeding to the act of feeding.

RN CTF was significantly correlated to RN Age and RN Years as a nurse, indicating that the older, more experienced nurses perceived mothers as more confident. This suggests that nurses with more life and job experience felt comfortable with the process of parenting themselves and may have projected this confidence onto their assigned mothers.

Research Question #6: Are there differences in the perception of confidence in the nurse-patient dyad?

Mothers and their assigned nurses generally felt confident about the mother's ability to feed the infant. The mean difference between maternal and nurse perceptions of the maternal CTF was only 0.7 units, suggesting that nurses were attuned to the confidence level of their assigned mothers. This was further supported with a significant positive Pearson correlation between maternal and nurse CTF.

Research Question #7: What is the relationship of level of state anxiety to mother's perception of readiness to learn?

Twelve of 20 mothers (60%) scored in the low range for anxiety and 8 maternal total STAI scores indicated a moderate level of state, or current, anxiety (a score of 40-60). For the latter group, state anxiety was present concurrently with having an infant in the NICU, despite having 12-24 hours to adjust to this situation during the postpartum recovery period. This aligns with

the concept that having an infant in the NICU is a stressful event, possibly from physical separation, concern for the infant's health status, and/or a lack of active involvement in and control of infant care.

The determination of relationship between anxiety and maternal RTL using correlational procedures was not possible due to a lack of variability in the dependent variable. When correlated with other continuous variables, anxiety level was significantly negatively correlated with maternal CTF, nurse experience as an R.N, nurse experience as an obstetrical (OB) R.N. and RN age. In other words, the less anxious the mother was, the more confident she was about infant feeding. And the more experienced and aged her nurse, the less anxious the mother felt. This suggests that mothers who feel confident about feeding their infants, despite physical and health barriers, may believe that there are mediating factors, such as learning about feeding, or previous experience. Additionally, the nurse with more life and clinical experience may portray more confidence and attunement toward the mother's needs, thus decreasing anxiety for the mother.

Research Question #8: What is the relationship of level of parenting experience to mother's perception of readiness to learn?

Sixty-five percent of mothers reported having parenting experience; a large majority of which had parented their infants from birth. Categorical parenting experience, type of parenting experience, and number of previous children could not be correlated with maternal RTL due to lack of variability. In secondary analysis, parenting experience and number of living children were examined to determine if there was a relationship. There were only expected outcomes correlating parenting experience with other variables that could only be true if one were a parent,

such as having other children, or pumping of breasts. Therefore, it is uncertain whether or not parenting experience was related to maternal RTL, and it was not related to other variables.

Research Question #9: What is the relationship of level of maternal education to mother's perception of readiness to learn?

A majority of mothers were high-school educated. Maternal education could not be correlated with maternal RTL due to a lack of variability. It was, however, examined across levels of other variables without any significant results. It is uncertain whether or not maternal education was related to maternal RTL, and it was not related to other variables.

Research Question #10: What is the relationship of maternal confidence in her ability to manage infant feeding and mother's readiness to learn?

The intended purpose of this question was to use statistical regression to investigate the independent variables of anxiety, parenting experience, maternal education, and level of nurse astuteness and the dependent variable of maternal RTL. Since there was no variation in the dependent variable, a regression was not appropriate. Therefore, it is uncertain whether or not the independent variables had a mediating effect between maternal CTF and maternal RTL.

Discussion of Results as they Apply to Extant Literature

The results of this research are discussed in relation to existing literature regarding mothers of NICU infants and readiness focused on maternal stress, the nurse-patient relationship, and readiness to learn. Research indicates that mothers of infants hospitalized in the NICU experience stress and heightened anxiety. In particular, mothers of infants with unstable health conditions tend to report moderate to high levels of state anxiety, feel disempowered, disconnect, and depressed (Elmir, Schmied, Wilkes, & Jackson, 2010; Hillerer, Neumann, & Slattery, 2011). Results of the current research indicated that many maternal participants felt anxious but were

able to focus on providing the best situation possible for their infants. They felt ready to learn and confident to feed despite their anxiety. All mothers reported some level of anxiety. We cannot be certain that being a NICU mother caused this anxiety; but the level of anxiety did not deter the mother's RTL or CTF her infant.

Research has focused on teaching within the nurse-patient relationship in the broader context, and specifically focused on teaching in the perinatal area, teaching in other areas, and incongruent perceptions within the nurse-patient dyad. Existing literature has supported the idea that when nurses establish a rapport with their maternity patients, a feeling of trust is created (Baker, Kuhlmann, & Maglioro, 1989; Panagl, Kohlhauser, & Pollak, 2005). Findings from the current research suggest a possible trusting rapport via the mothers' self-confidence as well as a statistical relationship between maternal CTF and the experienced nurse. This rapport is also reflected in the attunement of the nurse to the patient's perceptions of confidence. Nurse and maternal responses were closely aligned in terms of scoring of CTF. Experienced nurse perceptions, however, were less aligned with maternal perceptions of RTL, than inexperienced nurse perceptions.

Literature related to teaching in other medical scenarios support teaching by forming an individualized learning plan (Bylund, D'Agostino, Ho, & Chewning, 2010; Grahn & Johnson, 1990). Nurses are placed in the role of teacher but don't necessarily have the skills or comfort level to teach. Patients may desire teaching, but don't communicate this clearly to the nurse. Nurses and patients may also have incongruent ideas about content and methodology of the teaching plan. Although the current research did not include an intervention variable of teaching, it did focus on perceptions of RTL and confidence to embrace new learning. As a baseline study, it supports the fact that mothers are ready and willing to learn and generally feel confident

to feed their infants, despite having an infant with a health condition. It also supports the nurse's perception that mothers are ready and confident. These aligned perceptions will support a teaching-learning environment that is customized to the patient.

Literature related to incongruent perceptions within the nurse-patient dyad revealed unsupported nurse assumptions that their teaching was perceived as positive by patients and that nurses were the best clinicians to provide this teaching (Tilley, Gregor, & Thiessen, 1987). Patients, however, reported lower ratings of quality of nurse teaching and requested teaching from providers, not nurses (Lee & Yom, 2006). This literature supported the need for good communication and an individualized teaching plan. The current research was a baseline/exploratory study to determine when mothers were RTL and the level of their CTF and state anxiety, and when and if their assigned nurses perceived that these mothers were RTL and CTF. Nurse and maternal ratings of patient readiness and confidence were closely aligned. Nurses rated some mothers as more confident than others. These mothers happened to be college-educated, Caucasian women (nurses were not aware of maternal educational status). Although maternal age was not significantly correlated with RN CTF, all college-educated mothers were at or above the 50th percentile in this cohort for age. Nurses may have assumed a higher level of education in these mothers. Although the assumption of education being related to readiness to learn is a logical one, less-educated women may be just as ready, based on previous parenting experience, for example. Race alone cannot be a determinant for perception of readiness. Again, non-Caucasian patients may be just as ready to learn as Caucasian patients because of previous parenting experience or education, for example.

Findings from this research fit with theoretical literature related to self-efficacy, self-directed learning, and psychological readiness (Bandura, 1977; Garrison, 1997). Parents who believed in

their ability to parent had better parenting outcomes (Bandura, 1997). Confidence is a component of self-efficacy and was evidenced in the current research findings; mothers generally felt confident to feed their infants, and their nurses generally perceived those mothers as confident as well. All mothers felt RTL now and felt less anxious in the company of more experienced and older nurses. Self-directed learning is a function of environmental factors and openness to learning. Garrison's theory posits that RTL is a human state which allows for openness to receive and apply learning. This "human state" was evidenced by objectively high measures of confidence and RTL, as well as low – moderate levels of anxiety. Additionally, the theoretical framework (see substruction, page 32) for this research posited that maternal anxiety, parenting experience, maternal educational level, and nursing assessment of the mother, with a mediating factor of maternal self-efficacy, influenced the level of maternal RTL and CTF. Although these factors could not be statistically analyzed against maternal RTL (due to lack of variability in the dependent variable), maternal CTF was significantly negatively correlated to RN RTL, meaning that as maternal confidence rose, nurses perceived that mothers were RTL sooner. Nursing assessment of the mother (as measured by RN RTL and RN CTF) was significantly related to maternal education. Characteristics of the nurse, such as age and nursing experience, were significantly related to RN CTF. Anxiety was significantly negatively correlated with maternal CTF, nursing general and specialty experience, and age of the nurse. Therefore, mothers tended to be less anxious when they were confident and their nurses were older and more experienced. Neither parenting experience nor previous education was significantly related to maternal CTF.

Psychological readiness equates to being prepared for the psychological ramifications of life and medical changes, such as parenting a healthy or fragile infant. Readiness must be assessed

by the nurse, not assumed to be present or not present based on external factors. New mothers may be psychologically ready to embrace new learning as a way to feel more connected to their sick newborns. The current research showed that mothers were RTL and CTF despite feeling anxious and despite having an ill newborn. Mothers were able to make the connection between learning and their infants and nurses were astute to this readiness. These results have implications for potentially positive clinical outcomes.

