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NICU Nurses' Attitudes Regarding Preterm Infant Massage

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NICU Nurses' Attitudes Regarding Preterm Infant Massage

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NICU Nurses' Attitudes Regarding Preterm Infant Massage

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When preterm infants are admitted in the NICU, mothers report experiencing uncertainty; powerlessness; loss of control; role alterations; fears to hold, feed, or touch the newborn; feelings of intrusion; and alienation in the NICU. Thus, preterm birth presents a risk for the early mother-infant relationship. NICU nurses play a crucial role in facilitating bonding between parents and infants through the provision of touch and massage to provide positive experiences for the mother and infant. Because no studies were found that systematically investigated NICU nurses' attitudes regarding preterm infant massage (IM), this study was designed to explore nurses' positive and negative attitudes regarding preterm IM. An exploratory descriptive research design with an online web-based survey was used. Data were collected using the Attitudes of Infant Massage Scale (AIMS), a self-report questionnaire consisting of demographic data, benefits of, concerns with, and nurses' support for promoting IM in the NICU. Data analyses included descriptive analysis of demographic variables and instrument subscales; correlations between demographic variables (age, experience in nursing and NICU nursing) and benefits, concerns, and nurses' support; and tests of differences across demographic variables (ethnicity and education) on benefits, concerns, and nurses' support with and without controlling for age.

The findings from this study indicated strong positive attitudes regarding benefits, nurses' support, and low concerns and significant correlations between age, experience in nursing, and experience in NICU nursing and concerns, but not with benefits and nurses' support. The results affirmed that neonatal nurses have strong positive attitudes regarding benefits of and nurses' support, and very minor negative attitudes regarding concerns and issues with promoting IM in the NICU. This information is instrumental for designing an intervention whereby nurses would be willing to facilitate mother-infant attachment processes through the use of IM.

TABLE OF CONTENTS

List of Tables	xiii
List of Figures	xv
List of Abbreviations	xvi
Chapter 1: Introduction	1
Statement of the Problem	1
Background and Significance of the Problem	3
Conceptual Model	5
Factors Affecting Maternal-Infant Bonding	5
A Model of Dual Attitudes	6
Application of the Dual Attitudes Model with NICU Nurses' Attitudes	6
Definition of Key Terms and Variables	8
Statement of Research Objective	9
Specific Aims	10
Specific Aim 1	10
Research Question 1.1	10
Research Question 1.2	10
Research Question 1.3	10
Specific Aim 2	10
Research Question 2.1	10
Research Question 2.2	11
Specific Aim 3	11

Research Question 3.1	11
Research Question 3.2	11
Research Question 3.3	11
Chapter 2: Literature Review	12
Prevalence of Preterm Birth	12
Preterm Infants and Mothers' Feelings	13
Preterm Infants and Mothers' Attachment	14
NICU Environment and Mother-Infant Attachment	15
Infant Massage (IM)	17
IM Benefits Preterm Infants	19
IM and Weight Gain	19
IM and Stress Reduction	20
IM and Improved Sleep	21
IM Benefits Massage Providers	22
NICU Nurses' Attitudes towards Mother-Infant Attachment	24
Nurses Behavior and Mother-Infant Attachment in the NICU	24
Nurses' Attitudes towards IM in Promotion of Mother-Infant Attachment	25
Gaps in the Literature	27
Summary	27
Chapter 3: Research Design and Methods	28
Study Design	28
Recruitment	28

Inclusion/Exclusion Criteria.....	29
Instrument.....	29
Reliability	29
Setting.....	31
Sampling.....	32
Ethical Considerations.....	32
Data Collection.....	33
Data Analyses.....	33
Preliminary Analyses.....	33
Study Analyses.....	34
Specific Aim 1	34
Research Question 1.1	34
Research Question 1.2	34
Research Question 1.3	35
Specific Aim 2	35
Research Question 2.1	35
Research Question 2.2	35
Specific Aim 3.....	35
Research Question 3.1	36
Research Question 3.2	36
Research Question 3.3	36

Chapter 4: Results	37
Preliminary Analyses	37
Descriptive Statistics: Demographic Characteristics of Nursing Sample	37
Descriptive Statistics: Familiarity/Experience with IM	39
Descriptive Statistics: Instrument Subscales	39
Psychometric Analyses	40
Reliability	40
Factor Analysis	40
Preliminary Analyses of Study Variables	46
Nominal Variables	46
Interval Variables	48
Study Analyses	49
Specific Aim 1	49
Research Question 1.1	49
Research Question 1.2	49
Research Question 1.3	49
Specific Aim 2	50
Research Question 2.1	50
Research Question 2.2	52
Specific Aim 3	54
Research Question 3.1	54
Research Question 3.2	54

Research Question 3.3	54
Summary of Results	56
Chapter 5: Conclusions, Discussions, and Recommendations	59
Psychometric Findings	59
Dual Attitudes Model	60
Study Findings	60
Conclusions and Nursing Implications	61
Limitations and Future Study Recommendations	63
Appendix A: E-mail Invitation	65
Appendix B: The Attitudes of Infant Massage Scale (AIMS): Survey Questionnaire	67
References	70
Vita.....	84

List of Tables

Table 4.1: Descriptive Statistics: NICU Nurse Sample Characteristics	38
Table 4.2: Descriptive Statistics: Instrument Subscales	39
Table 4.3: Instrument's Reliability.....	40
Table 4.4: Principal components factor analyses with eigenvalues ≥ 1	42
Table 4.5: Varimax Factor Rotation with Four Forced Factors.....	44
Table 4.6: Varimax Rotation with Three Forced Factors	45
Table 4.7: Principal Components Factor Analysis with Three Forced Factors	46
Table 4.8: Oblimin Rotation with Three Factors	47
Table 4.9: Pearson's Correlations between age, experience in nursing, and experience in NICU nursing.....	48
Table 4.10: Descriptive Statistics for Instrument Subscales.....	51
Table 4.11: Correlation between Age, Experience in Nursing, Experience in NICU nursing and Benefits TMS, Concerns TMS, and IM Support TMS	52
Table 4.12: Pearson's correlations between benefits, concerns, and nurses' support	53
Table 4.13: Partial Correlational Analysis of TMS of benefits for infants and parents, concerns with, and IM support in promotion of IM controlling for age.....	54
Table 4.14: T-test: Differences across ethnicity on TMS of Benefits, Concerns, or Nurses' Support	55
Table 4.15: One-way ANOVA (Education-less than 4 year degree, BSN, and graduate degree and TMS of benefits, concerns, and nurses' support).....	55

Table 4.16: One-way ANCOVA: Differences across Ethnic groups, Education groups on

TMS of Benefits, Concerns, and Nurses' Support after controlling age 56

List of Figures

Figure 1.1: Dual Attitudes Model.....	7
Figure 4.1: Scree plot showing potential factors.....	42

List of Abbreviations

AIMS	Attitudes of Infant Massage Scale
ANCOVA	Analysis of Covariance
ANN	Academy of Neonatal Nursing
ANOVA	Analysis of Variance
FCC	Family Centered Care
GSBS	Graduate School of Biomedical Science
IAIM	International Association of Infant Massage
IM	Infant Massage
HHS	United States Department of Health and Human Services
IRB	Institutional Review Board
NANN	National Association of Neonatal Nurses
NICU	Neonatal Intensive Care Unit
PI	Principal Investigator
SD	Standard Deviation
SPSS	Statistical Package for the Social Sciences
TMS	Total Mean Scores
U.S.	United States of America
UTMB	University of Texas Medical Branch

Chapter 1: Introduction

This chapter identifies sources of stress for mothers of preterm infants, challenges to the mother-infant attachment process, and the role of neonatal nurses in the NICU. It describes the significance of the problem, the purpose of this study, and specific aims with research questions based on the problem.

STATEMENT OF THE PROBLEM

When a full term, normal, healthy baby is born, there is a period of adjustment in which mothers become accustomed to the new role of motherhood—a period which is facilitated by the presence of and contact with her infant. It is normal for mothers to initially feel uncertain, scared, or disconnected because of the many things needed to begin building a secure bond with the baby and to adapt to the parenthood role. The attachment bond is the resulting distinctive emotional relationship between mother and infant. While birth is generally seen as a positive experience, especially when parents are able to plan ahead, in some cases births occur earlier than expected. In these cases, adaptation becomes more stressful for mothers of preterm infants. Not only do preterm births tend to be emotionally distressing experiences for mothers, the natural bonding process between mothers and infants is often hindered, particularly when infants must be admitted to the Neonatal Intensive Care Unit (NICU) (Chia et al., 2005).

Mothers' psychological well-being is essential for the development of the mother-infant relationship (Korja et al., 2009). The Premie Help Organization (2011) indicated that 10% of preterm infants' mothers reported severe symptoms of psychological distress in the postpartum period—a rate that is five-fold the rate of term mothers. Evidence suggests that great stressors for parents of preterm infants include fears for their infants' survival, alteration of their parental role,

and separation from their infants due to hospitalization (Whittington, 2010). Mothers have reported experiencing uncertainty, powerlessness, loss of control, and role alterations; fears to hold, feed, or touch the newborn; and feelings like intruders, outsiders, and observers are in the NICU and that their infants belonged to the NICU healthcare providers (Lupon & Fenwick, 2001; Nystrom & Axelsson, 2002; Trombini et al., 2008; Wigert et al., 2006). Therefore, preterm birth presents a challenge for the early mother-infant relationship (Muller-Nix et al., 2004).

Health professionals clearly need to ensure that the mother-child separation is less traumatic. Caring not only for preterm infants but also their mothers can improve bonding, attachment, and care-giving skills in the NICU (Adene & Carin, 2006; Padovani et al., 2005). Johnson (2007) confirmed that nurses have a unique opportunity to help mothers experience meaningful motherhood in NICU settings.

Neonatal nurses face unexpected difficulties and challenges in upholding their professionally defined roles in the NICU while understanding and examining parents' experiences to meet their needs and concerns (Gallagher et al., 2012; Obeidat et al., 2009; Padovani et al., 2005). NICU nurses are faced with providing care to high risk and highly vulnerable patients who are often dependent on various life support technologies and medical protocols (National Association of Neonatal Nurses [NANN], 2001). Concerns for the welfare of these infants often fosters protective and conservative attitudes towards innovative interventions designed to address issues not immediately salient to infant survival (McGrath, 2008). Thus, nursing staff members' need to foster greater parental interaction with preterm infants is often experienced as putting the infant at greater risk as well as requiring greater staff time commitments (Chia et al., 2005). Acceptability of proposed NICU nursing staff interventions must address both these areas of concern to be successful. Ginsburg (2007) suggested that

providing mothers with increased opportunities to participate in their infants' care through provision of touch and massage could provide positive experiences for mothers and infants and improve infant developmental outcomes. Neonatal nurses are infants' primary care providers and positioned to support or discourage the use of infant massage (IM) in the NICU. Because nurses' attitudes, behaviors, and practices greatly impact mothers' experiences in the NICU (Fenwick et al., 2001b), exploring the attitudes of nurses towards IM is highly relevant because they are the major determinants in creating positive parental experiences towards IM of their preterm infants.

To date, no research had systematically examined the attitudes of U.S. neonatal nurses regarding preterm IM in the NICU. Therefore, this study's aim was to explore neonatal nurses' attitudes regarding preterm IM and define their perceptions regarding the benefits of, concerns, and issues with, and support in promoting IM for preterm infants in the NICU.

BACKGROUND AND SIGNIFICANCE OF THE PROBLEM

The literature has indicated that mothers of preterm infants exhibit emotional distress, and that this distress negatively impacts the mother-infant relationship during their infants' time in the NICU. Fears about the uncertain condition of their preterm infants and feelings of a lack of confidence and skill in touching and holding their infants in the NICU are barriers to maternal development of positive relationships with their prematurely born infants. Taking care of the mother and mitigating negative effects of any distressful emotional experience are very important, both for the mental health of the mother and development of her child as well as for the economic and social impact on society (Correia & Linhares, 2007; Rosand et al., 2011; World Health Organization [WHO], 2008).

Encouraging early contact between mothers and preterm infants is essential to minimize impacts of immediate negative consequences of infants' preterm birth and hospitalization. Short-

terms problems may center on bonding and attachment, lack of parenting confidence, and decreased maternal care-giving skills (Loo et al., 2003); long-term negative consequences of a lack of parental involvement may include neglect, abuse, and other parenting problems (Raines, 1998).

Nurses have an influential role in infants' future development, as they are catalysts in the bonding relationship between infants and parents (Whittington, 2010). Although interventions may reduce mothers' level of anxiety and enhance the skills and confidence of mothers in caring for preterm infants (Warren, 2005), nurses working in NICU need to construct nursing care around the mother-infant dyad, with roles and responsibilities that incorporate mother-infant and mother-nurse relationships in support of the mother-infant attachment process (Kearvell & Grant, 2008). According to Browne (2004), one viable approach is through the use of preterm IM as part of Family Centered Care (FCC) in the NICU, in which the mothers are empowered to interact with their premature infants and cope with the experience of having a preterm hospitalized infant. Thus, performing massage for preterm infants may result in reduced anxiety levels and help to increase other positive maternal outcomes such as mothers' attachment and role attainment levels. These acts may, in turn, prevent substantial emotional burdens on families and society (WHO, 2008).

Nursing behaviors are essential in facilitating the mothering role with FCC. FCC allows for flexibility in routines and procedures to accommodate families' needs. When FCC practices are implemented, parents are not seen as outsiders but rather members of the team (Griffin, 2006). Preterm IM causes mothers to touch, hold, and contain their infants, which may enhance mothers' skills in attaching to their infants and acquiring competence in care-taking tasks (Mercer, 2004).

Positive attitudes of nurses towards preterm IM may determine positive experiences of parents in the NICU by improving bonding and attachment between mothers and infants. Positive maternal outcomes can significantly impact short-term and long-term benefits for mothers, children, family, and society (WHO, 2008). The current study helped to clarify perceptions in favor and against promoting IM for preterm infants in the NICU. Understanding NICU nurses' attitudes regarding preterm IM provided critical information for designing an effective therapeutic program by which nurses could facilitate the attachment process through promotion of early parent-infant contact. The development of effective interventions that consider both providers' and patients' concerns and needs could lead to changes in more effective hospital practice and policies. Findings generated from this study have added to the knowledge base used by nurses in enhancing family centered care during infants' stay in the NICU.

CONCEPTUAL MODEL

Factors Affecting Maternal-Infant Bonding

Although the literature reflects that IM has many benefits, the practice is not widespread in NICUs and should be encouraged. It is clear that parents of premature infants are often distressed and overwhelmed when their infants are admitted in the NICU. NICU nurse support can help to dispel parents' concerns about attachment with their infants. Factors that affect maternal-infant bonding include: 1) NICU factors such as the admission of preterm infant in the NICU, the NICU environment itself, the technology involved, the appearance of the infant, and maternal-infant separation; and 2) provider factors such as NICU nurses' negative attitudes towards Family-Centered Care (FCC), workload, time demands, concerns with safety of the infant, and control over infant. As care providers of preterm infants, neonatal nurses' attitudes

and beliefs play a major role in encouraging parents to touch and massage their preterm infants in the NICU to facilitate maternal-infant bonding. An assumption has been that if nurses had positive attitudes of neonatal massage, they would be more willing to involve and empower mothers to gain confidence in using IM in the NICU. In many ways, the attitudes of NICU nurses may be the most important factor in determining positive mother-infant relationships in the NICU.

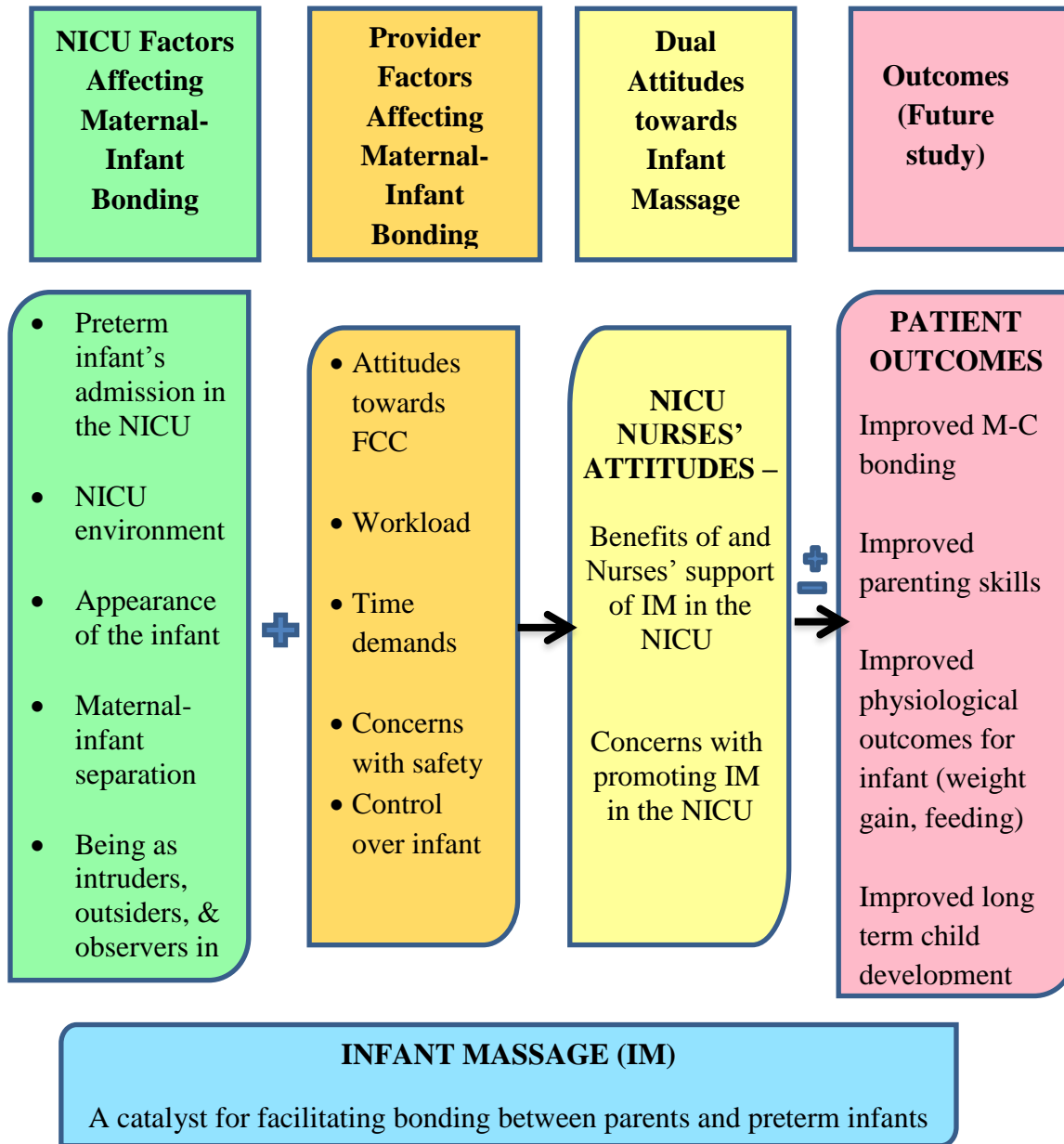
A Model of Dual Attitudes

The Model of Dual Attitudes (Wilson et al., 2000) served as a guide for this study (Figure 1). The Dual Attitude Model is a socio-psychological model proposing that people can hold negative and positive attitudes about the same thing. That is, their attitudes are not two ends of a continuum but independent dimensions. However, identifying which attitude makes the most difference in the way people act is essential to understanding ways in which to change behaviors. Wilson et al. (2000) suggested that strong positive attitudes may make a bigger difference in changes in behavior than strong negative attitudes. In other cases, strong negative attitudes make more of a difference in behavior than positive attitudes. In either case, increasing the dimension that is most important for that particular issue will result in a more substantial behavioral change. Cacioppo et al. (1997) stated that dual attitudes occur when people have different evaluations of the same attitude in memory.

Application of the Dual Attitudes Model with NICU Nurses' Attitudes (Figure 1. 1)

The Dual Attitude Model implies that dual attitudes may be held by NICU nurses (i.e., positive beliefs about the benefits of IM alongside concerns [negative attitudes] regarding some aspects IM), which may impact whether they behaviorally embrace IM in the NICU.

Figure 1.1: Dual Attitudes Model



NOTE: + REPRESENTS A POSITIVE RESULT (HIGH ON BENEFITS/SUPPORT OF IM; LOW ON CONCERNS) & - REPRESENTS A NEGATIVE RESULT (LOW ON BENEFITS/SUPPORT; HIGH ON CONCERNS)

Thus, the model can account for the fact that supportive perceptions of IM can be gained automatically from formal education and training or through personal experiences with IM, while less supportive attitudes (concerns with promoting IM) can be generated from other sources (e.g., NICU environment, hospital policies). Even though nurses may have strong attitudes on the benefits and usage of IM for preterm infants, sometimes their strong negative attitudes (concerns with promoting IM) may hinder the usage of IM in the NICU. Cacioppo et al. (1997) found that if people have strong positive attitudes about something, they may be willing to act on those attitudes, even if they also hold strong negative feelings.

Application of the Dual Attitude Model implied that NICU nurses could exhibit dual attitudes, and that those with positive attitudes supported the use of IM even if they had concerns about IM promotion. Thus, the goal of this pilot study was to identify the positive attitudes (belief in benefits and support for IM) and negative attitudes (concerns with promoting IM) of NICU nurses in promoting IM in the NICU. Based on study findings, future work can evaluate whether increasing the perceived benefits or reducing the perceived concerns would be most effective to increase use of IM for short- and long-term outcomes.

DEFINITION OF KEY TERMS AND VARIABLES

The following definitions of key terms and variables were used for this study.

Infant Massage (IM): IM is the process of gently rubbing an infant's muscles and stroking the infant in a manner specifically designed for them (McClure, 2000). According to Modrcin-McCarthy et al. (1997a) IM is a type of touch that implies the systematic manual or mechanical manipulation of the soft tissues of the body.

Neonatal Intensive Care Unit (NICU): NICU is an intensive care unit that uses advanced technology and trained health professionals to provide special care for ill, pre-term, and post-term newborn infants.

NICU Nurses' Attitudes: NICU nurses' attitudes are predispositions or tendencies to respond positively or negatively regarding IM measured by a self-report questionnaire (Attitudes of Infant Massage Scale [AIMS]), comprised of benefits of IM (15 items for infants and nine items for parents), concerns with IM (11 items), and nurses' support (four items) in promoting IM for preterm infants in the NICU.

Attachment: Attachment refers to the distinctive emotional connection between a mother and her infant.

Family centered care (FCC): FCC is a mutually beneficial partnership among NICU nurses, families, and preterm infants that recognizes the importance of the family in the NICU setting.

Preterm Infant: Premature birth is defined as childbirth occurring at less than 37 completed weeks (Centers for Disease Control and Prevention [CDC], 2013).

STATEMENT OF RESEARCH OBJECTIVE

The purpose of the study was to explore neonatal nurses' attitudes regarding preterm IM to identify their concerns and supportive perceptions that might impact nursing support and promotion of a massage procedure for preterm infants in the NICU. Identification of these concerns and issues and supportive perceptions would be instrumental in designing an intervention that would be enthusiastically embraced by nursing staff and parents. The following specific aims and research questions were addressed to explore neonatal nurses' attitudes regarding preterm IM.

SPECIFIC AIMS

Specific Aim 1

Explore neonatal nurses' attitudes regarding the benefits of, concerns with, and nurses' support for promoting IM for preterm infants in the NICU.

RESEARCH QUESTION 1.1

What do neonatal nurses perceive regarding the benefits of promoting IM for preterm infants and parents in the NICU?

RESEARCH QUESTION 1.2

What are the neonatal nurses' concerns and issues with promoting IM for preterm infants in the NICU?

RESEARCH QUESTION 1.3

To what extent do NICU nurses indicate support for promoting IM for preterm infants in the NICU?

Specific Aim 2

Identify relationships between demographic variables (age, years in nursing practice, and years in NICU practice) and benefits for infants and parents, concerns, and nurses' support regarding IM for preterm infants.

RESEARCH QUESTION 2.1

What are the relationships between age, years in nursing practice, years in NICU practice and benefits for infants and parents, concerns, and nurses' support?

RESEARCH QUESTION 2.2

What are the relationship between perceptions of benefit for infants and parents, concerns with promotion of IM, and nurses' support with and without controlling for appropriate demographic variables?

Specific Aim 3

Identify the differences across demographic groups (ethnicity and education) on the attitudes of NICU nurses regarding IM for preterm infants.

RESEARCH QUESTION 3.1

What are the differences across demographic groups (ethnicity and education) regarding perceived benefits of IM for infants and parents for promoting IM for preterm infants in the NICU controlling for age, if appropriate?

RESEARCH QUESTION 3.2

What are the differences across demographic groups (ethnicity and education) regarding concerns and issues with promoting IM for preterm infants in the NICU controlling for age, if appropriate?

RESEARCH QUESTION 3.3

What are the differences across demographic groups (ethnicity and education) regarding nurses' support for preterm infants in the NICU controlling for age, if appropriate?

Chapter 2: Literature Review

This chapter presents the recent statistics regarding preterm births and preterm infant admission in the NICU, the scientific literature regarding the impact of preterm birth on parental bonding, and findings regarding the impact of nursing behaviors that enhance and hamper mother-infant attachment. This chapter also explores IM, benefits of IM for parents and infants, and current literature on nurses' attitudes towards IM in improvement of mother-infant attachment.

PREVALENCE OF PRETERM BIRTH

Preterm birth is the birth of an infant prior to 37 weeks of pregnancy (Centers for Disease Control and Prevention [CDC], 2013). WHO (2013) estimated that out of the 135 million live births worldwide in 2010, about 14.9 million infants were born preterm, representing a rate of 11.1% (Blencowe et al., 2012). An estimated 500,000 infants, 1 in 9 infants, are born prematurely annually in the U.S. (March of Dimes, 2014). Across 184 countries, the rate of preterm birth ranges from 5% to 18% of infants born (WHO, 2013). WHO (2013) generally reports data on three categories of preterm birth: moderate to late preterm (32 to <37 weeks gestation), very preterm (28 to <32 weeks gestation), and extremely preterm births (<28 weeks gestation). The March of Dimes partnered with the National Perinatal Information Center/Quality Analytic Services (NPIC/QAS) to describe special care nursery admissions from July 2009 to June 2010. This report revealed that more than 90% of infants less than 34 weeks gestation were admitted in the NICU, compared to almost half of late preterm. Among all special care admissions, 49.1% were preterm (<37 weeks gestation) of which 10.6% were 32-33 weeks gestation and 25.9% were 34-36 weeks (March of Dimes Perinatal Data Center, 2011).