Implications for Nursing Education

One of the original aims of the study was to discover the optimal timing for teaching. For this particular sample, the optimal timing was within the first 6-12 hours after delivery. Although this may present varying levels of discomfort for nursing students, given the physical and emotional symptoms associated with birth and an ill newborn, students should persevere in their attempts to offer teaching to these new mothers, keeping in mind that this may empower the mother.

Associate degree nurses tended to perceive their assigned mothers as RTL more slowly and as more CTF their infants. These nurses were generally older as well. Anecdotally, bachelor degree nurses were more interested in the research, as evidenced by their thoughtful questions throughout the project and their higher consistency of collecting a complete set of measurements. Although bachelor-level nurses appeared to understand the connection between evidence-based practice and the need to participate in research, they perceived mothers as less confident. Increased life and nursing experience appeared to influence perceptions of maternal confidence and higher nurse education level appeared to influence perceptions of maternal RTL. This may also be related to self-confidence within the nurse as a function of possessing life and clinical experience. This speaks to the need to have a heterogeneous group of nursing students and to

tailor nursing education methodology to the varied backgrounds of students. Additionally, the findings have implications related to the content of staff and student education. Communication skills need to be emphasized with both groups, for example, because pointed questions about RTL will, hopefully, elicit a clearer understanding of the mother's current frame of mind. Examples of pointed questions might include asking about previous feeding experience or the content of information to be included in the teaching session. Communicating based on facts, not assumptions, will also lead to a more personalized teaching plan. Also, it would be important to emphasize research application; not simply content. In the current study, there was a lack of connection between the understanding of working within an evidence-based practice and the need to facilitate the collection of evidence.

Implications for Clinical Practice

The fact that 100% of maternal participants perceived that they were ready to learn now was unexpected and clinically relevant. This is true of the five pilot participants as well as those involved in the formal data collection phase. Although the researcher cannot be certain why there was a homogeneous response, it is likely due to factors involving the timing of survey distribution, motivation to succeed at parenting, previous experience, and a comfort level with the environment and with a dedicated group of registered nurses. These nurses were also fairly well attuned to their assigned mothers, as evidenced by an average 3.3-hour time difference between the dyad's RTL timing. Nurses were more attuned than the investigator originally hypothesized. This is a clinically positive outcome.

During the pilot phase, surveys were distributed directly by nurses within the desired, six-hour time frame. Those five mothers were RTL now. During formal data collection, surveys were distributed between 12-24 hours by the investigator, so one could hypothesize that

outcomes from the pilot phase were a good indicator of RTL during the formal phase. Nurses agreed to participate, were trained, found no significant problems with the protocol, yet did not comply with the protocol. This lack of compliance was a limitation but also has clinical implications. This may have happened due to a lack of motivation or stake in the research and/or a lack of awareness that being part of an evidence-based practice requires the collection of evidence. This lack of compliance persisted despite the P.I.'s reminder that participation in research is a professional responsibility.

Mothers generally felt ready to learn and confident to feed. Nurses shared this perception of their assigned mothers. Nurses were generally attuned to their patients. Although this does not support the hypothesis that nurses may make inaccurate assumptions about RTL in order to protect a mother whom they perceive to be fragile, this is a positive outcome for nurses and supports them as competent caregivers.

An air of confidence convinced nurses that mothers were RTL sooner. This is clinically relevant in that confidence may be visualized and perceived apart from the physical assessment. A confident mother may, therefore, receive teaching sooner because her nurse believes that she's ready and able to embrace new learning.

Despite being CTF their infants, 40% of mothers were moderately anxious at the time of survey completion. This occurred despite having 12-24 hours to assimilate the infant's health situation. Nurses need to be attuned to this anxiety and ask pointed questions about the current state of mental health during the assessment phase. Examples of questions might include asking patients to rate their anxiety level on a 1-10 scale or asking about current level of concentration. Nurse confidence, from life and clinical experience, appeared to minimize anxiety, suggesting

that nurses of varying ages and experience need to portray an air of confidence and professionalism when interacting with patients.

Strengths and Limitations of the Research

The protocol was well-designed in that, despite bed flow changes involving three nursing units to which postpartum patients could potentially be admitted, nurses understood the protocol and surveys were completed. There were very few maternal refusals during the consent and data collection phases. This may have been in part due to a thorough informed consent process and diligent follow-up by the P.I.

During the pilot phase, the first five participating nurses distributed the surveys per the original protocol and found the protocol to be feasible. During the formal data collection phase, however, nurses were ultimately willing to participate by taking the surveys but not to facilitate their distribution, which greatly diminished the ability to distribute the maternal surveys within six hours as planned. There were also several instances where only part of the set of three surveys (two for mother, one for nurse) were returned by the nurse, thus rendering the entire set of demographic and measurement information for the maternal-nurse dyad unusable. Mothers reported some frustration with this outcome because they were interested in taking part in the research and had provided confidential information which could not be used.

Anecdotal observations of nurse conversations elicited a sense that the participating nurses perceived the survey distribution as optional or casual vs. mandatory. Other possible explanations of non-compliance are patient care demands, a lack of confidence to facilitate the survey distribution/explanation adequately, or a feeling of pressure to originally consent. In hindsight, the researcher would design the protocol so that mothers would be consented and surveys would be distributed in the mother-baby/postpartum environment only as opposed to

before giving birth. This avoids having to predict whether or not an infant will be admitted to the NICU. It presents a wide array of lengths of stay, and physical and emotional scenarios. It also allows surveys to be given directly to patients and nurses by the P.I., along with a brief overview, and encourages timely survey completion.

With regard to the RTL question, future surveys would include a larger separation or distinction between the written directions and the first response area, or imbed the RTL now = 0 directive within the directions as opposed to making it the last statement. In terms of eliciting more variance in this question response, the researcher could provide a more categorical response option, such as “now”, “in the next 4 hours”, “later today”, etc. Perhaps the open-ended nature of choosing any number of hours was actually more of a limiting factor than being given the choice between categories. There could also be a retrospective question about RTL posed to the mothers. This would query their RTL timing prior to the time of survey completion. For example, "when after giving birth did you feel ready to learn about feeding your infant"? This would provide additional information, especially if survey distribution was unexpectedly delayed. It would also allow more latitude with regard to survey completion time frames. With regard to nurse compliance, incorporating the measurements into the nurse’s daily paperwork vs. housing the surveys separately in the locked staff lounge might elicit improved survey facilitation, e.g., distributing the survey with information about baby pictures or financial assistance. Also, had the computerized research participant flag been functional, this would have provided another reminder of participant status on the same screen on which nurses entered assessment data on each new patient. The hospital, in general, and specific managers need to support participation in research. There may be improved participation when nurses are encouraged to join research committees and other forums which allow them to share ideas within

and outside of their respective units. This may foster a culture where research is seen as a professional responsibility and a connection between evidence and practice change.

Conclusions and Recommendations for Future Research

When an infant is admitted to the NICU, it is a stressful time for new mothers. These mothers must deal with their own physical recovery, learning self- and infant care, and the psychological and other ramifications of having an unhealthy newborn. The participants in this study were quite remarkable in that their readiness and confidence transcended their anxiety about a stressful situation. Nurses were closely attuned to maternal feelings of confidence and generally well-attuned to readiness cues. Although the original protocol needed to be altered in terms of survey distribution, real-time RTL and CTF perceptions were elicited. Mothers and nurses were influenced by demographic factors within the dyad, such as education and experience.

This research functioned as a baseline, descriptive study to determine real-time maternal RTL timing about infant feeding. It also investigated nurse attunement to assigned mothers' readiness. The study was conceived because of the researcher's interest in learning, her postpartum nursing experience, which elicited a pattern of observations of missed teaching opportunities between fellow nurses and their postpartum patients, and the researcher's nursing education and counseling experience. This study was also a follow-up to another descriptive study by the researcher which offered suggestions for postpartum nurses about when and how to determine RTL in their patients.

The results of this study help to bridge the gaps in knowledge surrounding postpartum readiness and some of the factors which influence it. It also focuses on the unique relationship between the new mother and her postpartum nurse. It causes some concern about a lack of connection between nursing interest in the project and actual distribution of the surveys. It

appeared that nurses saw this task as optional, despite agreeing to participate. This was evidenced when the first eight participants were missed and seven survey packets were returned incomplete. As mentioned in the limitations section, the delay in survey distribution allowed more time for participants to stabilize after delivery, both physically and psychologically. But, despite diligent follow-up by the researcher, which included tracking each participant after delivery, reminding each mother and her assigned nurse about the protocol, maternal interest in completing the surveys, and a time-limited scenario during which nurses needed to complete and collect surveys prior to their departure that evening, there were several instances of incomplete survey collection and return.

Future research should include pre- and post-measurement of RTL timing and other factors after nurse teaching. This pre-post intervention design is envisioned to ask mothers a RTL question in real-time and then deliver part one of a prescribed teaching module on infant feeding, after which mothers would be asked to rate their RTL timing, in hours, for part two of the module. A number of other factors could be explored as well, including intent to breastfeed, anxiety level, maternal rating of nurse competence, or RTL based on level of infant health condition. This could be done with mothers of healthy and/or unhealthy infants. The researcher would like to ultimately determine whether teaching about milk expression/pumping increases the amount of pumping and the availability of mother's milk to the NICU infant and whether increased availability of mother's milk increases NICU infant health outcomes. This second study is envisioned to be similar to the RTL intervention study, except the teaching module would be specifically about pumping. It would also include a measure of the time between pumping and delivery of mother's milk to the NICU infant, as well as a measurement of infant health outcomes depending on amount and timing of receipt of mother's milk.

Future research questions would relate to whether there is a relationship between teaching about pumping and timing of pumping, quantity of mother's milk, timing of delivery to infant, and/or VLBW infant outcomes. The hypotheses would be that the teaching intervention would increase the incidence of pumping, increase the quantity of milk, decrease the length of time between pumping and ingestion by the infant, and increase objective outcomes of infant health status.

In conclusion, this research has explored multiple factors of RTL and CTF in mothers of NICU infants, as well as the perceptions of their nurses. Mothers wanted to participate in the health outcomes of their infants, despite anxiety, and nurses were attuned to their patients. This research has supported extant research on the empowerment of mothers through active involvement with the infant, as well as the need for a thorough nursing assessment. It has also supported the need for continued nursing education related to research participation. Understanding the factors which influence readiness will support future research about how this readiness can improve infant outcomes.

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Appendix A

Demographic Form - Mothers

Please answer the following questions. These questions help to describe the study participants. Your honest responses are appreciated and will be known only to the researcher.

1. **What is your current age?** _____
2. **What is your race?** African-American _____ White _____ Native American _____
Hispanic/Latino _____ Oriental _____ Other (write) _____
3. **What is your current marital status?** Married _____ Single _____ Engaged _____
Separated _____ Divorced _____ Widowed _____
4. **What is your family's approximate total income per year?**
\$25,000 - \$50,000 _____ \$51,000 - \$100,000 _____ Over \$100,000 _____
5. **Which category best describes your highest completed level of education (please circle one)?**
Less than High School Diploma or GED
High School Diploma
College Degree
Graduate school Degree
6. **Have you been prescribed psychiatric medication or received talk therapy for anxiety, depression, or any other major psychiatric illness in the past 12 months (Y or N)?**

7. **Have you been a parent before through birth, adoption, or marriage (Y or N)?** _____
8. **Which category best describes your parenting experience (please circle one)?**
No previous experience
Parenting your biological baby from birth
Adopting and parenting a baby from birth
Parenting through adoption or marriage/union from an age older than birth
9. **How many of your children have you breastfed (write a number)?** _____
10. **How many of your children have you bottlefed (write a number)?** _____
11. **Have you ever pumped your breasts to collect breast milk (Y or N)?** _____

12. Have you been a parent to a NICU infant in the past (Y or N)? _____

13. How many living children do you have through birth, adoption, or marriage? _____

**14. How long have you been a patient on the antepartum unit (in days/weeks/months)?
_____**

**PLEASE SEAL AND RETURN THIS FORM TO YOUR NURSE OR THE
RESEARCHER.**

THANK YOU.

Appendix B

Demographic Form - Nurses

Please answer the questions below related to your background information. This information is helpful when describing the participants in the study. Your honest responses are appreciated and will be known only to the researcher.

Your NAME: _____

Today's Date: _____

What is your current age? _____

How many years have you been a Registered Nurse? _____

How many years have you worked as a Registered Nurse in Obstetrics? _____

What is your highest completed nursing degree (ADN, BSN, MSN, doctoral)? _____

PLEASE SEAL AND RETURN THIS FORM TO THE RESEARCHER OR TO THE DESIGNATED DROP BOX. THANK YOU.

Appendix C

STAI Sample Questions

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-1

Please provide the following information:

Name _____ Date _____ S _____

Age _____ Gender (Circle) M F T _____

DIRECTIONS:

A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel *right now*, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

VERY MUCH SO
MODERATELY SO
SOMEWHAT
NOT AT ALL

- 1. I feel calm 1 2 3 4
- 2. I feel secure 1 2 3 4
- 3. I am tense 1 2 3 4
- 4. I feel strained 1 2 3 4
- 5. I feel at ease 1 2 3 4

PLEASE SEAL YOUR COMPLETED QUESTIONNAIRE IN THE ENVELOPE PROVIDED. YOUR NURSE WILL COLLECT IT. THANK YOU.

Appendix E

Readiness to Learn and Confidence to Feed Questions

Nurses

Exploring Factors of Readiness to Learn about Infant Feeding in Mothers of NICU Infants

Form 2: Readiness to Learn and Confidence to Feed

Nurses

Today's Date and Time?

Please answer the following question with the *number of hours from now* that BEST represents when you think the mother will be ready to learn about feeding her infant. Even if she cannot feed her infant directly, we want to know when you think she would be ready to learn about information related to feeding, such as how to breastfeed, bottle feed, or pump and store her breast milk.

If you think she is ready NOW, please write "0".

When is the new mother ready to learn about infant feeding (in hours)? _____ hours

What is it about the mother that helped you to make your decision about when she will be ready to learn (e.g. maternal age, physical condition, anxiety)?

Please rate the following statement based on when your patient's infant is ready to feed:

Your patient will be able to manage the feeding of her baby

(Circle the best NUMBER option)

Cannot do			Moderately certain can do					Certain can do		
0	1	2	3	4	5	6	7	8	9	10

What is the Date and Time of Delivery?

Time of admission to this unit? _____

Maternal Diagnosis Prior to Delivery?

Reason for Infant's Admission to NICU, i.e., prematurity, hemodynamic instability, etc. (please give a general response in order to protect the infant's privacy)?

PLEASE MAKE SURE THERE IS A PATIENT LABEL ON ALL QUESTIONNAIRES (NURSE AND PATIENT).

SEAL YOUR COMPLETED QUESTIONNAIRE IN THE ENVELOPE PROVIDED.

PLEASE COLLECT YOUR ASSIGNED PATIENT'S QUESTIONNAIRES AFTER THEY HAVE BEEN SEALED AND DEPOSIT BOTH YOURS AND YOUR PATIENT'S QUESTIONNAIRES IN THE DESIGNATED DROP BOX.

THANK YOU.

Appendix F

Readiness to Learn and Confidence to Feed Questions

Post-pilot Survey

Mothers

1. How well did the question, which asked you to write the number of hours until you were ready to learn about infant feeding, measure the timing of your readiness to learn?

Please circle the best response below:

- 1 (not at all)
- 2 (a little)
- 3 (moderately)
- 4 (quite well)
- 5 (perfect match)

2. How well did the question, which asked you to rate the amount of confidence you had to feed your infant, measure your level of confidence?

Please circle the best response below:

- 1 (not at all)
- 2 (a little)
- 3 (moderately)
- 4 (quite well)
- 5 (perfect match).

Appendix G

Protocol Feasibility

Post-pilot Question

Nurses

The researchers would like to know what you think about the study protocol based on the first one or two NICU mothers to whom you were assigned.

Please write “Yes” next to any statements below that you think were a *problem* as you carried out the protocol.

If you do NOT believe there were any problems, write “No”.

Problems with general study protocol _____

Not understanding specific RN tasks during protocol____ ____

Timing of protocol from the RN perspective_____

If you felt there was a problem, please be as specific as possible in describing the problem as well as any suggestions you might have for a solution to the problem for the remainder of the research protocol.

Thank You

Appendix H

Consent Form – Mothers

RESEARCH CONSENT FORM

Exploring Perceptions of Readiness to Learn about Infant Feeding in Mothers of NICU Infants

You are being asked to join a research study. You are being asked to take part in this study because your baby may be/has been admitted to the Neonatal Intensive Care Unit (NICU). You do not have to participate in this research study. The main purpose of research is to create new knowledge for the benefit of future patients and society in general. Research studies may or may not benefit the people who participate.

Research is voluntary, and you may change your mind at any time. There will be no penalty to you if you decide not to participate, or if you start the study and decide to stop early. Either way, you can still get medical care and services at New Hanover Regional Medical Center (NHRMC).

This consent form explains what you have to do if you are in the study. It also describes the possible risks and benefits. Please read the form carefully and ask as many questions as you need to, before deciding about this research.

You can ask questions now or anytime during the study. The researchers will tell you if they receive any new information that might cause you to change your mind about participating.

This research study will take place at New Hanover Regional Medical Center with Christine Hadsell, RN as the researcher. About 60 people will be in the study at NHRMC. Dr. Karen Wambach is the faculty advisor and dissertation chair to Christine Hadsell who is a PhD student at the University of Kansas.