PRETERM INFANTS AND MOTHERS' FEELINGS

The period immediately following a preterm birth is typically referred to as a time of crisis for the family, especially mothers (Davis et al., 2008). Research studies have documented that mothers of preterm infants are at greater risk of psychological distress than mothers of full-term infants and in the early postpartum period (Davis et al., 2008; Feijo et al., 2006; Hamilton et al., 2008; Holditch-Davis et al., 2003; Padovani et al., 2005; Taubman–Ben-Ari & Findler, 2010). It has been estimated that 28-70% of mothers of premature infants have shown clinically significant degrees of psychological distress (Davis et al., 2008). Mothers of preterm infants are more likely to show symptoms of anxiety and depression than fathers (Doering et al., 2000; Zanardo & Freato, 2001).

Many qualitative studies and reviews of literature have been conducted to investigate the experiences of parents of preterm infants hospitalized in the NICU. Hotditch-Davis & Miles (2000) conducted a study with 31 American mothers of preterm infants and identified a number of sources of stress in the NICU such as preexisting and concurrent family factors, prenatal and perinatal experiences, infants' illness, treatments and appearance of the infant, concerns about outcome, loss of parental role, and behavior of health care providers. Jackson et al. (2003) conducted a phenomenological hermeneutic study to investigate the experiences of seven Swedish mothers and fathers of preterm infants and found that parents' experience in the NICU was a process in which they transitioned from feelings of alienation and responsibility to familiarity and confidence. Aagaard and Hall (2003) concluded from 14 meta-analyses that giving birth to a preterm baby produces feelings of alienation, despair, and grief. Trombini et al. (2008) stated that these high stress levels may alter a mother's interaction with her baby and impair her communication with health professionals.

PRETERM INFANTS AND MOTHERS' ATTACHMENT

In maternal-newborn healthcare, attachment refers to the emotional connection between a mother and her infant. Nurses can assess attachment behaviors by observing interactions between mothers and infants (Derricott, 2010). Mothers' behaviors that indicate positive attachment include touching, holding, kissing, cuddling, talking and singing, choosing the "en face" position, and expressing pride in the infant (Derricott, 2010). A positive parent-infant relationship is critical for the promotion of optimal child development. The World Health Organization (WHO) (2008) has identified maternal-infant bonding and attachment as important factors in promoting optimal infant growth and development and facilitating the infant's later socio-emotional, behavioral, and cognitive development in addition to being related to the physical health of the child (WHO, 2008).

Some factors that interrupt the maternal-infant attachment process are unique to prematurity, particularly when the infant is admitted in the NICU (Chia et al., 2005). Such factors include mothers' traumatic experience of pregnancy; mothers' preterm birth experience; early maternal-infant separation; maternal fear for the infant's safety in the NICU, the NICU environment, technology, appearance and behaviors of the preterm infant; the infant's poor physical condition; and the feelings of loss of the parental role, and maternal anxiety may complicate the mother's attachment process (De Rouck & Leys, 2009; Korja et al., 2009; Lupton & Fenwick, 2001; Melnyk et al., 2001; Muller-Nix et al., 2004; Schmucker et al., 2005). Early separation of the infant from parents increases strain on the infant-parent relationship (Obeidat et al., 2009). This stressful situation increases the risk for maternal depression and anxiety, which may negatively affect the mother-infant relationship (Davis et al., 2008; Korja et al., 2009). These early problems may contribute to prolonged difficulties with parenting and place

premature infants at risk for further cognitive, emotional, behavioral, and developmental problems (WHO, 1997). Brisch et al. (2005)'s case study concluded that a preterm infant developed neurological impairments due to insecure attachment.

Mothers need to see, hold, and touch their preterm infants to facilitate early attachment and bonding (Hall, 2005). Roller (2005) conducted a transcendental phenomenological study to find the experiences of 10 American mothers of preterm infants who were admitted in the NICU. The researchers found that mothers had a strong desire to be close and get to know their infants. Erlandsson and Fagerberg (2005) conducted a qualitative study using a Husserlian Phenomenological approach and found the experiences of six Swedish mothers of preterm or sick full-term infants in the NICU were characterized by an inability to be close to their infants, an inability to be seen, and an inability to be a part of a functional team. Browne and Talmi (2005) found that implementing family-based interventions, such as IM, for parents of preterm infants in the NICU enhanced parental knowledge and sensitivity, and decreased stress.

NICU ENVIRONMENT AND MOTHER-INFANT ATTACHMENT

Research has demonstrated that the process of establishing parent and infant attachment in the NICU is highly individualized and complex (Lutz et al., 2009). Preterm infant admission to the NICU can interrupt the mother-infant attachment process because mothers initiate their motherhood in an unacquainted and intimidating environment (Ramona & Walker, 2006; Shin & White-Traut, 2007). Research studies have identified factors affecting mother-infant relationship in the NICU, which included mothers' inability to hold, touch, or care for their infants and infants' appearance; health condition of the infant; mothers' concerns about infants' outcome; poor relationship between nurses and mothers; stressful NICU environment with unfamiliar sights and sounds; and medical interventions in the NICU that diminish mother-infant contact

time (Ann et al., 2010; Fenwick et al., 2001a; Flacking et al., 2006; Holditch-Davis & Miles, 2000; Jackson et al., 2003; Johnson, 2007; Lundqvist et al., 2003; Neu, 2004). Lundqvist et al. (2007) conducted a qualitative study to examine fathers' perspectives of caring for preterm infants and documented that the NICU environment was a main barrier for the bonding process. Nystrom and Axelsson (2002) conducted a phenomenologic-hermeneutic approach of eight mothers' narratives, which revealed that feeling like an outsider and lack of control over their infants in the NICU was related to separation from their infants.

Hurst (2001) conducted a qualitative study using critical ethnography that explored the experiences of 12 mothers of preterm infants in the NICU. This study used participant observation to observe mothers' actions in the NICU. This study concluded that mothers vigilantly watched over their infants in the NICU and suggested that nurses often interpreted mothers' actions differently than intended, which created barriers to achieving family-centered care in the NICU. Reid et al.'s (2007) extensive literature review indicated that poor nurse-parent interaction was a barrier in FCC, creating conditions whereby parents were hesitant to ask for information from nurses (Kenner & McGrath, 2004). Johnson (2008) demonstrated that when nurses were busy providing care for the preterm infants, mothers were often left to struggle with limitations in their maternal roles.

Research studies have indicated that nurses who engaged in supportive behaviors such as providing adequate information and communication and in helpful and non-judgmental relationships with parents influenced the positive parent-infant relationship in the NICU (Heerman et al., 2005). Holditch-Davis & Miles (2000) demonstrated that NICU factors such as sufficient space available for families, health professionals' support, and positive attitudes towards FCC created unique settings for the development of healthy attachments between

parents and infants. Nurses and other health professionals need to be responsible for the care of preterm infants and their mothers in the NICU (Mok & Leung, 2006; Padovani et al., 2005).

INFANT MASSAGE (IM)

Modrcin-McCarthy et al. (1997a) described IM as a type of touch that implies the systematic manual or mechanical manipulation of the soft tissues of the body. In fact, touching is the first act of communication between parents and infants (Askin & Wilson, 2007). Studies have described various types of touch that occur in the NICU: gentle human touch, negative touch associated with intensive care procedures, stroking, poking, and tactile/kinesthetic touch (Hernandez-Reif et al., 2007; Hertenstein, 2002; Modrcin-McCarthy et al., 1997b; Pelaez-Nogueras et al., 1997). The word massage infers rubbing or kneading the skin with the hands to stimulate or manipulate. Massage strokes should only be initiated when babies show signs of being able to tolerate positive still touch, i.e., without displaying behavioral and physiological instability (Bond, 2002). Massaging infants' skin enhances and improves communication between infants' brains and bodies. This skin stimulation is transmitted to the brain, which regulates our body systems via the vegus nerve; this nerve branches out to the circulatory, respiratory, and digestive systems. IM is an inexpensive tool and key to building the foundation in which human qualities are found: validation, safety, trust, security, mutual respect, healthy communication, and high self-esteem (Reese, 2012).

Johnson (2008) stated that IM contained critical elements of positive attachment such as eye-to-eye contact, smiling, soothing vocal sounds, loving touch, caressing, smell, and mutual interaction. Conversely, touch with premature infants is often limited due to fear of overstimulation in the NICU (Whittington, 2010). Light/feathery touch has been found to be over-stimulating and irritating to infants (Bond, 2009). Field et al. (2006) conducted a survey to

determine types of stimulation on neonates in the NICU in the U.S. and reported that 86% of NICUs practiced a minimal touch policy in order to minimize overstimulation and only 38% of NICUs in the U.S. practiced preterm IM. Kulkarni et al. (2010) demonstrated that a minimal touch policy was commonly practiced to reduce the possible risk of infection in preterm infants, thus supporting limited touch in the NICU. However, there are few criticisms regarding positives and negatives of IM because there was no research for exploring a proper methods of using IM. Long et al. (1980) conducted a study to experiment on the effects of excessive handling on neonates, found that daily procedures such as feeding, examinations, and diaper changes were associated with hypoxemia, and concluded that neonates who were handled less had less hypoxemia. They recommended that nurses need to be instructed to touch and handle the neonates as little as possible. Conversely, White-Trout et al. (1988) explored the safety of massage touch on the neonates and found that massage is a safe practice. Safety of massage includes changes in body temperature, heart rate, and respiratory rate were all within an acceptable clinical range for preterm infants.

Vickers et al. (2004) stated that although massage can be defined as any form of systematic tactile stimulation by human hands, the type of massage typically used in neonatal care is a gentle, slow stroking of each part of the body in turn. Scafidi et al. (1986) described massage as the infant being placed in a prone position and being stroked:

“For 1 min periods (12 strokes at approximately 5 seconds per stroking motion) over each region in the following sequence: (1) from the infant’s head and face to the neck; (2) from the neck across the shoulders; (3) from the upper back to the waist; (4) from the thigh to the foot to the thigh on both legs and (5) from the shoulder to the hand to the shoulder on both arms” (Vickers et al., 2004).

Massage is often combined with other forms of stimulation such as rocking, kinesthetic stimulation (e.g., passive extension/flexion movements of the arms and legs), talking, or eye contact. When IM is performed, oxytocin, an anti-stress hormone also called the “Love Hormone,” is released. This release, in turn, provides relaxation, encourages bonding between mother and infant, and lowers cortisol—a stress hormone (Reese, 2012).

IM BENEFITS PRETERM INFANTS

Research studies have suggested that massage has several positive effects on infants in terms of increased weight gain, shorter hospital stay, better sleep-wake pattern, better maternal-infant attachment and interaction, lower maternal stress and anxiety, and lower rates of nosocomial infection (Vickers et al., 2004; Underdown et al., 2006; Dieter et al., 2003).

IM and Weight Gain

Because weight gain is a principal criterion for preterm infant hospital discharge, research studies have been conducted to determine the relationship between IM and preterm infant weight gain. Preterm infants who received massages not only showed greater weight gain but also a greater increase in serum insulin and IGF-1 levels, increases temperature in preterm infants, and earlier hospital discharge (Field et al., 2004b, 2008, 2011). Field et al. (2008) conducted a study to determine whether massage increased serum insulin and insulin-like growth factor-1 (IGF-1) in preterm neonates. Forty-two preterm neonates who averaged 34.6 weeks (mean = 29.5 weeks gestational age; mean birth weight = 1,237 g) and were in the step-down nursery were randomly assigned to a massage therapy group (body stroking and passive limb movements for three 15-minute periods per day for five days) or a control group that received the standard nursery care without massage therapy. On days one and five, the serum collected by

clinical heel stick was assayed for insulin and IGF-1, and weight gain and kilocalories consumed were recorded. The results demonstrated that massaged preterm infants showed greater increase during the five day period in weight gain, serum levels of insulin, and IGF-1.

Randomized Controlled Trials (RCT) have found that preterm infants who received 5-10 days of massage showed a 21-48% greater increase in weight gain and hospital stays of three to six days fewer than control infants (Diego et al., 2005; Field et al., 2004a). Dieter et al. (2003) concluded from their RCT study that preterm infants receiving massage for five days gained 48% more weight than control infants. Gonzalez et al. (2009) conducted a randomized control trial where parents performed Vimala massage on their clinically stable preterm infants (N=60) twice daily for 10 days along with standard nursery care. The researchers documented that infants receiving massage had greater weight gain (188.2 ± 41.20 g/kg) compared to the control group (146.7 ± 56.43 g/kg, $P < 0.001$) and shorter hospital stay (15.63 ± 5.41 days) compared to the control group (19.33 ± 7.92 days).

IM maintains temperature for preterm infants who are in NICU incubators. Diego et al. (2008) conducted a RCT to assess whether temperature increases in preterm infants after massage. Seventy-two preterm infants were randomly assigned to control or massage therapy groups. Infants in the massage group who received 15 minutes massage with open incubator portholes had a greater increase in temperature compared to the control group. Results indicated that heat loss did not occur in preterm infants receiving massage therapy in incubators, and suggested that this procedure was safe for use in preterm infants living in incubators.

IM and Stress Reduction

Massage can be prescribed for all growing neonates (Field et al., 2005) and has been shown to help infants decrease stress behaviors and activities. Moderate pressure massage is

more relaxing for the preterm infant and less arousing compared to light pressure (Bond, 2002). Field et al. (2006) examined whether moderate versus light pressure massage contributes to greater weight gain in preterm infants. Sixty-eight preterm infants (mean gestational age 30 weeks) were randomly assigned to moderate or light pressure massage groups, receiving 15 minutes massage three times per day for 5 days. The moderate pressure massage group gained significantly more weight per day, showed a smaller decrease in deep sleep, a greater decrease in heart rate, and a greater decrease in vagal tone. Therefore, the moderate pressure massage group appeared to be more relaxed and less aroused than the light pressure massage group. Hernandez-Reif et al. (2007) conducted a study using experimental (massage therapy group) and control groups to investigate the effectiveness of IM on changes in stress behavior of the infants, which included sneezing, crying, grimacing, yawning, jerking of limbs, and finger flaring. The preterm infants in the massage therapy group received three 15-minute massages each day for five consecutive days, with the massages consisting of moderate pressure stroking to the head, shoulders, back, arms, and legs and kinesthetic exercises consisting of flexion and extension of the limbs. The findings suggest that massage has pacifying or stress reducing effects on preterm infants that could benefit their health and reduce their length of time in the NICU.