BACKGROUND

Nurses need to understand when new mothers are ready to learn in order to teach them at the appropriate time. When new mothers have infants in the NICU, they cannot always give direct care or feed their infants. One of the things that mothers can do is to learn about how to feed their infants, such as how to pump and store their breast milk or how to breastfeed or bottle feed when the infant is ready. We already know that mothers feel encouraged when they can take an active role in the care of their infants. What we don't know is when mothers are ready to learn about this care or when their nurses think that these mothers may be ready. We also don't know what factors may add to being ready to learn in the postpartum setting.

PURPOSE

By doing this study, researchers hope to learn about the timing of mothers' readiness to learn, the timing of when their nurses believe that these mothers are ready to learn, and what factors may affect the timing of readiness to learn, such as earlier education, health status, and parenting experience.

PROCEDURES

If you are eligible and decide to participate in this study, your part will last approximately 10 minutes. Your part will first involve a screening interview with the researcher, where you will complete a form which asks you about things like your age and marital status, as well as your previous parenting experience and level of education. This interview may happen while you are pregnant or after you have given birth to the baby and recovered from delivery.

Shortly after you arrive to the postpartum/antepartum unit, after recovering from your baby's birth, the nurse will give you 2 short surveys to complete after the nurse does the first physical assessment with you. One survey has 20 short statements about anxiety and the other has 2 questions, asking when you are ready to learn about infant feeding and how confident you feel about feeding your infant. You will be asked to complete your name, the day/time that your infant was born, and the current date/time. Depending on the time of your enrollment in the study, you may also be asked to evaluate the questions about learning and confidence because they are new research tools. This would be done on the day following your completion of the questions described above. Again, the total time to complete both surveys is 10-15 minutes.

The nurse will leave the room while you complete the surveys. The nurse will be answering the same questions about when you are ready to learn and how confident the nurse thinks that you are. The nurse will also answer a question which asks about the reason for your infant's admission to the NICU. The nurse is being asked to only give a very general response, in order to protect your infant's confidentiality. After you have completed the surveys, you will be asked to seal them in the envelope provided. The nurse will collect your surveys AFTER they have been sealed, so no one will see your responses except the researcher. Once you have completed the surveys, your participation is done.

RISKS

There are no known risks to you during this study. You will be responding to statements about anxiety, so you may feel some unease about your responses. Your responses will be known only to you and the researcher. Your name will not be connected to your responses once the researcher inputs your data into the computer. The researcher will use a code instead of your name.

There may be other risks of the study that are not yet known.

NEW FINDINGS STATEMENT

You will be told about anything new that might change your decision to be in this study. You may be asked to sign a new consent form if this occurs.

BENEFITS

There are no direct benefits to you for taking part in this study. However, researchers hope that

the information from this research study may lend knowledge for use in teaching mothers about infant feeding when they are ready to learn and making nursing practice better.

ALTERNATIVES

Participation in this study is voluntary. Deciding not to participate will have no effect on the care or services you receive at NHRMC.

COSTS

There is no cost for being in the study.

PAYMENT TO SUBJECTS

There is no payment for this study.

INSTITUTIONAL DISCLAIMER STATEMENT

If you think you have been harmed as a result of participating in research at the University of Kansas Medical Center (KUMC), you should contact the Director, Human Research Protection Program, Mail Stop #1032, University of Kansas Medical Center, 3901 Rainbow Blvd., Kansas City, KS 66160. Under certain conditions, Kansas state law or the Kansas Tort Claims Act may allow for payment to persons who are injured in research at KUMC.

CONFIDENTIALITY AND PRIVACY AUTHORIZATION

The researchers will protect your information, as required by law. Absolute confidentiality cannot be guaranteed because persons outside the study team may need to look at your study records. The researchers may publish the results of the study. If they do, they will only discuss group results. Your name will not be used in any publication or presentation about the study.

Your health information is protected by a federal privacy law called HIPAA. By signing this consent form, you are giving permission for the University of Kansas Medical Center (KUMC) to use and share your health information. If you decide not to sign the form, you cannot be in the study.

The researchers will only use and share information that is needed for the study. To do the study, they will collect health information from the study activities. You may be identified by information such as name, address, phone, date of birth, social security number, or other identifiers. Your health information will be used at KUMC by Christine Hadsell, RN, other members of the research team, the KUMC Human Subjects Committee and other committees and offices that review and monitor research studies. Study records might be reviewed by government officials who oversee research, if a regulatory review takes place.

All study information that is sent outside KU Medical Center will have your name and other identifying characteristics removed, so that your identity will not be known. Because identifiers will be removed, your health information will not be re-disclosed by outside persons or groups and will not lose its federal privacy protection.

Your permission to use and share your health information will not expire unless you cancel it.

QUESTIONS

Before you sign this form, Christine Hadsell, RN should answer all of your questions. You can talk to the researcher if you have any more questions, suggestions, concerns or complaints after signing this form. If you have any questions about your rights as a research subject, or if you want to talk with someone who is not involved in the study, you may call the Human Subjects Committee at (913) 588-1240. You may also write the Human Subjects Committee at Mail Stop #1032, University of Kansas Medical Center, 3901 Rainbow Blvd., Kansas City, KS 66160.

SUBJECT RIGHTS AND WITHDRAWAL FROM THE STUDY

You may stop being in the study at any time. Your decision to stop will not prevent you from getting treatment or services at NHRMC. The entire study may be discontinued for any reason without your consent by the investigator conducting the study.

You have the right to cancel your permission for researchers to use your health information. If you want to cancel your permission, please write to Christine Hadsell, RN, MA, PhD(c) at chadsell@kumc.edu or Karen Wambach, PhD at the University of Kansas Medical Center, 3901 Rainbow Boulevard, Kansas City, KS 66160. If you cancel permission to use your health information, you will be withdrawn from the study. The research team will stop collecting any additional information about you. The research team may use and share information that was gathered before they received your cancellation.

CONSENT

Christine Hadsell, RN has given you information about this research study. She has explained what will be done and how long it will take. She explained any inconvenience, discomfort or risks that may be experienced during this study.

By signing this form, you say that you freely and voluntarily consent to participate in this research study. You have read the information and had your questions answered.

You will be given a signed copy of the consent form to keep for your records.

Print Participant's Name

Signature of Participant

Time

Date

Print Name of Person Obtaining Consent

Signature of Person Obtaining Consent

Date

Appendix I

Consent Form - Nurses

RESEARCH CONSENT FORM

Exploring Perceptions of Readiness to Learn about Infant Feeding in Mothers of NICU Infants

You are being asked to join a research study. You are being asked to take part in this study because you are a nurse working on a unit which cares for mothers whose baby may be/or has been admitted to the Neonatal Intensive Care Unit (NICU). You do not have to participate in this research study. The main purpose of research is to create new knowledge for the benefit of future patients and society in general. Research studies may or may not benefit the people who participate.

Research is voluntary, and you may change your mind at any time. There will be no penalty to you if you decide not to participate, or if you start the study and decide to stop early. Either way, you can still continue to be an employee at New Hanover Regional Medical Center (NHRMC).

This consent form explains what you have to do if you are in the study. It also describes the possible risks and benefits. Please read the form carefully and ask as many questions as you need to, before deciding about this research.

You can ask questions now or anytime during the study. The researchers will tell you if they receive any new information that might cause you to change your mind about participating.

This research study will take place at NHRMC with Christine Hadsell, RN as the researcher. About 60 people will be in the study at NHRMC. Dr. Karen Wambach is the faculty advisor and dissertation chair to Christine Hadsell, who is a PhD student at the University of Kansas.

BACKGROUND

Nurses need to understand when new mothers are ready to learn in order to teach them at the appropriate time. When new mothers have infants in the NICU, they cannot always give direct care or feed their infants. One of the things that mothers can do is to learn about how to feed their infants, such as how to pump and store their breast milk or how to breastfeed or bottle feed when the infant is ready. We already know that mothers feel encouraged when they can take an active role in the care of their infants. What we don't know is when mothers are ready to learn about this care or when their nurses think that these mothers may be ready. We also don't know what factors may add to being ready to learn in the postpartum setting.

PURPOSE

By doing this study, researchers hope to learn about the timing of mothers' readiness to learn, the timing of when their nurses believe that these mothers are ready to learn, and what factors may affect the timing of readiness to learn, such as earlier education, health status, and parenting

experience.

PROCEDURES

If you are eligible and decide to participate in this study, your participation will last approximately 10-15 minutes. Your part will involve the initial screening by the researcher, where you will be given training about the research project, decide whether or not you want to participate, and complete a demographic form. Your information will be known only to the researcher. Your information will be coded before it is entered into the computer, so it will be kept confidential. Only group information, not individual information, will be reported.

During the first physical assessment of your patient, shortly after she arrives on your nursing unit after delivery, you will give her a survey and 2 additional questions to complete. The mother's survey has 20 short statements about anxiety, 1 question about the mother's readiness to learn, and 1 question about the mother's confidence to feed the infant. You will also complete 2 questions, which ask about when you think the mother is ready to learn about infant feeding and the mother's ability to manage feeding. You will also be asked to note your name, the day and time of delivery, the current day, and current time, and the reason for the infant's admission to the NICU. You may also be asked to evaluate the questions about learning and confidence because they are new research tools. This would be done on the day following your completion of the questions described above. You will leave the room while the patient completes the surveys and you will complete your survey at the same time, in a separate location. After you have completed the survey, you will be asked to seal it in the envelope provided. You will collect yours and your patient's surveys AFTER they have been sealed, so no one will see the responses except the researcher. Once you have completed, collected, and deposited the surveys in a designated locked box, your participation is done. Please note that if you care for more than one mother of a NICU infant during the study period, your participation will be repeated.

RISKS

There is the potential that you feel some unease from divulging your age. You will be responding to one question about timing of readiness to learn, one question about the mother's confidence to feed and the demographic form. Your responses and your patient's responses will be coded to protect confidentiality prior to data input.

There may be other risks of the study that are not yet known.

NEW FINDINGS STATEMENT

You will be told about anything new that might change your decision to be in this study. You may be asked to sign a new consent form if this occurs.

BENEFITS

There are no direct benefits to you for taking part in this study. However, researchers hope that the information from this research study may lend knowledge for use in teaching mothers about infant feeding when they are ready to learn and making nursing practice better.

ALTERNATIVES

Participation in this study is voluntary. Deciding not to participate will have no effect on your job at NHRMC.

COSTS

There is no cost for being in the study.

PAYMENT TO SUBJECTS

There is no payment for this study.

INSTITUTIONAL DISCLAIMER STATEMENT

If you think you have been harmed as a result of participating in research at the University of Kansas Medical Center (KUMC), you should contact the Director, Human Research Protection Program, Mail Stop #1032, University of Kansas Medical Center, 3901 Rainbow Blvd., Kansas City, KS 66160. Under certain conditions, Kansas state law or the Kansas Tort Claims Act may allow for payment to persons who are injured in research at KUMC.

CONFIDENTIALITY AND PRIVACY AUTHORIZATION

The researchers will protect your information, as required by law. Absolute confidentiality cannot be guaranteed because persons outside the study team may need to look at your study records. The researchers may publish the results of the study. If they do, they will only discuss group results. Your name will not be used in any publication or presentation about the study.

QUESTIONS

Before you sign this form, Christine Hadsell, RN should answer all your questions. You can talk to the researcher if you have any more questions, suggestions, concerns or complaints after signing this form. If you have any questions about your rights as a research subject, or if you want to talk with someone who is not involved in the study, you may call the Human Subjects Committee at (913) 588-1240. You may also write the Human Subjects Committee at Mail Stop #1032, University of Kansas Medical Center, 3901 Rainbow Blvd., Kansas City, KS 66160.

SUBJECT RIGHTS AND WITHDRAWAL FROM THE STUDY

You may stop being in the study at any time. Your decision to stop will not prevent you from working as a nurse at NHRMC. The entire study may be discontinued for any reason without your consent by the investigator conducting the study.

CONSENT

Christine Hadsell, RN has given you information about this research study. She has explained what will be done and how long it will take. She explained any inconvenience, discomfort or risks that may be experienced during this study.

By signing this form, you say that you freely and voluntarily consent to participate in this research study. You have read the information and had your questions answered.

You will be given a signed copy of the consent form to keep for your records.

Print Participant's Name

Signature of Participant

Time

Date

Print Name of Person Obtaining Consent

Signature of Person Obtaining Consent

Date

Appendix J

Summary Document for Nurses

Title of Study: Exploring Factors of Readiness to Learn about Infant Feeding in Mothers of NICU Infants

Principal Investigator: Christine Hadsell, RN, MA, PhD(c)

Contact Information: 518/577-9146 (cell) – please feel free to call me any day between 9am-10pm with questions

Protocol:

1. Nurse attends training session, reviews and signs consent to participate and completes demographic form
2. Participating nurse is assigned to participating postpartum patient who’s infant is in the NICU
3. Nurse checks EPIC for study participant FLAG
4. If nurse and patient are participants in study, proceed to #5. If not, STOP. Please direct any questions about list of study participants to P.I.
5. Nurse assesses postpartum patient within first 6 hours of admission
6. If patient is stable, nurse leaves Readiness to Learn (RTL) and Confidence to Feed (CTF) (1 questionnaire) + State-Trait Anxiety Inventory (STAI) with mother
7. If patient is not stable initially, but is stable within 6 hours, nurse leaves questionnaires at that time
8. While patient is completing questionnaires, nurse completes RTL/CTF questionnaire in a separate location
9. All participants should SEAL their questionnaire(s) in the envelope provided
10. Nurse collects all documents and deposits in locked drop box on unit

Document	For Whom?	Requires Pt Label?	Instructions
Demographic Form	Mothers	Yes	Seal; give to nurse; to drop box
Demographic Form	Nurses	No	Seal; to drop box
RTL/CTF* Questionnaire	Mothers	Yes	Seal; give to nurse; to drop box
RTL/CTF* Questionnaire	Nurses	Yes	Seal; to drop box
State-Trait Anxiety Inventory (STAI)	Mothers only	Yes	Seal; give to nurse; to drop box

*Readiness to Learn and Confidence to Feed Questionnaire

Information for Patients:

You are involved in a study about your readiness to learn about feeding your infant

You have met with Christine Hadsell and signed a consent to participate in this study

Thank you for taking the time to complete these forms, which should take no more than 10-15 minutes

You should answer these questions independently, not with others

All documents should be read over carefully and answered to the best of your ability

All documents should be sealed in the envelope provided and returned to your nurse

All documents will immediately be placed in a locked drop box

No one will see your answers except Christine Hadsell; your health care providers will not see your answers

Appendix K

New Hanover Regional Medical Center

Institutional Review Board

Patient Consent/Authorization Form (Mothers)

Title of Study *Exploring Factors of Readiness to Learn about Infant Feeding in Mothers of NICU Infants*

Principal Investigator: Christine Hadsell, RN, MA, PhD(c)

Practice/Organization/Affiliation: University of Kansas

Address School of Nursing, Mail Stop 2029, 3901 Rainbow Blvd., Kansas City, KS 66160

Phone Number 913-588-1619

You are being asked to take part in a research study. The researcher will explain the study to you. Research studies only include people who choose to take part. Please take your time to make your decision about taking part in this study. You are encouraged to discuss your decision with your family and friends. You can also discuss it with your healthcare providers. If you have any questions, you can ask the researcher.

This study has been reviewed for your safety by the New Hanover Regional Medical Center (NHRMC) Institutional Review Board (IRB). This Board has been established under the authority of the Food and Drug Administration (FDA) for the purpose of protecting the rights and well being of people recruited to participate in research activities. This Board looks at the risks and benefits of each study and receives updated information throughout the study to ensure your safety as a research participant.

Why is this study being done?

The purpose of this study is to understand what factors may influence being ready to learn for mothers who have infants in the Neonatal Intensive Care Unit (NICU).

The main goal of the study is to improve nursing practice during the time after giving birth by understanding more about new mothers who are going through the stress of having an infant in the NICU. There are very few studies that focus on the postpartum nurse and mother relationship as it relates to readiness to learn about infant feeding.

How many people will take part in this study?

Our goal is to enroll up to 60 patients and nurses total in this study in the Antepartum Unit of this hospital.

What will happen if I take part in this research study?

If you are eligible and decide to participate in this study, your part will last approximately 10 minutes. Your part will first involve a screening interview with the researcher, where you will complete a form which asks you about things like your age and marital status, as well as your previous parenting experience and level of education. This interview may happen while you are pregnant or after you have given birth to the baby and recovered from delivery.

Shortly after you arrive to the hospital unit, after recovering from your baby's birth, the nurse will give you 2 short surveys to complete after the nurse does the first physical assessment with you. One survey has 20 short statements about anxiety and the other has 2 questions, asking when you are ready to learn about infant feeding and how confident you feel about feeding your infant. You will be asked to complete your name, the day/time that your infant was born, and the current date/time. Depending on the time of your enrollment in the study, you may also be asked to evaluate the questions about learning and confidence because they are new research tools. This would be done on the day following your completion of the questions described above. Again, the total time to complete both surveys is 10-15 minutes.

The nurse will leave the room while you complete the surveys. The nurse will be answering the same questions about when you are ready to learn and how confident the nurse thinks that you are. The nurse will also answer a question which asks about the reason for your infant's admission to the NICU. The nurse is being asked to only give a very general response, in order to protect your infant's privacy. After you have completed the surveys, you will be asked to seal them in the envelope provided. The nurse will collect your surveys AFTER they have been sealed, so no one will see your responses except the researcher. Once you have completed the surveys, your participation is done.