IM and Improved Sleep

Sleep/wake habits are important to infant development, with decreased sleep time being a sign of positive growth and development. Dieter et al. (2003) conducted a study to explore the sleep/wake behaviors of massaged infants and found that experimental groups (massaged infants) slept less than the control groups and showed normal premature sleep patterns. Massage of full-term infants has improved sleep and orientation as well as reduced excitability (Field, et al., 2004a). In Russia, Kelmanson and Adulas (2006) found that low birth weight preterm infants

who received massage from two to eight months were less likely to snore during sleep, required less feeding on waking-up at night, and appeared more alert during the day.

IM BENEFITS MASSAGE PROVIDERS

Parents have limited access to their preterm infants in the NICU, and consequently feel isolated from their infants and experience a significant emotional distress. Parents also feel anxious about handling their medically fragile infants. Preterm IM can enhance positive mother-infant attachment and build mothers' confidence in their new role of caring for a preterm infant in the NICU environment.

The literature has indicated that there are several benefits not only for the infants who receive massage but also for the mothers who provide massage, including improved mood. Reese (2012) stated that hormones are released in mothers that cause them to “fall all over in love” with their infants, alleviate post-natal depression, and generally improve the mother-infant bond. Feijo and Piccinini (1998) reported that mothers who massaged their preterm infants felt closer to their infants, were less fearful of handling and touching them, and felt less guilty about their infants' preterm status. Feijo et al. (2006) conducted a RCT with 40 mothers of preterm infants who were in the NICU. Mothers were divided into two groups: massage group as performers of IM and control group as observers of IM. After the researchers demonstrated massage on preterm infants for four minutes to the massage group, mothers performed massage for four minutes. The results showed that both groups of mothers had lower depressed mood scores but only the massage group had lower maternal state anxiety scores following the session ($F(1, 38) = 10.36, p < .01$). Field et al. (1998) conducted a study on elderly depressed individuals, who massaged infants at a nursery school for three weeks, three times per week. The results showed that immediately after first and last day sessions of giving massages, elderly participants had lower levels of anxiety

and depression and lower stress hormones (salivary cortisol) levels. Over a three-week period, their lifestyle and health had improved.

Mothers' massage experiences have been shown to improve parent-infant relationships (Stewart-Brown & Schrader-Mcmillan, 2011). Goldstein-Ferber et al. (2005) concluded that mothers who massaged their three-month-old preterm infants reported less depressed mood and had improved mother-infant interactions. Similarly, Onozawa et al. (2001) investigated whether IM improves mother-infant interaction for mothers with postnatal depression. Thirty-four primiparous depressed mothers were divided into massage and control groups. Both groups attended five weekly sessions. The study found EPDS (Edinburgh Postnatal Depression Scale) scores lowered in both groups and mother-infant interaction improved.

Vickers et al. (2004) conducted a research study on massage intervention for promoting growth and development of preterm infants, finding that massage decreased stress and provided tactile stimulation for the infants. The researchers recommended that future studies should assess the effects of massage interventions on clinical outcome measures, such as medical complications or length of stay, and on process-of-care outcomes, such as caregiver or parental satisfaction. Ferber et al. (2002) conducted a study to compare the improvement of mother-infant interactions massage therapy by mothers and trained professionals and to replicate the results of increased weight gain in preterm infants. The result showed that mothers were able to achieve the same effect size as that of trained professionals, allowing cost-effective application of the treatment within the NICU.

Although there have been significant benefits of IM for massage providers (mothers) and massage receivers (infants) in the NICU setting, Beachy (2003) stated that nurses have been hesitant to begin massage for a fear of over-stimulating the infant. When IM is properly applied

to preterm infants they respond positively with increased weight gain, improved developmental scores, and earlier hospital discharge. Parents also benefit because IM enhances bonding with their infant, and increases confidence in their confidence in their parenting skills (Beachy, 2003).

NICU NURSES' ATTITUDES TOWARDS MOTHER-INFANT ATTACHMENT

Nurses Behavior and Mother-Infant Attachment in the NICU

Nurses play a crucial role in facilitating bonding between parents and infants by encouraging their interactions (Chia et al., 2005; Whittington, 2010). Kearval and Grant (2008) described the process by which the NICU environment and nursing staff can restrict the natural process of attachment for many mothers and infants. The mother-infant attachment process can be highly influenced by mother-infant and mother-nurse interactions. Johnson (2007) conducted a systematic review of six studies and concluded that nurses who encouraged mothers' nurturing actions and contact such as touching, talking, singing, comforting, feeding, and responding to behavioral cues were found to be central in the establishment of mother-infant attachment.

In Australia, Fenwick et al. (2001a) conducted a study to investigate the experiences of mothers of preterm infants who were in the NICU. The researchers found that nurses' language and chatting were powerful tools that could be used to encourage parents to develop confidence in taking care of their preterm infants. Hall (2005) used a phenomenological approach with seven sets of Danish parents to detail their experiences in the NICU. The researchers noted that parents generally viewed nurses as kind, helpful, informative, and capable; they were prominent and made the parents feel safe and secure as well as proud of their infant. Fenwick et al. (2008) identified a positive and shared attitude of nurses as being critical to involving mothers in their infants' care in the NICU, which in turn enabled mothers to establish positive attachment with their infants. Additionally, Wigert et al. (2006) stated that the mother-nurse relationship was a

dynamic force in supporting mothers' establishment of a connection with their infants. This statement was further supported by Karl et al. (2006), who reiterated that mothers who experienced positive relationships with nurses were more likely to build a positive and connected relationship with their infant.

Flacking et al. (2006) studied 25 Swedish mothers of infants in the NICU and found that nurses who were supportive and nonjudgmental were able to develop trustful staff-mother relationships and enhance mothers' self-esteem. Cleveland (2008) reported that nursing behaviors critical to meet parents' needs were providing emotional support, empowering parents, providing a healthy NICU environment, and encouraging parents to participate in the infants' care.

Open communication is considered a fundamental principle to successful family centered care but can be a major challenge for mothers and nurses within the NICU environment (Johnson, 2008). FCC practices promote touch as a catalyst for facilitating bonding between parents and their preemies (Kenner & McGrath, 2004). Berlin et al. (2006) found that a majority of nurses experienced difficulties in communicating with parents of foreign origin. Obeidat et al. (2009) concluded that nurses played a major role in encouraging parents during the stressful, challenging experience of the NICU by developing therapeutic relationships, providing emotional support, providing parents with accurate and clear information, and involving parents in providing care for their infants. These approaches enable parents to feel more supported, more involved, and more confident and effective as caregivers to their vulnerable newborn.

NURSES' ATTITUDES TOWARDS IM IN PROMOTION OF MOTHER-INFANT ATTACHMENT

The literature has indicated that positive human touch and massage are safe when properly applied and have statistically significant benefits for infants and mothers (McGrath,

2009). Leonard (2009) argued that by implementing a minimal touch policy, hospitals assumed that no risks were taken at the health of the infant.

However, when a proper method of IM using moderate pressure has been performed, the benefits are overwhelmingly high and risks minimal (Beachy, 2003; Field et al., 2006; Leonard, 2009). Fenwick et al. (2001a) found that NICU nurses more often focus only on meeting the medical and technological needs of infants rather than on building positive interactions between parents and infants. In a qualitative study on parents' perspective of touch, Kenner and McGrath (2004) reported that neonatal nurses may face other practical difficulties in implementing or empowering mothers to touch and massage their infants in the NICU due to lack of knowledge and skills, lack of time, or staff shortages.

In addition to existing negative attitudes held by neonatal staff regarding FCC practices, the demand of a highly advanced technological NICU environment, nurses' busy schedules, and maternal fear in handling and massaging their infants may also contribute to nursing concerns (Browne, 2004). Harrison (2004) stated that nurses spent the majority of time providing basic care such as feeding, changing, bathing, and taking vital signs, or providing high level care such as respiratory care or needle sticks. As nurses have assumed key roles in patient advocacy and directing patient care (Finkelman, 2012), they have become logical resources to empower mothers to implement neonatal massage in the NICU. Flacking et al.'s (2006) study highlighted that nurses have the authority to reject or include mothers in neonatal care and are crucial in assisting mothers to become involved and develop mother-infant bonds. Pretorius (2008) documented that nurses frequently ignore parents' right and need to touch their preterm infants while allowing themselves the right to massage the preterm infants. Hence, the attitude of NICU

nurses towards IM is a major determining factor in maintaining maternal-child bonding in the NICU (Whittington, 2010).

GAPS IN THE LITERATURE

An extensive review of the literature showed a lack of information about the attitudes of NICU nurses towards IM for facilitation of maternal-infant attachment. However, research studies that have examined nurses' attitudes in facilitating bonding between mother and infant from the parent's perspectives have reported many barriers involving the nurses in the NICU that hinder positive mother-infant attachment (Kenner & McGrath, 2004; Whittington, 2010). This study was aimed at filling this gap in the literature by exploring neonatal nurses' attitudes regarding the use of IM for preterm infants in the NICU to facilitate maternal-infant attachment.

SUMMARY

Once preterm infants are admitted in the NICU, separation between infant and mother occurs, in turn affecting mother and infant behavior as well as the quality of infant-mother interactions. As providers, NICU nurses are critical to ensuring the process of mother-infant bonding. Massage, a non-invasive and non-medical technique, is deemed to be developmentally appropriate and part of family centered care in the NICU. When parents are taught and allowed to touch their infants appropriately, it can enhance the bonding process of parents becoming acquainted with their infants. Although there are benefits of IM for infants, mothers, family, and society, NICU nurses face many barriers in implementing IM for facilitation of the bonding process between mothers and infants. The current research study was designed to gain a better understanding of the attitudes held by NICU nurses regarding support for IM.

Chapter 3: Research Design and Methods

Chapter three identifies the research design, recruitment procedure, and settings sampling; the ethical considerations involved in this study; the development of a new instrument (AIMS); the process of data collection; and the procedure of data analyses.

STUDY DESIGN

This study was a pilot study employing an exploratory descriptive research design utilizing an online web-based survey as a means of exploring the attitudes of neonatal nurses regarding benefits of, concerns or issues with, and nurses' support for promoting IM in the NICU to facilitate maternal-infant attachment. Relationships between demographic variables (age, years in nursing practice, and years in NICU practice) and attitudes of NICU nurses regarding IM for preterm infants (benefits of, concerns with, and nurses' support for promoting IM in the NICU) as well as relationships among study variables were investigated. In addition, differences across demographic groups (ethnicity and education levels) regarding perceived benefits for infants and parents of, concerns with, and nurses' support for promoting IM in the NICU while controlling for age were explored.

RECRUITMENT

Institutional Review Board (IRB) approval was obtained from the University of Texas Medical Branch (UTMB) before study initiation. The principal investigator (PI) submitted a research proposal and IRB approval to the research committee of the National Association of Neonatal Nurses (NANN) organization and the Academy of Neonatal Nursing (ANN) organizations to secure access to membership contact information. After receiving acceptance from these organizations, the PI sent the IRB approved invitation script with a survey link

(generated with SurveyMonkey.com) to the NANN and ANN (Appendix A). Both organizations shortened the invitation script as per their policy; NANN posted the survey link with a shortened version of the invitation in the MYNANN page in their official website on December 6, 2013 and ANN posted the link with a shortened version of the invitation in an online newsletter on December 20, 2013. After 6 weeks, given a low response rate, the PI purchased 5,000 NICU nurses' e-mails from a commercial database company and delivered a detailed invitation script with a survey link on January 17, 2014.

INCLUSION/EXCLUSION CRITERIA

English speaking/reading/writing registered nurses practicing in the NICU within the U.S. regardless of age, gender, education, ethnicity, and years of experience in the NICU were recruited as study participants. Exclusion criteria included non-English speaking/reading/writing nurses, and nurses not practicing in the NICU within the U.S. as the invitation, study description, and online survey were in English only. Because this was an anonymous survey, participation constituted consent.

INSTRUMENT

Reliability

A literature review revealed no instrument specifically designed to address NICU nurses' attitudes regarding preterm IM to facilitate maternal-infant attachment in the NICU. Therefore, a self-report survey questionnaire was developed by utilizing sections from two instruments that had relevant questions on similar interventions for preterm infants: 1) opinions on the benefits of kangaroo care (Chia et al., 2005); and 2) the Infant Massage Assessment Tool (Hanson, 2013). Permissions were obtained from the authors to use subsets of items from their questionnaires and

to modify them appropriately for preterm IM. Most of the modifications addressed changes in wording identifying the targeted intervention (e.g., “infant massage” instead of “kangaroo care”). Each item from the benefits and concerns section of the questionnaire was verified with International Association of Infant Massage (IAIM) training manual (McClure, 2005). The instrument contains three heterogeneous sections: 1) benefits for preterm infants (15 items), and benefits for parents (nine items) together compiled the 24 items of the benefits section; 2) concerns (11 items); and 3) nurses’ support (4 items). The intent was to treat each subsection as its own subscale pending validation by psychometric analyses.

The resulting questionnaire, “The Attitudes of Infant Massage Scale” (AIMS), contained questions pertaining to: (I) demographics of the neonatal nurses on gender, age, and ethnicity; nursing educational qualifications; and years of experience as a nurse and a neonatal nurse; (II) a total of 39 items assessing three subscales: (i) perceived benefits for infants in favor of promoting IM for preterm infants (15 items), and benefits for parents (nine items); (ii) concerns and issues with promoting IM in the NICU (11 items); and (iii) nurses’ support for IM (four items) (see Appendix B). Participants were asked to reflect on how they felt regarding each statement by choosing from a 5-point Likert scale: “Strongly Disagree-1”, “Disagree-2”, “Uncertain-3”, “Agree-4”, and “Strongly Agree-5.”

The benefits subscale focused on how NICU nurses perceived benefits of IM for infants and parents and was designed on four categories for infants: *interaction, stimulation, relief, and relaxation*; and five main categories for parents: *decreasing stress, anxiety, and depression; stimulating lactation; improving their self-esteem; confidence in infant’s care; and involving fathers in infant’s care* (McClure, 2005). The concerns subscale focused on what concerns NICU nurses held surrounding reasons for not performing IM in the NICU and was aimed at issues in

four categories: *hospital policy, NICU environment, mothers, and nurses*. Sample questions for the concerns subscale were: “*Minimal hospital policy,*” “*Lack of spacing in the NICU,*” “*Maternal fear in massaging their infants,*” “*Nurses’ busy schedules,*” and “*Lack of confidence in teaching infant massage.*” Nurses’ support subscale focused on the extent to which NICU nurses were willing to support IM in the NICU. The questions in this subscale were: “*Encouraging parents to touch and massage their infants,*” “*Providing relevant information,*” “*Staying with the parents while massaging their infants,*” and whether they found IM “*Professionally satisfying.*” During questionnaire development, to ensure content/construct validity and face validity the survey questionnaire was appraised by a research committee consisting of four nurse scientists and a practicing neonatologist.

The AIMS questionnaire was composed of three subscales drawn from two instruments used in other studies, and there was no psychometric information available for these subscales and total scales (Chia et al., 2005; Hanson, 2013). Therefore, psychometric analyses were conducted in the current study to ensure that the subscales as conceived were reliable and valid for the current study and to provide comparable information for future uses.

SETTING

The AIMS questionnaire was published and administered through SurveyMonkey© and disseminated via an embedded link in the MYNANN page of the NANN’s official website and the electronic bi-monthly newsletter of the ANN to registered nurses working in the NICU in the U.S. who are members in their own respective organizations. A separate SurveyMonkey link was created for the 5,000 e-mail invitations to NICU nurses that had been purchased from the database company.

SAMPLING

There were 109 participants who completed the survey from the website posting in the NANN and the newsletter in the ANN as of January 6, 2014. There was no reminder posting by NANN as per their policy. However, the survey remained open on their website until February 6, 2014. Total respondents from both the organizations were 125 as of February 6, 2014. Out of 5,000 e-mails delivered, 606 e-mails had been opened. There were 90 activations of the link but only three respondents who completed the survey from the 5,000 e-mails sent from the database company from January 17, 2014 to February 6, 2014. In total, 128 participants completed the survey as of February 6, 2014, when enrollment was closed. Missing values were filled in where possible. Four respondents had insufficient data and were dropped, leaving 124 participants remaining for analysis.

ETHICAL CONSIDERATIONS

Institutional Review Board (IRB) approval was obtained from the University of Texas Medical Branch (UTMB) prior to the initiation of the research study. Documentation of IRB approval and a research application was submitted to NANN and ANN for review as part of their process to secure access to membership. Confidentiality and anonymity of the study participants were maintained throughout the study using anonymous survey methodology. Data were securely stored on a computer that had a password known only to the PI. The PI assured that information was collected for the specific research purpose only. No participants were identified by e-mail address or any other direct personal identifier in study records. The PI was mindful of concerns about privacy and intrusion and did not make additional e-mail approaches to potential respondents. The PI's e-mail contact information was included in the description of the study in

case any participant wished for clarification of any questions. There was no direct benefit to participants.

There are no risks associated with participation in this research study. Questions concerned nursing opinions about a noninvasive mode of supportive care (IM) with an at-risk population (preterm infants). There was no distress related to answering survey questions. However, participants might have experienced some gain in awareness of the benefits of IM during their completion of the survey.

DATA COLLECTION

The number of responses from the NANN and ANN were tracked in the SurveyMonkey Website. Total responses from the neonatal organizations were 125 for approximately two months. The PI obtained tracking reports in weeks one, two, three, and four from the database company that indicated a total of 606 individuals of the 5000 opened the e-mail, with 90 respondents activating the link producing a click-to-open ratio of 14.85%. Only three out of the 90 participants who accessed the survey (3%) completed the survey. The data were downloaded into an Excel file, and then imported into SPSS for cleaning and analysis.

DATA ANALYSIS

Data were analyzed using Statistical Package for Social Sciences (SPSS, version 22.0). Significance for all statistical analyses was set at $p < 0.05$.

Preliminary Analyses

Descriptive statistics (frequencies, percentages, ranges, medians, means, standard deviations) were conducted to characterize the demographic variables (age, ethnicity, education, years of experience as a nurse and as a neonatal nurse) and for each subscale to verify

distribution, sample sizes of subcategories, identify outliers and other potential problems. Relationships between interval level demographic variables (age, years of nursing experience, and years of NICU experience) were analyzed using Pearson's correlations to establish minimal relationships for study analyses and compliance with statistical assumptions. Associations between nominal variables were analyzed using Chi Square and identified two instances where it was necessary to collapse across insufficiently populated levels (level of education and ethnicity) to construct variables for subsequent analyses that met sample size requirements.

STUDY ANALYSES

The statistical analyses for each research question are described below.

Specific Aim 1

Explore neonatal nurses' attitudes regarding the benefits of, concerns with, and nurses' support for promoting IM in the NICU.

RESEARCH QUESTION 1.1

What do neonatal nurses perceive regarding the benefits of promoting IM for preterm infants and parents in the NICU? Analyses included descriptive statistics (mean, median, percentages, and range) calculated for each item in benefits for infants and parents as well as Total Mean Score (TMS) of benefits for parents and infants.

RESEARCH QUESTION 1.2

What are the neonatal nurses' concerns and issues with promoting IM for preterm infants in the NICU? Analyses included descriptive statistics (mean, median, percentages and range) calculated for each item in concerns as well as the TMS of concerns.

RESEARCH QUESTION 1.3

To what extent do NICU nurses indicate support for promoting IM for preterm infants in the NICU? To examine this question, descriptive statistics (mean, median, percentages, and range) were calculated for each nurses' support item as well as for the TMS of nurses' support.

Specific Aim 2

Identify relationships between demographic variables (age, years in nursing practice, years in NICU practice) and benefits for infants and parents, concerns, and nurses' support regarding IM for preterm infants.

RESEARCH QUESTION 2.1

What are the relationships between age, years in nursing practice, years in NICU practice and benefits for infants and parents, concerns, and nurses' support? Pearson's correlations were computed to examine the relationship between age, years in nursing practice, years in NICU practice and TMS for benefits for infants and parents, concerns, and nurses' support.

RESEARCH QUESTION 2.2

What are the relationships between TMS benefit for infants and parents, concerns with, and nurses' support in promotion of IM with and without controlling for age? Pearson's partial correlations were conducted between the TMS of benefits for infants and parents and TMS of concerns and the TMS of nurses' support with and without controlling for age.

Specific Aim 3

Identify the differences across demographic groups (ethnicity and education) on the attitudes of NICU nurses regarding IM for preterm infants.

RESEARCH QUESTION 3.1

What are the differences across demographic groups (ethnicity and education) regarding perceived benefits for infants and parents for promoting IM for preterm infants in the NICU, with and without controlling for age?

RESEARCH QUESTION 3.2

What are the differences across demographic groups (ethnicity and education) regarding concerns and issues with promoting IM for preterm infants in the NICU with and without controlling for age?

RESEARCH QUESTION 3.3

What are the differences across demographic groups (ethnicity and education) regarding nurses' IM support for preterm infants in the NICU with and without controlling for age?

Analyses were conducted for research questions 3.1, 3.2, and 3.3, test of differences for demographic groups (ethnicity and education) regarding perceived benefits for infants and parents, concerns and issues with, and nurses' support for promoting IM for preterm infants in the NICU. Without controlling for age, an independent t-test was computed to examine the differences across ethnicity on TMS of benefits for infants and parents, concerns, and nurses' support. One-way ANOVA was calculated to examine the differences across education level of the NICU nurses on TMS of benefits for infants and parents, concerns, and nurses' support. When controlling for age, one-way ANCOVA was utilized to examine the difference across ethnicity and education level of the NICU nurses on TMS of benefits for infants and parents, concerns, and nurses' support.

Chapter 4: Results

This chapter presents the results of the study. The analyses examined NICU nurses' attitudes regarding the benefits of, concerns with, and their support for promoting IM in the NICU to facilitate mother-infant attachment. This chapter presents foundational preliminary analyses (descriptive analyses of the sample, critical associations, relationships, and differences, and psychometric characteristics of the instruments) that could impact study analyses. Each specific aim and associated research questions is presented separately.

PRELIMINARY ANALYSES

Descriptive Statistics: Demographic Characteristics of Nursing Sample

Table 4.1 displays the demographic characteristics of the sample. The sample was largely female and Caucasian. Participant ages ranged from 24 years to 70 years with an average age of 48.85 years, which was very comparable to the national average age of registered nurse in the United States of 47 years (ANA, 2011). The median age of registered nurses in this study was 51 years, compared to the 2008 National Sample Survey of Registered Nurses reported median age of 55 (U.S. Department of Health and Human Services [HHS], 2010). Among the 124 NICU nurses who participated in this study, the average number of years of experience in nursing was about 24 years, ranging from a minimum of one year to a maximum 50 years. According to the HHS (2010), over 50% of working registered nurses had more than 40 years of nursing experience. The current study only reported 4% of participants as having 40 years or more of nursing experience. The average number of years of experience in the NICU was 19.65 with a range from 1 to 42 years. Among the study participants, over 50% had bachelor's degrees and more than one-third held graduate degrees.

Table 4.1: Descriptive Statistics: NICU Nurse Sample Characteristics

Characteristics	N	Mean (SD or %)	Median	Min-Max
Age	124	48.85 (10.00)	51	24-70
Years of experience in nursing	124	23.95 (11.13)	25	Jan-50
Years of experience in NICU nursing	124	19.65 (12.00)	23	Jan-42
Gender	124			
Male	3	2.40%		
Female	121	97.60%		
Ethnicity	124			
Caucasian	102	82.30%		
All Others	22	17.70%		
Level of Education	124			
Less than 4 year degrees	12	9.70%		
BSN	64	51.60%		
Graduate degrees	48	38.70%		
Heard of using IM	124			
Yes	117	94.40%		
No	7	5.60%		
Had training on IM	124			
Yes	33	26.60%		
No	91	73.40%		
Form of IM training received	33	26.60%		
Infant massage training	20	60.60%		
In-service presentation at work	7	21.20%		
Website	1	3.00%		
Journal Article	1	3.00%		
Health-care provider	2	6.10%		
Physical Therapist	2	6.10%		
Seen using IM in the NICU	124			
Yes	72	58.10%		
No	52	41.90%		
Ever Used IM for preterm infants	124			
Yes	42	33.90%		
No	82	66.10%		
Years of experience in using IM	42			
0-5 years	23	57.10%		
6-10 years	11	26.20%		
11-15 years	1	2.40%		
16-20 years	4	9.50%		
21-25 years	2	4.80%		
Frequency of IM for preterm infant	42			
Rarely	9	21.40%		
Sometimes	26	61.90%		
Often	7	16.70%		

Descriptive Statistics: Familiarity/Experience with IM (Table 4. 1)

The overwhelming majority of participants had heard of using IM in the NICU with 33 participants (26.6%) having received training on IM. Of those who had training, the majority (60.6%) had received formal IM training followed by brief training experiences through in-service presentations at work. Of the 58% of nurses who reported seeing IM in use in the NICU, 34% (n=42) reported having used IM in the NICU themselves. Among the 42 nurses who had used IM, most reported using it only “sometimes” and most had used IM only in the last five years. Only two respondents (4.8%) reported using IM for more than 20 years.

Descriptive Statistics: Instrument Subscales

Descriptive analyses were conducted for each subscale’s TMS and are shown in Table 4.2. Scores ranged from 1-5. High scores for Benefits and Nursing Support indicated favorable endorsement, while high scores for Concerns indicated high levels of negative attitudes. Results illustrated that the means, medians, and modes were high for Benefits and Nurses’ Support and low for Concerns, reflecting high positive attitudes regarding benefits of IM and nurses’ support and low concerns with IM. This pattern was consistent with a general endorsement for this intervention.

Table 4.2: Descriptive Statistics: Instrument Subscales

Statistics	Benefits TMS N=124	Concerns TMS N=122	Nurses’ Support TMS N=124
Mean	4.13	2.71	4.12
Median	4.17	2.73	4.00
Mode	5.00	2.00	4.00
Standard Deviation	.69	.73	.61
Range	4.00	3.64	3.00
Minimum	1.00	1.00	2.00
Maximum	5.00	4.64	5.00

PSYCHOMETRIC ANALYSES

Reliability

Cronbach's alphas have been displayed in Table 4.3. All item level statistics have been presented in Appendix B. The Benefits subscale (15 items for infants and nine items for parents) demonstrated an extremely high level of reliability, indicating the probability of some redundancy in the items. The second subscale, Concerns with promoting IM in the NICU, consisted of 11 items that measured NICU nurses' concerns about performing IM in the NICU and displayed a very satisfactory reliability meeting the criteria for even established instruments, i.e., $\alpha=.80$. The third subscale, Nurses' Support in the NICU, displayed an adequate Cronbach's alpha for a new instrument, satisfying the minimum criteria of .70. For the Benefits and Concerns subscales, there were no items that, if removed, would have improved the alphas. However, on Nurses' Support, the removal of item 3, "Nurses should remain with parents" would have improved the Cronbach's for that subscale to .82 and total instrument to .94, indicating the different content nature of that item and its poor fit with the other three items on the subscale. However, all reliabilities were sufficient for the use of the subscales as configured for study analyses.