How long will I be in the study?

You are asked to take part in the study for approximately 10 minutes to complete the demographic form while you are pregnant and the surveys after delivery. The first five mothers in the study will also be asked to answer 2 brief questions about the study questions. Once you have completed the surveys, your participation is done.

Can I stop being in the study?

Yes. You can decide to stop at any time. Tell the study researcher if you are thinking about stopping or decide to stop.

The researcher may, without your consent, stop you from taking part in this study at any time if the study is stopped. The researcher will tell you if your participation in the study ends early. You will also be told of any new findings that may develop during the study, which may change your willingness to participate in the study.

If you withdraw from the study, the data collected to that point might be included in the research findings to preserve research consistency. The study researcher will decide whether or not the data collected to the time of your withdrawal needs to be included.

What side effects or risks can I expect from being in this study?

Although every effort will be made to keep your personal health information confidential, there is a possibility that it could be re-disclosed to someone that is not bound under the same guidelines to maintain confidentiality.

Risks related to the study include those which are:

NOTE:

- *Psychological: you may feel some unease about providing honest answers about personal information , like your age, or rating your level of anxiety.*
- *Physical: there is NO physical risk to you if you are involved in this study*

For more information about risks, ask the researcher.

Are there benefits to taking part in the study?

There may or may not be any direct benefit to you. However, the knowledge learned from this study may help others in the future.

What other choices do I have if I do not take part in this study?

Your other choices may include:

- *Not to participate in the study.*

Will my medical information be kept private?

The researcher will do her best to make sure that the personal health information (PHI) in your medical record will be kept private. However, we cannot guarantee total privacy. Your PHI may be given out if required by law. If information from this study is published or presented at meetings, your name and other personal information will not be used. The information collected about you while participating in this study will be kept in a confidential computer file which is password protected and able to be accessed only by the researcher.

The PHI that we may use or disclose (release) for this research includes: your self-report of current anxiety, and other demographic information such as race and income. As a result of this disclosure, printed copies of your records may be needed for research documentation.

Organizations and/or individuals that may disclose, receive, look at, and/or copy your medical records for research, quality assurance, and data analysis include:

- **University of Kansas**
- **NHRMC and its IRB**

Once your PHI has been disclosed to the above-listed agencies, the privacy laws may no longer protect it from further disclosure. Your consent to use or disclose the information as described in this consent expires at the end of this study.

You will be asked to provide some personal background information, like age and race, as well as answer some questions about your current level of anxiety. This information is necessary to understand more about factors that may influence your readiness to learn about feeding your infant.

What are the costs of taking part in this study?

There are no costs to you or your health plan/insurance company for your participation in this study.

Will I get paid for taking part in this study?

You will not be paid for taking part in this study.

What happens if I am injured because I took part in this study?

Although there is no physical risk to answering the study surveys, it is important that you tell the researcher if you feel that you have been injured because you took part in this study.

If necessary, you will get medical treatment if you are injured as a result of taking part in this study. You and/or your insurance company will be charged for this treatment. New Hanover Regional Medical Center is not financially responsible for treatment of side effects caused by the study. You and/or your insurance company will be charged for continuing medical care and/or hospitalization.

What are my rights if I take part in this study?

Taking part in this study is your choice. You may choose either to take part or not to take part in the study. If you decide to take part in this study, but change your mind at any time, you may withdraw (revoke) your consent to take part and/or your authorization for us to use and disclose

your personal health information. If you revoke your consent and/or authorization, you can no longer participate in the study.

No matter what decision you make, there will be no penalty to you and you will not lose any benefits to which you are entitled. Leaving the study will not affect your medical care at NHRMC. In the case of injury resulting from this study, you do not lose any of your legal rights to seek payment by signing this form.

Who can answer my questions about the study?

You can talk to the researcher, Christine Hadsell, RN, about any questions or concerns you have about this study while you are a patient in the antepartum unit of NHRMC.

For questions about your rights while taking part in this study, call the NHRMC Institutional Review Board Office at (910) 343-4621.

Where can I get more information?

If you have any questions about your rights as a research subject, or if you want to talk with someone who is not involved in the study, you may call the Human Subjects Committee at (913) 588-1240. You may also write the Human Subjects Committee at Mail Stop #1032, University of Kansas Medical Center, 3901 Rainbow Blvd., Kansas City, KS 66160.

Signatures

I have read or had read to me this consent/authorization form. I understand the information and have had my questions answered. I understand that I will be provided with a signed copy of this form. By signing this consent/authorization form, I agree to take part in this study and authorize the use and disclosure of my personal health information as described in this consent/authorization form. If I do not agree to sign the consent/authorization form, I understand that I will not be able to participate in the study.

Subject:

Print Name _____

Initials _____

Signature _____

Date _____

If the subject is not competent to provide informed consent, this informed consent must be signed by the subject's legally authorized representative (an individual, judicial, or other body) who is authorized under law to consent on behalf of the subject to the subject's participation in the procedures involved in research.

Legally Authorized Representative (LAR) (if applicable):

Print Name _____

Relationship _____

Signature _____

Date _____ *Initials* _____

Witness: The contents of this form were orally presented.

Print Name _____

Signature _____

Date _____

Principal Researcher: I have fully explained to the subject the nature, purpose, and risks of the treatments described above. I have answered any and all questions to the best of my ability.

Print Name _____

Signature _____

Date _____

Appendix L

New Hanover Regional Medical Center

Institutional Review Board

Patient Consent/Authorization Form (Nurses)

Title of Study *Exploring Factors of Readiness to Learn about Infant Feeding in Mothers of NICU Infants*

Principal Investigator: Christine Hadsell, RN, MA, PhD(c)

Practice/Organization/Affiliation: University of Kansas

Address: School of Nursing, Mail Stop 2029, 3901 Rainbow Blvd., Kansas City, KS 66160

Phone Number: 913-588-1619

You are being asked to take part in a research study. The investigator will explain the study to you. Research studies only include people who choose to take part. Please take your time to make your decision about taking part in this study. If you have any questions, you can ask the investigator.

This study has been reviewed for your safety by the New Hanover Regional Medical Center (NHRMC) Institutional Review Board (IRB). This Board has been established under the authority of the Food and Drug Administration (FDA) for the purpose of protecting the rights and well being of people recruited to participate in research activities. This Board looks at the risks and benefits of each study and receives updated information throughout the study to ensure your safety as a research participant.

Why is this study being done?

The purpose of this study is to understand what factors may influence being ready to learn for mothers who have infants in the Neonatal Intensive Care Unit (NICU).

The main goal of the study is to improve nursing practice in the postpartum area by understanding more about postpartum mothers who are going through the stress of having an infant in the NICU. There are very few studies that focus on the postpartum nurse and mother relationship as it relates to readiness to learn about infant feeding.

How many people will take part in this study?

Our goal is to enroll up to 60 patients and nurses total in this study in the Antepartum Unit of this hospital.

What will happen if I take part in this research study?

If you are eligible and decide to participate in this study, your participation will last approximately 10-15 minutes. Your part will involve the initial screening by the researcher, where you will be given training about the research project, decide whether or not you want to participate, and complete a demographic form. Your information will be known only to the researcher. Your information will be coded before it is entered into the computer, so it will be kept confidential. Only group information, not individual information, will be reported.

During the first physical assessment of your patient, shortly after she arrives on your nursing unit after delivery, you will give her a survey and 2 additional questions to complete. The mother's survey has 20 short statements about anxiety, 1 question about the mother's readiness to learn, and 1 question about the mother's confidence to feed the infant. You will also complete 2 questions, which ask about when you think the mother is ready to learn about infant feeding and the mother's ability to manage feeding. You will also be asked to note your name, the day and time of delivery, the current day, and current time, and the reason for the infant's admission to the NICU. You may also be asked to evaluate the questions about learning and confidence because they are new research tools. This would be done on the day following your completion of the questions described above. You will leave the room while the patient completes the surveys and you will complete your survey at the same time, in a separate location. After you have completed the survey, you will be asked to seal it in the envelope provided. You will collect yours and your patient's surveys AFTER they have been sealed, so no one will see the responses except the researcher. Once you have completed, collected, and deposited the surveys in a designated locked box, your participation is done. Please note that if you care for more than one mother of a NICU infant during the study period, your participation will be requested.

How long will I be in the study?

You are asked to take part in the study for approximately 10 minutes to complete the demographic form, distribute the surveys to the new mother, and answer one survey. Once you have completed your surveys, collected all surveys from your assigned patient, and deposited all surveys in the locked drop box, your participation is done. Your participation may be requested for more than one patient if you are again assigned to a participating patient during the same shift or during the entire study period.

Can I stop being in the study?

Yes. You can decide to stop at any time. Tell the study investigator if you are thinking about stopping or decide to stop.

The investigator may, without your consent, stop you from taking part in this study at any time if the study is stopped. The investigator will tell you if your participation in the study ends early. You will also be told of any new findings that may develop during the study, which may change your willingness to participate in the study.