Table 4.3: Instrument's Reliability

Scales	No. of Items	Mean	Cronbach's Alpha
Benefits	24	99.29	.97
Concerns	11	29.94	.87
Nurses' Support	4	16.46	.71
All Scales	39	145.38	.93

Factor Analysis

Out of 124 participants, complete data from 110 participants were available for the factor analysis. Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .882 (greater than 0.5), and

Bartlett's Test of Sphericity was significant ($p < .000$); both results indicated that factor analysis was appropriate for this dataset. Employing principal components analysis, both orthogonal (varimax) and oblique (oblim) rotations were explored using three rules for factor extraction: 1) the eigenvalue ≥ 1 ; 2) a forced factor solution based on the scree plot; and 3) a forced factor solution based on proposed subscales. All three approaches were tested with varimax and oblim rotations. Results for each have been presented below.

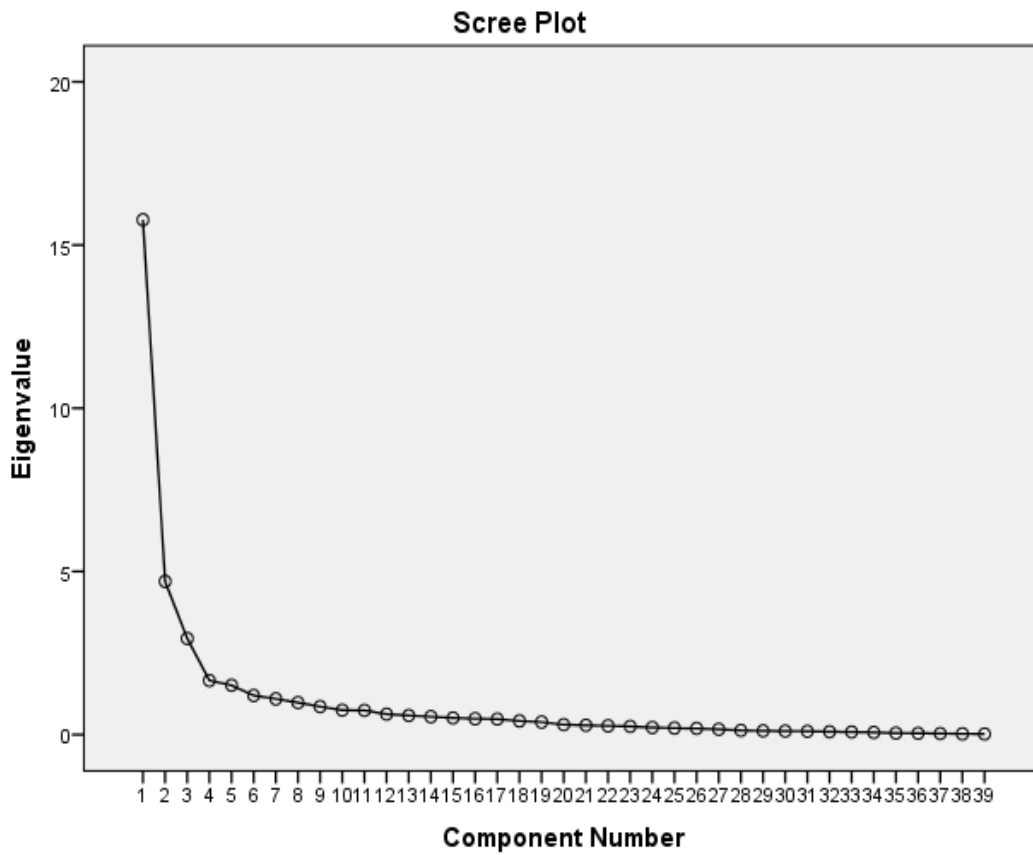
Using the criteria of eigenvalues ≥ 1 , seven factors were identified accounting for a cumulative total of 74.05% of the variance (see Table 4.4). While the seven factor solution extracted the four separate subscale dimensions of benefits for infants, benefits for parents (subcomponents of the overall Benefits subscale), concerns, and nursing support, it also generated three fractured factors composed of a combination of items from different scales. There were several items from the benefits for infants that formed a small two-item factor; two concern items and a single nursing support item that formed a separate factor; and a single concern item that formed a separate factor. Factor solutions with less than three items were considered insufficient. In addition to these problematic small extraneous factors, there were numerous secondary loadings (i.e., second loadings of .40 or greater on other factors) largely between the two Benefits subscales, which suggested that these two subcomponents could be combined into the larger proposed Benefits subscale. The oblim solution was even less satisfactory with an increase in secondary loadings and more fragmented factor structure.

The scree plot (see Figure 4.1) suggested a possible four-factor solution, which would be congruent with two Benefits subscales, a Concern subscale, and a Nursing Support subscale. Thus a four-factor solution was tested. In the four-factor forced solution with a varimax rotation, the four factors accounted for a cumulative total of 70.74% of variance. The 16 items on factor 1

Table 4.4: Principal components factor analyses with eigenvalues ≥ 1

Items	Eigenvalues			Rotated Sum of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.775	40.448	40.448	8.945	22.935	22.935
2	4.695	12.039	52.487	7.803	20.007	42.942
3	2.944	7.549	60.037	4.313	11.059	54.000
4	1.659	4.255	64.291	2.613	6.700	60.700
5	1.513	3.878	68.170	1.873	4.802	65.501
6	1.199	3.075	71.245	1.794	4.601	70.103
7	1.095	2.808	74.053	1.541	3.950	74.053

Figure 4.1: Scree plot showing potential factors



and nine items on factor 2 appeared to measure benefits of IM for mothers and infants (see Table 4.5). However, eight of the 10 items loading primarily on factor 2 had very high secondary loadings on factor 1, indicating a large degree of overlap. Nine of the 11 items loading primarily on factor 3 and two items on factor 2 all corresponded to Concerns and three items from the Nurses' Support were loaded on factor 4. The fourth Nurses' Support item, "*Nurses should remain with parents*" was loaded primarily on factor 3 along with the Concern items. Although most of the items loaded on their own factor, there were huge overlaps in Concerns dimension and the benefits items between factor 1 and 2 and at least one nurses' support items grouped with the Concerns dimension.

Given the poor results with the larger factor solutions suggested by eigenvalues or scree plots, the next approach was to investigate whether the factor structure would replicate the proposed subscale dimensions if a three-factor solution (i.e., based on the proposed three subscales) was forced. If the items composing each subscale grouped together when the structure was held to three dimensions, it would provide support for the validity of item membership for each sub-dimension.

As seen in Table 4.6, the first factor had most of the benefits items (21), the second factor had all four nursing support items plus three of the benefits items, and the third factor had all the concern items (11). However, the first and second factors shared 15 secondary loadings across the two factors, representing a significant problematic overlap between the two factors. This supported an exploration of the factor structure using the oblique approach (oblim), which would allow for correlated factor loadings.

Table 4.5: Varimax Factor Rotation with Four Forced Factors

Items	Factors			
	1	2	3	4
B-Decreased anxiety of the mother	.865	.090	.012	.103
B-Decreased stress of the mother	.861	.091	.032	.132
B-Improving self-esteem	.860	.149	.030	.107
B-Decreased PN depression	.852	.013	.046	.091
B-Improved sleep pattern	.847	.058	.022	.086
B-Improving parenting skills	.843	.128	.083	.164
B-Improving confidence in infant's care	.823	.238	.087	.097
B-Improving bonding with her infant	.822	.261	.075	.119
B-Reduced stress	.817	.185	.039	.089
B-Being calm	.809	.157	.125	.082
B-Stimulating lactation	.770	.209	.015	.135
B-Stimulates growth and development	.730	.183	.041	.231
B-Relief of gas and colic	.709	.134	.007	.145
B-Relief of constipation	.700	.120	.051	.104
B-Involving fathers in infant care	.673	.225	.085	.126
B-Stimulates language development	.546	.266	-.094	.094
B-Providing one-one quality time	<u>.584</u>	.757	.066	-.027
B-Promoting Love & Respect	<u>.528</u>	.755	.064	-.017
B-Providing nurturing touch	<u>.554</u>	.752	-.021	.042
Bonding between parents and infants	<u>.597</u>	.733	-.025	-.008
B-Providing undivided attention	<u>.601</u>	.679	.037	-.030
B-Providing early contact	<u>.596</u>	.660	.025	-.032
B-Promoting secure attachment	<u>.625</u>	.647	-.016	-.049
B-Promoting verb/nonverbal comm.	<u>.571</u>	.587	-.033	-.125
C-Lack of confidence in teaching IM	.042	-.461	.417	-.211
C-Lack of know/skills on method of IM	.108	-.363	.341	-.233
C-Added burden to NICU nurses	-.074	-.034	.724	.013
C-Nurses' busy schedules	.002	.133	.719	-.200
C-Risk of interfering with equipment	.012	-.028	.713	.096
C-Inadequate spacing in the NICU	-.085	.051	.712	-.052
C-Lack of time due to staff shortages	.095	.209	.685	.136
C-Negative attitude on FCC	.058	-.134	.683	-.190
C-Mat fear in massaging their infants	.042	.021	.654	.132
C-Minimal stimulation policy	.190	-.072	.641	.262
C-Nurses' fear of over-stimulation	.223	-.189	.609	-.028
NS-Nurses should remain with parents	.190	-.282	-.295	.088
NS-Encouraging parents to massage	.229	.047	.048	.821
NS-Professionally satisfying	.332	-.066	.011	.784
NS-Relevant information on massage	.313	-.008	-.024	.744

Bolded numbers = Primary loadings; Underlined numbers = Secondary loadings; B=Benefits, C= Concerns: NS=Nursing Support

Table 4.6: Varimax Rotation with Three Forced Factors

Items	Factors		
	1	2	3
B-Providing one-one quality time	.949	.030	.017
Bonding between parents and infants	.932	.067	-.070
B-Providing nurturing touch	.910	.059	-.073
B-Promoting Love & Respect	.909	-.001	.012
B-Providing undivided attention	.900	.077	-.001
B-Promoting secure attachment	.893	.100	-.048
B-Providing early contact	.883	.082	-.011
B-Promoting verbal/nonverbal communication	.826	<u>.047</u>	-.057
B-Improving bonding with her infant	.709	<u>.499</u>	.091
B-Improving confidence in infant's care	.696	<u>.495</u>	.106
B-Reduced stress	.652	<u>.514</u>	.064
B-Improving self-esteem	.650	<u>.570</u>	.062
B-Stimulating lactation	.632	<u>.500</u>	.033
B-Being calm	.630	<u>.511</u>	.153
B-Improving parenting skills	.617	<u>.598</u>	.113
B-Decreased anxiety of the mother	.609	<u>.599</u>	.051
B-Involving fathers in infant care	.585	<u>.417</u>	.094
B-Stimulates growth and development	.572	<u>.539</u>	.055
B-Relief of gas and colic	.534	<u>.500</u>	.030
B-Stimulates language development	.532	.307	-.094
B-Relief of constipation	.526	<u>.473</u>	.076
NS-Professionally satisfying	.039	.711	.003
NS-Relevant information on massage	.075	.651	-.038
B-Decreased PN depression	<u>.546</u>	.616	.093
B-Decreased stress of the mother	<u>.603</u>	.612	.069
NS-Encouraging parents to massage	.052	.611	.019
B-Improved sleep pattern	<u>.576</u>	.591	.064
NS-Nurses should remain with parents	-.113	.326	-.253
C-Added burden to NICU nurses	-.048	-.075	.716
C-Nurses' busy schedules	.159	-.223	.707
C-Risk of interfering with equipment	-.002	.030	.706
C-Negative attitude on FCC	-.007	-.058	.704
C-Inadequate spacing in the NICU	.018	-.158	.697
C-Lack of time due to staff shortages	.221	.004	.655
C-Minimal stimulation policy	.051	.270	.643
C-Mat fear in massaging their infants	.046	.053	.642
C-Nurses' fear of over-stimulation	.030	.178	.640
C-Lack of confidence in teaching IM	-.267	.085	.478
C-Lack of know and skills on method of IM	-.150	.077	.397

Bolded numbers = Primary loadings; Underlined numbers = Secondary loadings; B=Benefits, C= Concerns; NS=Nursing Support

In the three forced factor solution with a varimax rotation, the three factors accounted for a cumulative value of 60.0% (see Table 4.7). There were five benefit items (four dealing with benefits to parents and one benefit to infant improved sleep pattern) that showed significant but small secondary loadings on the Nursing Support factor, indicating some remaining overlap between those two dimensions for those items.

Table 4.7: Principal Components Factor Analysis with Three Forced Factors

Item	Eigenvalues			Rotated Sum of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.775	40.448	40.448	12.585	32.270	32.270
2	4.695	12.039	52.487	6.093	15.623	47.893
3	2.944	7.549	60.037	4.736	12.144	60.037

The resulting oblim rotation with three factors produced the best solution (see Table 4.8). Factor 1 was composed of all 24 benefit items, factor 2 included all 11 concern items, and factor 3 included all four nurses' support items. All but three item loadings on their respective factors were in the good to excellent range. All 24 benefits items had substantial loadings (.608 -.881) on Factor 1, all 11 concern items had moderate to strong loadings (.403 -.711) on Factor 2, and the four nurses' support items had small to moderate loadings (.349 -.680) on Factor 3. Due to the clear recovery of the three subscales as well as the strong factor loadings, the proposed factor structure was supported.