If you withdraw from the study, the data collected to that point might be included in the research findings to preserve research consistency. The study investigator will decide whether or not the data collected to the time of your withdrawal needs to be included.

What side effects or risks can I expect from being in this study?

Although every effort will be made to keep your personal health information confidential, there is a possibility that it could be re-disclosed to someone that is not bound under the same guidelines to maintain confidentiality.

Risks related to the study include those which are:

NOTE:

- *Psychological: you may feel some unease about providing personal information , like your age.*
- *Physical: there is NO physical risk to you if you are involved in this study*

For more information about risks, ask the investigator.

Are there benefits to taking part in the study?

There may or may not be any direct benefit to you. However, the knowledge learned from this study may help others in the future.

What other choices do I have if I do not take part in this study?

Your other choices may include:

- *Taking part in another study.*
- *Not to participate in the study.*

Will my personal information be kept private?

The investigator will do her best to make sure that the personal information will be kept private. However, we cannot guarantee total privacy. If information from this study is published or presented at meetings, your name and other personal information will not be used. The information collected about you while participating in this study will be kept in a confidential

computer file which is password protected and accessible only by the investigator.

Organizations and/or individuals that may disclose, receive, look at, and/or copy your personal information for research, quality assurance, and data analysis include:

- **University of Kansas**
- **NHRMC and its IRB**

Once your personal information has been disclosed to the above-listed agencies, the privacy laws may no longer protect it from further disclosure. Your consent to use or disclose the information as described in this consent expires at the end of this study.

You will be asked to provide some personal background information, like age and length of time as a Registered Nurse, as well as answer questions about your perceptions of readiness to learn and confidence to feed related to your assigned patient. This information is necessary to understand more about factors that may influence her readiness to learn about feeding her infant.

What are the costs of taking part in this study?

There are no costs to you for your participation in this study.

Will I get paid for taking part in this study?

You will not be paid for taking part in this study.

What happens if I am injured because I took part in this study?

Although there is no physical risk to answering the study surveys, it is important that you tell the investigator if you feel that you have been injured because you took part in this study.

If necessary, you will get medical treatment if you are injured as a result of taking part in this study. You and/or your insurance company will be charged for this treatment. New Hanover Regional Medical Center is not financially responsible for treatment of side effects caused by the study. You and/or your insurance company will be charged for continuing medical care and/or hospitalization.

What are my rights if I take part in this study?

Taking part in this study is your choice. You may choose either to take part or not to take part in the study. If you decide to take part in this study, but change your mind at any time, you may withdraw (revoke) your consent to participate and/or your authorization for us to use and disclose your personal information. If you revoke your consent and/or authorization, you can no longer participate in the study.

No matter what decision you make, there will be no penalty to you and you will not lose any benefits to which you are entitled. Leaving the study will not affect your employment at NHRMC. In the case of injury resulting from this study, you do not lose any of your legal rights to seek payment by signing this form.

Who can answer my questions about the study?

You can talk to the investigator, Christine Hadsell, RN, about any questions or concerns you have about this study while you are working in the antepartum unit of NHRMC.

For questions about your rights while taking part in this study, call the NHRMC Institutional Review Board Office at (910) 343-4621.

Where can I get more information?

If you have any questions about your rights as a research subject, or if you want to talk with someone who is not involved in the study, you may call the University of Kansas Human Subjects Committee at (913) 588-1240. You may also write the Human Subjects Committee at Mail Stop #1032, University of Kansas Medical Center, 3901 Rainbow Blvd., Kansas City, KS 66160.

Signatures

I have read or had read to me this consent/authorization form. I understand the information and have had my questions answered. I understand that I will be provided with a signed copy of this form. By signing this consent/authorization form, I agree to take part in this study and authorize the use and disclosure of my personal information as described in this consent/authorization form. If I do not agree to sign the consent/authorization form, I understand that I will not be able to participate in the study.

Subject:

Print Name _____

Initials _____

Signature _____

Date _____

If the subject is not competent to provide informed consent, this informed consent must be signed by the subject's legally authorized representative (an individual, judicial, or other body) who is authorized under law to consent on behalf of the subject to the subject's participation in the procedures involved in research.

Legally Authorized Representative (LAR) (if applicable):

Print Name _____

Relationship _____

Signature _____

Date _____ *Initials* _____

Witness: The contents of this form were orally presented.

Print Name _____

Signature _____

Date _____

Principal Investigator: I have fully explained to the subject the nature, purpose, and risks of the treatments described above. I have answered any and all questions to the best of my ability.

Print Name _____

Signature _____

Date _____

Appendix M

**MEMORANDUM OF UNDERSTANDING (MOU)
BETWEEN
NEW HANOVER REGIONAL MEDICAL CENTER (NHRMC) AND
THE UNIVERSITY OF KANSAS MEDICAL CENTER (KUMC)
FOR DESIGNATION OF INSTITUTIONAL REVIEW BOARD (IRB) OF
RECORD**

I. PURPOSE AND SCOPE

This MOU between New Hanover Regional Medical Center (NHRMC) of Wilmington, North Carolina, a private, not-for-profit hospital located in Wilmington, North Carolina and The University of Kansas Medical Center (KUMC), a State institution of higher learning in the State of Kansas, establishes an agreement for the designation of IRB responsibilities.

WHEREAS, Federal regulations found at 45 CFR 46.114 allow for reliance agreements between institutions when the institutions are engaged in cooperative research projects, in order to avoid duplication of effort; and

WHEREAS, Christine A. Hadsell is conducting human research entitled "Exploring Factors of Readiness to Learn about Infant Feeding in Mothers of NICU Infants" at NHRMC (hereinafter "cooperative research"); and

WHEREAS, Christine A. Hadsell is also a PhD student under the direction of Karen Wambach, RN, PhD, at KUMC; and

WHEREAS, the NHRMC institutional review board (NHRMC IRB), as a qualified IRB, will review the cooperative research, KUMC wishes to rely on the review of NHRMC IRB for the cooperative research, and NHRMC IRB is receptive to KUMC relying on its review, NHRMC IRB and KUMC, as parties, create this agreement in accordance with the terms and conditions herein.

The parties hereby agree as follows:

1. KUMC may rely on the review by NHRMC IRB in accordance with the terms of this MOU for the review and continuing oversight of the cooperative research for the entire duration of the research, until it has been closed by NHRMC IRB.
2. The parties acknowledge each party is responsible for the development and operation of its own human subjects protections programs. Each party reserves the right and retains the ultimate responsibility to determine what research is appropriate to be conducted at its own facilities. Neither party will assume responsibility for any other aspects of the other party's human subjects protection programs or human subjects research operations. Each party will remain responsible for ensuring its own compliance with applicable Federal, State, and local laws regarding human subjects research.
3. During the term of this MOU, each party will maintain an approved Federalwide Assurance (FWA) of compliance with the Office for Human Research Protections

(OHRP), and upon request, provide a copy of its FWA to the other party, and abide by the terms and conditions of their respective FWA and this MOU. In the event a party's FWA is amended in a manner that impacts this reliance agreement, such party will notify the other party and promptly supply a copy of the amended FWA to the other party. For research covered by this agreement, each party agrees to comply with requests for information in its possession that is necessary for oversight by the other IRB.

4. NHRMC IRB shall perform all of the functions required under applicable federal, state, and local laws and regulations, whether foreign or domestic, for reviewing and approving human subjects research in connection with the cooperative research, including, without limitation, 45 CFR 46 and 21 CFR 50 and 56. NHRMC IRB's review and approval shall also be conducted in accordance with all relevant institutional policies regarding human subjects research. The investigators of KUMC will abide by all conditions and determinations made by NHRMC IRB in connection with its review and approval of the cooperative research.
 - a. KUMC will not conduct the cooperative research if it has not been reviewed and approved by NHRMC IRB.
 - b. KUMC will obtain review and approval from NHRMC IRB prior to the implementation of any amendments to the cooperative research.
 - c. KUMC will not conduct the cooperative research if it is suspended or terminated by NHRMC IRB.
5. Both parties shall ensure adherence to this agreement and shall ensure that its employees, investigators, and agents adhere to the applicable federal, state, and local laws, regulations and policies regarding the conduct of human subjects research, including but not limited to, 45 CFR part 46 and 21 CFR parts 50 & 56 and other applicable governmental regulations and guidance.
6. NHRMC IRB and KUMC shall only be responsible, to the extent permitted by law, for actions or claims arising from or caused by willful, reckless, or negligent acts or omissions of their respective officers, employees, and agents thereof.

II. REPORTING.

1. Each party shall immediately (within at least five (5) working days) notify the other, at the contact listed below, in writing, any serious or continuing non-compliance issues involving the cooperative research.
2. Each party shall immediately notify the other, in writing (within at least five (5) working days), if and when an oversight agency or organization initiates any action regarding such noncompliance.

3. NHRMC IRB shall immediately (within at least five (5) working days) report, in writing, to KUMC any determinations made by the IRB of suspension or termination of IRB approval involving the cooperative research.
4. Each party shall immediately (within at least five (5) working days) notify the other, in writing, if any investigator or other employee or research personnel involved in the cooperative research is suspended, debarred, or receives any other restriction of any duties whether clinical or research related.
5. Each party shall immediately (within at least five (5) working days) notify the other, at the contact listed below, any information which it may acquire about the cooperative research that may be relevant to a determination of non-compliance, unanticipated problems involving risks to subjects or others (including adverse events), or suspension or termination of the research by NHRMC IRB.

III. ADDITIONAL TERMS AND CONDITIONS

A. Termination

Without cause, either party to this MOU shall have the right to terminate the MOU by giving written notice to the other party of such termination at least thirty (30) calendar days before the effective date of such termination.

B. Confidentiality/HIPAA

1. Individual information: The parties agree to maintain strict confidentiality of all information received or obtained in connection with the performance of this MOU (whether or not such information involves the cooperative research) which relates to or identifies a particular research subject or any other specific individual, including but not limited to, the name, address, medical treatment, or condition, financial status, or any other personal information which is deemed to be confidential or private in accordance with applicable local, State, or Federal law (including, without limitation, the Health Insurance Portability and Accountability Act of 1996 and any regulations and official guidance thereunder) and standards of professional ethics. The parties will notify their respective employees, contractors, agents, and representatives of this confidentiality requirement and require them to maintain the confidentiality of such information.
2. KUMC shall promptly notify NHRMC IRB of any unauthorized use, loss or disclosure of individually identifiable patient or human subject information or violations of information security laws, regulations, or policies.

C. Documentation

NHRMC IRB shall maintain all documents reviewed by NHRMC IRB in connection with the cooperative research, including any communication with investigators, and make those documents available to KUMC upon request. Upon request, NHRMC IRB shall make available to KUMC all IRB minutes concerning the cooperative research. If any governmental or regulatory authority notifies NHRMC IRB that it will inspect KUMC's records, facilities, or procedures, or otherwise take action related to the cooperative research, NHRMC IRB shall promptly notify KUMC and provide KUMC with copies of any reports issued by the investigating authority, including any response by NHRMC IRB.

D. Assignment and Binding Effect

Neither party shall assign, subcontract, or transfer any of its rights or obligations under this MOU to a third party without prior written consent of the other party. If any assignment, subcontract, or transfer of rights does occur in accordance with this MOU, this MOU shall be binding upon and inure to the benefit of the parties hereto and their respective successors or assigns.

E. Independent Contractor

Each party shall be considered to be an independent party and shall not be construed to be an agent or representative of the other party, and therefore, shall have no ability to bind the other party or have any liability for the acts or omissions of the other party. In addition, neither party, nor any of its employees, agents, or subcontractors, shall be deemed to be employees or agents of the other party. Therefore, neither party nor any of its employees, agents or subcontractors, shall be entitled to compensation, workers' compensation, or employee benefits of the other party by virtue of this MOU.

F. Amendment, Modification and Waiver

This MOU shall not be altered or otherwise amended except pursuant to an agreement, in writing, signed by each of the parties. A waiver, by either party, of a breach of any provision of this MOU must be in writing and shall not operate or be construed as a waiver of any subsequent breach. The failure of a party, in any instance, to insist upon the strict performance of the terms of this MOU shall not be construed to be a waiver or relinquishment of any of the terms of this MOU, whether at the time of the party's failure to insist upon strict performance or at any time in the future, and such term or terms shall continue in full force and effect unless amended or waived in writing in accordance with this MOU.

G. Survival

The provisions of this MOU relating to confidentiality and documentation of records shall survive the termination of this MOU.

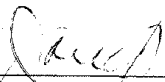
H. NHRMC IRB Contact Information for the Cooperative Research in this MOU

Amy Southerland, BS
IRB Coordinator
New Hanover Regional Medical Center Institutional Review Board
2131 S. 17th St.
Wilmington, NC 28401
Office: 910.343.4621
Fax: 910.342.3043
E-mail: amy.southerland@nhrmc.org

I. KUMC Contact Information for the Cooperative research in this MOU

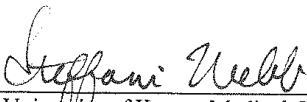
Karen Blackwell, MS, CIP
Director, Human Research Protection Programs
Mail Stop 1032, RM G006 Sudler
3901 Rainbow Boulevard
Kansas City, KS 66160
Office: 913-588-1240
Fax: (913) 588-5771
E-mail: kblackwe@kumc.edu

Approved by:



New Hanover Regional Medical Center
John K. Barto, Jr., MHSA
President and Chief Executive Officer
Institutional Official

10/23/2012 ✖
Date



The University of Kansas Medical Center
Steffani Webb, MBA
Vice Chancellor for Administration
Institutional Official

11-7-12
Date

Appendix N



November 8, 2012

Christine Hadsell, RN, MA, PhD©
3913 W. Durant Ct.
Wilmington, NC 28412

Dear Ms. Hadsell:

Study Title: Exploring Factors of Readiness to Learn about Infant Feeding in Mothers of Neonatal Intensive Care Unit Infants
IRB Study #: 1209-6

Thank you for submitting your study for review by the New Hanover Regional Medical Center Institutional Review Board. We have reviewed your study on 11/08/2012. Listed below are the actions that were taken regarding this study. If changes are required for approval, once the IRB has received the requested revisions a final approval letter will be sent to you.

This IRB operates in accordance with all applicable laws, regulations, and guidelines for research. Compliance is maintained with the FDA Code of Federal Regulations, Office for Human Research Protections (OHRP), Good Clinical Practice (GCP) guidelines, and International Conference of Harmonization (ICH).

IRB Action: Expedited

Action Item: Expedited Review Update

IRB Approval Date: 11/08/2012

Expiration Date: 9/27/2013

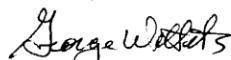
Required Changes: No modifications required.

Reason for Review: Expedited Update

Description: Request to add the Mother-Baby and Women's units to the study. Registered nurses will be recruited and trained from these additional units due to the fluctuations in the units that receive mothers of NICU infants after delivery.

If you have any questions, please feel free to contact the IRB office at 343-4621.

Sincerely,



George Willets, RPh
Chairperson, Institutional Review Board

cc: Dr. Karen Wambach, PhD, Univ. of Kansas School of Nursing

New Hanover Regional Medical Center
P.O. Box 9000 / 2131 S. 17th Street / Wilmington, NC 28402-9000
910-343-7000

Appendix O

Descriptive Information from RTL, CTF, and Anxiety Measurements

Characteristic	Response Category	Frequency/%
Maternal RTL	0 hrs	20 (100%)
RN RTL	0 hours	10 (50%)
	2-4 hours	5 (25%)
	6-12 hours	5 (25%)
Maternal CTF	0-3 Units	1 (5%)
	4-7 Units	6 (27%)
	8-10 Units	13 (68%)
RN CTF	0-3 Units	1 (5%)
	4-7 Units	8 (40%)
	8-10 Units	11 (55%)
	1-10 Units	5 (39%)
Maternal Anxiety	0-40	12 (60%)
	40-60	8 (40%)

Appendix P

Maternal Quotes from Qualitative RTL Question

What helped you to make your decision about when you will be ready?

1. "I did! I want to be as proactive and hands on as possible."
2. "Want my baby to have breast milk."
3. "Have children already."
4. "My baby. I want to be the best mother I can be so learning what ever I can is what makes me ready and also researching before I gave birth."
5. "Best for baby who really need it right know. Comfort for him."
6. "The lactation nurse had already spoken to me prior to delivery."
7. "I knew that baby had to eat."

Appendix Q

Nurse Quotes from Qualitative RTL Question

What is it about the mother that helped you to make your decision about when she will be ready to learn (e.g. maternal age, physical condition, anxiety)?

1. “Mother is very motivated to participate in infant care + this is her 2nd baby so she feels confident in feeding/caring for newborn. Mother is in early 30’s with good support.”
2. “Mother is over 20 hours out from C-section + has had lots of time to process her delivery + fact that baby is sick. She is ready to participate in care + feel a sense of bonding with infant.”
3. “She is awake, alert, pain-free, & not anxious. We actually set her up w/ a pump @ 8am, & she is effectively pumping on her own.”
4. “Previous parenting experience.”
5. “Physical condition – she was on magnesium for 24 hours after delivery and she started pumping breastmilk for her baby then.”
6. “When the mother has time to rest after infant is born.”
7. “Maternal age, # of hours since birth.”
8. “Mother emotionally stable with positive outlook on infants condition. Mother pumping on schedule & transporting EBM to NICU.”
9. “Eagerness to learn.”
10. “Mom stated she felt ready in the 1st few hrs.”
11. “Verbally stated desire.”