PRELIMINARY ANALYSES OF STUDY VARIABLES

Nominal Variables

A chi-square test was performed to investigate the association between NICU nurses' ethnicity and educational level. Because ethnicity had seven categories (Non-Hispanic White, Black or

Table 4.8: Oblim Rotation with Three Factors

Items	Factors		
	1	2	3
B-Providing one-one quality time	.881	.006	-.199
B-Bonding between parents and infants	.879	-.079	-.158
B-Promoting secure attachment	.857	-.055	-.117
B-Providing undivided attention	.855	-.009	-.143
B-Providing nurturing touch	.855	-.083	-.161
B-Improving bonding with her infant	.852	.110	.312
B-Providing early contact	.841	-.019	-.133
B-Improving confidence in infant's care	.839	.126	.311
B-Promoting Love & Respect	.832	-.001	-.220
B-Improving self-esteem	.825	.087	.395
B-Improving parenting skills	.808	.140	<u>.430</u>
B-Reduced stress	.805	.086	.340
B-Decreased anxiety of the mother	.800	.078	<u>.433</u>
B-Decreased stress of the mother	.800	.097	<u>.447</u>
B-Being calm	.786	.174	.341
B-Stimulating lactation	.780	.054	.333
B-Promoting verbal/nonverbal communication	.773	-.066	-.152
B-Improved sleep pattern	.767	.091	<u>.433</u>
B-Decreased PN depression	.750	.123	<u>.464</u>
B-Stimulates growth and development	.742	.079	.384
B-Involving fathers in infant care	.706	.111	.262
B-Relief of gas and colic	.690	.052	.356
B-Relief of constipation	.674	.097	.330
B-Stimulates language development	.608	-.083	.172
C-Added burden to NICU nurses	-.054	.711	-.075
C-Risk of interfering with equipment	.030	.706	.016
C-Negative attitude on FCC	-.010	.700	-.068
C-Nurses' busy schedules	.076	.690	-.268
C-Inadequate spacing in the NICU	-.027	.686	-.171
C-Minimal stimulation policy	.173	.657	.238
C-Lack of time due to staff shortages	.222	.651	-.062
C-Nurses' fear of over-stimulation	.117	.649	.153
C-Mat fear in massaging their infants	.081	.643	.028
C-Lack of confidence in teaching IM	-.197	.485	.137
C-Lack of know and skills on method of IM	-.096	.403	.103
NS-Professionally satisfying	.321	.045	.680
NS-Relevant information on massage	.329	.000	.615
NS-Encouraging parents to massage	.293	.055	.580
NS-Nurses should remain with parents	.021	-.231	.349

Bolded numbers = Primary loadings; Underlined numbers = Secondary loadings; B=Benefits, C= Concerns; NS=Nursing Support

African American, Hispanic or Latin, American Indian or Alaskan Native, Asian, Native Hawaiian or Other Pacific Islander, and Others) and education had seven categories (diploma, associate degree, BSN, MSN, DNP, PhD, and Others), insufficient membership across all cells was found and it was necessary to collapse categories on both variables into a smaller number for use in subsequent analyses.

Education was reclassified grouping diploma, associate degree, and other together as “less than 4 year degrees,” “BSN” alone, and MSN, DNP, and PhD together as “graduate degrees.” Ethnicity was regrouped into categories of “Caucasian” and “all others”. A chi-square analysis was then conducted using the collapsed categories of education and ethnicity. There was no statistically significant association identified between education and ethnicity, indicating that the distribution of ethnicity across education groups was not different than that expected by chance.

Interval Variables

Relationships between age, experience in nursing, and experience in NICU nursing were examined using Pearson’s correlation (Table 4.9). There were high positive significant relationships between age, experience in nursing, and experience in NICU nursing, indicating a logical and expected association between age and more years of experience in nursing and in NICU nursing. However, the implication for study analyses was that these three variables were so highly correlated that they could not be included as covariates together.

Table 4.9: Pearson’s Correlations between age, experience in nursing, and NICU nursing

Variables (n=124)	Age in years	Exp. in nursing
Exp. in nursing	$r = .814$ $p < .001$	
Exp. in NICU nursing	$r = .750$ $p < .001$	$r = .847$ $p < .001$

STUDY ANALYSES

Specific Aim 1

Explore neonatal nurses' attitudes regarding the benefits of, concerns with, and nurses' support for promoting IM in the NICU.

Research Question 1.1

What do neonatal nurses perceive regarding the benefits of promoting IM for preterm infants and parents in the NICU?

Research Question 1.2

What are the neonatal nurses' concerns and issues with promoting IM for preterm infants in the NICU?

Research Question 1.3

To what extent do NICU nurses indicate support for promoting IM for preterm infants in the NICU?

Research questions 1.1, 1.2, and 1.3 queried NICU nurses' perceptions regarding benefits of, concerns and issues with, and nurses' support in promoting IM for preterm infants in the NICU. Descriptive statistics (means, median, standard deviations, percentages, and range) were calculated for each item in the subscale of benefits for infants and parents, concerns, and nurses' support as well as TMS for each of these three subscales individually. Each item had five response options from 1-strongly disagree to 5-strongly agree. All 124 participants had complete data for the Benefits scale and Nurses' Support scale. There were two participants with missing data on the Concerns scale, resulting in a sample size of 122 for this scale. TMS were calculated by summing all response items in each subscale and dividing by the number of items, with

possible score ranging from 1.00 to 5.00. In the Benefits and Support subscales, high scores could be interpreted as reflecting favorable attitudes (positive attitude) whereas low scores were non-favorable attitudes (negative attitude) regarding IM.

As shown in Table 4.10, for each item in the Benefits subscale, the mean values ranged from 3.33 to 4.48 with a TMS of 4.31 reflecting a strong bias towards positive attitudes. The items in the Nurses' Support subscale's mean values similarly ranged from 3.92 to 4.40 with a TMS of 4.11 again reflecting positive attitudes. Since the Concerns subscale involved endorsement of items reflecting concerns and issues with IM, high scores represented negative attitudes whereas low scores reflective positive attitudes. As shown in the Table 4.10, the mean values for the items in the Concerns subscale ranged from 2.05 to 3.39 with a TMS of 2.72 indicating low concerns with IM and overall positive attitudes.

SPECIFIC AIM 2

Identify relationships across demographic variables (age, years in nursing practice, years in NICU practice) between benefits for infants and parents, concerns, and nurses' support regarding IM for preterm infants.

Research Question 2.1

The first research question in Specific Aim 2 queried whether there were relationships between NICU nurses' age in years, years in nursing practice, years in NICU practice and their perceptions on Benefits TMS of IM for infants and parents, Concerns TMS, and Nurses' Support in promoting IM in the NICU. Pearson's correlation coefficients were computed and the results

Table 4.10: Descriptive Statistics for Instrument Subscales

Items	Mean	Std. Deviation	Range	Min.-Max
Benefits of IM (N = 124)	4.13	.69	4.00	1.00-5.00
Providing early contact	4.31	.90	4.00	1.00-5.00
Providing one-one quality time	4.36	.89	4.00	1.00-5.00
Providing undivided attention	4.30	.89	4.00	1.00-5.00
Providing nurturing touch	4.48	.84	4.00	1.00-5.00
Bonding between parents and infants	4.44	.89	4.00	1.00-5.00
Promoting secure attachment	4.22	.88	4.00	1.00-5.00
Promoting verb/nonverb communication	4.23	.96	4.00	1.00-5.00
Promoting Love & Respect	4.31	.92	4.00	1.00-5.00
Stimulating language development	3.33	.91	4.00	1.00-5.00
Stimulating growth and development	4.15	.93	4.00	1.00-5.00
Relief of gas and colic	3.93	.95	4.00	1.00-5.00
Relief of constipation	3.90	.94	4.00	1.00-5.00
Reducing stress	4.13	.85	4.00	1.00-5.00
Improving sleep pattern	4.18	.83	4.00	1.00-5.00
Being calm	4.20	.81	4.00	1.00-5.00
Decreasing stress of the mother	4.11	.85	4.00	1.00-5.00
Decreasing anxiety of the mother	4.12	.85	4.00	1.00-5.00
Decreasing PN depression	3.82	.90	4.00	1.00-5.00
Stimulating lactation	3.91	.93	4.00	1.00-5.00
Improving self-esteem	4.04	.87	4.00	1.00-5.00
Improving confidence in infant's care	4.34	.82	4.00	1.00-5.00
Improving parenting skills	4.04	.86	4.00	1.00-5.00
Improving bonding with her infant	4.40	.75	4.00	1.00-5.00
Involving fathers in infant care	4.01	.86	4.00	1.00-5.00
Concerns in Promoting IM (N = 122)	2.72	.73	3.64	1.00-4.64
Minimal stimulation policy	2.99	1.36	4.00	1.00-5.00
Lack of knowledge and skills on method of IM	2.05	.93	4.00	1.00-5.00
Lack of time due to staff shortages	2.34	1.13	4.00	1.00-5.00
Negative attitude on FCC	3.15	1.20	4.00	1.00-5.00
Nurses' busy schedules	2.44	1.15	4.00	1.00-5.00
Inadequate spacing in the NICU	3.39	1.12	4.00	1.00-5.00
Nurses' fear of over-stimulation	2.52	1.10	4.00	1.00-5.00
Lack of confidence in teaching IM	2.27	.95	4.00	1.00-5.00
Maternal fear on massaging their infant	2.68	.99	4.00	1.00-5.00
Added burden to NICU nurses	3.11	1.20	4.00	1.00-5.00
Risk of interfering with equipment	2.72	.73	4.00	1.00-5.00
Concerns: Total Mean Score	2.72	.73	3.64	1.00-4.64
Nurses' Support in Promoting IM (N = 124)	4.11	.61	3.00	2.00-5.00
Encouraging parents to massage	4.08	.93	4.00	1.00-5.00
Relevant information on massage	4.40	.69	3.00	2.00-5.00
Nurses should remain with parents	3.92	.86	3.00	2.00-5.00
Professionally satisfying	4.06	.83	4.00	1.00-5.00

have been depicted in Table 4.11. The results showed a pattern of small significant positive correlations between age, experience in nursing, and experience in NICU nursing with concerns indicating that older NICU nurses and nurses with more years of experience in nursing and NICU nursing exhibited greater concerns with promoting IM in the NICU.

Table 4.11: Correlation between Age, Experience in Nursing, Experience in NICU nursing and Benefits TMS, Concerns TMS, and IM Support TMS

Variable (N)	Age	Experience in Nursing	Experience in NICU Nursing
Benefits TMS (124)	$r=.008$ $p=.932$	$r=.065$ $p=.474$	$r=.013$ $p=.888$
Concerns TMS (122)	$r = .365$ $p \leq .001$	$r = .399$ $p \leq .001$	$r = .388$ $p \leq .001$
Nurses' Support TMS (124)	$r=-.076$ $p=.403$	$r=.002$ $p=.986$	$r=-.088$ $p=.330$

However, there were no significant relationships between age, experience in nursing, and experience in NICU nursing with benefits for infants and parents or nurses' support, indicating that these demographic variables were not factors of influence on attitudes for these two dimensions.

Research Question 2.2

Research question 2.2 asked whether there were relationships between the benefits of, concerns with, and nurses' support for promotion of IM, with and without controlling for age. Pearson's correlational analyses were conducted to examine the relationship between Benefits TMS for infants and parents, Concerns TMS, and Nurses' Support TMS, both with and without controlling for age to evaluate the contribution of age to the pattern of relationships.

When not controlling for age, a small significant positive relationship between Benefits TMS and Nurses' Support TMS was found indicating that more positive attitudes toward the benefits of IM were related to more positive attitudes in nursing support (see Table 4.12). No significant relationship between benefits and concerns or nurses' support and concerns was observed, indicating independence between concerns and issues with IM and their attitudes of the benefits and support. This would suggest that there was no systematic association between endorsements of IM and simultaneous expressions of concerns, which supported the Dual Attitude Model.

Table 4.12: Pearson's correlations between benefits, concerns, and nurses' support

Variables	Benefits TMS	Concerns TMS
Concerns TMS	$r = .110$ $p = .227$	
Nurses' Support TMS	$r = .352$ $p \leq .001$	$r = -.023$ $p = .799$

When controlling for age, the results changed very little, still reflecting a small significant positive correlation between Benefits TMS and Nurses' Support TMS even after controlling for age (see Table 4.13). Thus, age had very little influence on attitudes of NICU nurses. Although not significant, it was interesting to note that the impact of age could primarily be seen on the relationship between support for IM and Concerns, shifting a small negative relationship to a small positive relationship. This is similarly reflected by the small significant relationship found between age and concerns during the preliminary analyses.

Table 4.13: Partial Correlational Analysis of TMS of benefits for infants and parents, concerns with, and IM support in promotion of IM controlling for age.

Control Variable	Variables	Benefits TMS	Concerns TMS
Age in Years	Concerns TMS	$r=.114$ $p=.213$	
	Nurses' Support TMS	$r=.354$ $p=\leq .001$	$r=.008$ $p=.935$

SPECIFIC AIM 3

Identify the differences across demographic groups (ethnicity and education) in the attitudes of NICU nurses regarding IM for preterm infants. Research questions 3.1, 3.2, and 3.3 asked about differences across demographic groups, i.e., ethnic groups (Caucasian and other groups) and education levels (less than four years degrees, BSN, graduate degrees), regarding perceived benefits of IM for infants and parents, concerns with, and nurses' support for promoting IM for preterm infants in the NICU with or without controlling for age.

An independent t-test was computed to evaluate the difference across ethnicity on TMS of Benefits, Concerns, and Nurses' Support. The results (Table 4.14) showed that there was a significant difference (but of small magnitude) across ethnic groups with Caucasian nurses, demonstrating slightly higher concerns in promoting IM in the NICU. However, no differences were found across ethnicity on Benefits or Nurses' Support. Notably, scores for Concerns were low for both groups (a mean of 3.0 would be neutral), while scores for Benefits and Nurses' Support were high (a mean of 5.0 would be perfect endorsement). These results indicated that ethnicity does not play a substantial role in attitudes towards IM in the NICU.

Table 4.14: T-test: Differences across ethnicity on TMS of Benefits, Concerns, or Nurses' Support

DV	IV	M	SD	t-test	<i>p</i>
Benefits TMS	White (102)	4.13	.71	-.17	.865
	Others (22)	4.16	.64		
Concerns TMS	White (100)	2.83	.66	3.69	.001
	Others (22)	2.23	.83		
Nurses' Support TMS	White (102)	4.11	.61	-.11	.912
	Others (22)	4.12	.62		

A one-way analysis of variance (ANOVA) was calculated to evaluate the differences across the levels of education of NICU nurses on their perceptions of Benefits, Concerns, and Nurses' Support. The results (Table 4.15) indicated that no significant differences across level of education of NICU nurse on their perceptions of Benefits, Concerns, and Nurses' Support. The same pattern of low scores for Concerns and high scores for Benefits and Nurses' Support as those seen with ethnic comparisons were in evidence for education.

Table 4.15: One-way ANOVA (Education-less than 4 year degree, BSN, and graduate degree and TMS of benefits, concerns, and nurses' support)

IV Education	DV Subscales	Mean	SD	F	<i>p</i>
Less than 4 year degrees (N=12)	Benefits TMS	4.236	.497	.304	.738
BSN (N=64)		4.155	.738		
Graduate degrees (N=48)		4.079	.682		
Less than 4 year degrees (N=11)	Concerns TMS	2.695	.733	.034	.967
BSN (N=63)		2.740	.769		
Graduate degrees (N=48)		2.709	.680		
Less than 4 year degrees (N=12)	Nurses' Support TMS	4.083	.536	.191	.826
BSN (N=64)		4.148	.576		
Graduate degrees (N=48)		4.079	.671		

p ≤ .05

The need to control for age was examined using one-way analyses of covariance (ANCOVA) to assess differences across ethnic groups and educational levels on Benefits TMS, Concerns TMS, and Nurses' Support TMS controlling for age. Results (Table 4.16) indicated that no significant differences across levels of ethnicity or education on Benefits, Concerns, or Nurses' Support in promoting IM in the NICU after controlling for age. The small significant effect for ethnicity was accounted for by controlling for age. These results confirmed that neither ethnicity nor education was a contributing factor to attitudes of NICU nurses regarding preterm IM.

Table 4.16: One-way ANCOVA: Differences across Ethnic groups, Education groups on TMS of Benefits, Concerns, and Nurses' Support after controlling age

CV	DV (TMS)	IV-Groups (n)	M	SD	<i>F</i>	<i>p</i>
		Ethnicity				
Age	Benefits	White (102)	4.13	.71	.076	.783
		Other (22)	4.16	.64		
	Concerns	White (102)	2.83	.66	.400	.530
		Other (22)	2.23	.83		
	Nurses' Support	White (102)	4.11	.61	.009	.925
		Other (22)	4.12	.62		
		Education				
Age	Benefits	≤ 4 year degree (12)	4.24	.50	.368	.693
		BSN (64)	4.16	.74		
		Grad. Degree (48)	4.08	.68		
	Concerns	≤ 4 year degree (12)	2.70	.73	.087	.916
		BSN (64)	2.74	.77		
		Grad. Degree (48)	2.71	.68		
	Nurses' Support	≤ 4 year degree (12)	4.08	.54	.594	.554
		BSN (64)	4.15	.58		
		Grad. Degree (48)	4.08	.67		

SUMMARY OF RESULTS

The study sample consisted of 124 participants—three males and 121 females. These were NICU nurses who spoke/read/wrote English and practiced in the NICU in the U.S., with an average age of 48.85 years, a median age of 51 years, an average of 24 years of experience in

nursing, and an average number of years of experience in the NICU of 19.65 years. The majority of participants was Caucasian (102) and educated (BSN degrees=64, graduate degrees=48). Most participants had heard of using IM and a substantial number had training, used IM themselves, or had witnessed IM in use. High scores for subscales of Benefits and Nurses' Support and low scores for the Concerns subscale indicated positive attitudes toward IM.

Although the instrument was new, reliability for all three subscales was high. Factor analyses indicated an oblim in three-factor solution was successful in recovering the three subscales as proposed. A small positive relationship was present ($r = .352$) between subscales of Benefits and Nurses' Support but no significant relationship between Benefits or Nurses' Support with Concerns was identified. The results indicated that nurses had high positive attitudes regarding Benefits and Nurses' Support and low negative attitudes towards Concerns in promoting IM in the NICU.

Specific Aim 1 examined NICU nurses perceptions regarding benefits of, concerns and issues with, and nurses' support in promoting IM for preterm infants in the NICU. Results at the item and TMS for all three subscales indicated high positive attitudes regarding Benefits and Support and low Concerns.

Specific Aim 2 examined the relationships across demographic variables (age, years in nursing practice, years in NICU practice) between benefits for infants and parents, concerns, and nurses' support as well as relationships between the three study dimensions. Pearson correlation coefficient results showed that there was a small significant positive correlation between age, experience in nursing, and experience in NICU nursing with Concerns TMS. No significant relationships were noted between age, experience in nursing, experience in NICU nursing and benefits for infants and parents or nurses' support. Partial correlational analysis examining the

relationship between Benefits TMS for infants and parents, Concerns TMS, and Nurses' Support TMS, with and without controlling for age, found no effect for age and revealed a small significant relationship between Benefits and Nursing Support and no significant relationship between Benefits and Concerns and Concerns and Nurses' Support. Results indicated that participants can hold attitudes about their concerns that are unrelated to their willingness to endorse or support IM as proposed by the Dual Attitudes model.

Specific Aim 3 examined the differences across demographic groups (ethnicity and education) in the attitudes of NICU nurses regarding IM for preterm infants after controlling age. After controlling for age, no differences were found across ethnic or education groups on benefits, concerns, and nurses' support in promoting IM.

Chapter 5: Conclusions, Discussions, and Recommendations

In this chapter, major findings from the study are discussed related to the instrument developed, conceptual model, and existing literature. Study limitations, recommendations for future research, and implications for nursing are discussed.

PSYCHOMETRIC FINDINGS

As mentioned in the previous chapters, there was no instrument that had been developed to measure the attitudes of NICU nurses regarding preterm IM. AIMS was a newly developed instrument that consisted of three subscales: Benefits, Concerns, and Nurses' Support in promoting preterm IM in the NICU. Reliability and factor analyses were conducted. The Cronbach's alpha for Total Scale was $\alpha = .935$; the subscales: Benefits $\alpha = .973$; Concerns $\alpha = .867$; Nurses' Support $\alpha = .712$. Nunnally (1978) recommended that instruments used in basic research have reliability of about .70 or better. Thus, all reliability values were satisfactory and acceptable to use for further studies. However, as the item "*Nurses should remain with parents*" was not adhering with other items in the nurses' support section, removal of that item could have improved the alpha to .818 for that subscale, Nurses' Support, and total scale to .938.

Factor analyses explored both orthogonal (varimax) and oblique (oblim) rotations and explored the factor structure using three rules: eigenvalue ≥ 1 ; a forced factor solution based on the scree plot; and a forced factor-varimax with four factors, varimax with three factors, oblim with four factors were tested. Principal components force factor analysis with an oblim rotation successfully recovered the three proposed subscales as constructed. Both Cronbach's item analyses and factor analyses suggested some redundancy was present in the Benefits subscale offering opportunities for item reduction in addition to the revision or deletion of the "*Nurses*

should remain with parents” item. With these revisions, AIMS could be utilized in future studies to assess the attitudes of other health care professionals, occupational/physical therapists, and neonatologists who are dealing with preterm infants in the NICU.

DUAL ATTITUDES MODEL

Cacioppo et al. (1997) argued that dual attitudes occurred when people had different evaluations of the same attitude in memory. The pattern of response scores reflecting positive attitudes for benefits and support for IM and very minor negative attitudes regarding concerns and issues would seem at first glance to suggest a unidimensional attitude. However, the failure to find any significant relationship between the Concerns subscale with either Benefits or Nurses’ Support subscales indicated that participant attitudes on Concern was completely independent on the other two. The small significant relationship between age and Concerns suggested that older nurses may have more reservations with the intervention, reflecting a practice bias based on familiarity. Yet even these participants, while expressing concerns, also expressed high positive attitudes supporting the Dual Attitude Model for a subset of participants.

STUDY FINDINGS

Several notable findings emerged from this study. An examination of NICU nurses’ perceptions regarding the benefits of, concerns and issues with, and nurses’ support for promoting IM for preterm infants in the NICU found high mean scores on the benefits (mean = 4.13) and nurses’ support (mean = 4.11), which clearly indicated that a majority of NICU nurses perceived positive benefits of IM and support in promoting IM in the NICU to facilitate maternal-infant attachment. This finding reflected similar positive attitudes for use of kangaroo care to promote bonding (Chia et al., 2005).

The pattern of small positive relationships between demographic variables (age, years in nursing practice, years in NICU practice) and the Concerns scale indicated that older and more experienced NICU nurses perceived some hindrances or limitations (concerns) in performing IM in the NICU. However, no relationships were found between these demographic variables and benefits or nurses' support, indicating that these demographic variables did not influence positive attitudes of NICU nurses.

The unsurprising positive relationship found between both positive dimensions of IM but not between positive attitudes and negative attitudes (i.e., with concerns) was consistent with the conceptual model of dual attitudes. Finally, neither ethnicity nor education appeared to play a role in either positive or negative attitudes.

CONCLUSIONS AND NURSING IMPLICATIONS

Preterm birth may encompass an overwhelming experience of fear, anxiety, and hopelessness for parents. Research studies have indicated that parental stress may be reduced through individual developmental care programs in the NICU such as IM (Browne and Talmi, 2005; Feijo & Piccinini, 1998; Feijo et al., 2006; Onozawa et al., 2001; Oswalt, 2009). When parents provide massage for their preterm infants, they feel relaxed, reduced anxiety, improved depression mood, and enhanced maternal-infant attachment. Nurses have been shown to be critical factors in the support, engagement, and encouragement of parents to touch and massage their infants in the NICU, which, in turn, may improve outcomes for both the parents and the infant (Bond, 2002; Correia & Linhares, 2007). Thus, the attitudes of NICU nurses regarding preterm IM are of vital importance. However, no study has systematically sought to identify the attitudes of NICU nurses regarding the use of IM for preterm infants. This study was designed to address that gap and inform effective implementation of IM to enhance maternal bonding with

preterm infants.

The study results indicated that older nurses and nurses with more years of experience in nursing and NICU nursing were more likely to hold some low level negative attitudes (concerns) in promoting IM in the NICU. However, the majority of participants also endorsed benefits and support of IM at a high degree. Stimulation and encouragement of early contact between mother and preterm infant has been repeatedly shown to enhance the bonding and attachment, parenting confidence, and maternal care-giving skills (Ferber et al., 2005; Loo et al., 2003; Mercer, 2004). The presence of high endorsement of the Benefits and Support scales suggests that the benefits of IM are readily and widely recognized. This suggests that addressing the negative attitudes, i.e., removing barriers, may be more effective in promoting adoption of IM for preterm infants than efforts to increase already highly favorable attitudes as suggested by Wilson et al. (2000).

Exploring neonatal nurses' attitudes regarding IM has contributed to the understanding of which attitudes held (positive or negative) may contribute more strongly to reluctance or hesitation for adoption. Understanding NICU nurses' attitudes regarding preterm IM has provided critical information for the development and implementation of an effective therapeutic program involving IM for preterm infants to promote maternal-infant bonding. Reservations may be more strongly held by those nurses who are comfortable with long-held practice habits and more resistant to newer models of intervention that contradict prior models of practice, e.g., minimal stimulation. Thus, efforts should also include evidence based practice information that address these changes in clinical efficacy. Lastly, efforts should be made to minimize workplace burden to implement such interventions. Chia et al. (2005) stated that staff education aimed at encouraging nurses to routinely promote kangaroo care can enhance parent-infant attachment and parental involvement in the care of their infants—the same can be applicable to IM. NICU nurses can be

encouraged to attend training on IM at a reputed IM training center e.g., International Association of Infant Massage (IAIM). In-service education for NICU nurses can be conducted to impart the knowledge and skills on IM with a special focus on older nurses who may have stronger reservations with interventions that contradict the minimal stimulation model of practice. Institutional barriers (e.g., workload, space to promote IM, parent instruction) can also be actively addressed to further minimize the negative concerns.

LIMITATIONS AND FUTURE STUDY RECOMMENDATIONS

Although there were three methods adopted to recruit NICU nurses all over the U.S through the NANN, ANN, and commercially purchased e-mails, participation was sparse and the study sample may not be representative of a national sample. Sheehan (2001) stated that nurses' participation rates in research have been known to be low. However, it appears that purchased e-mail addresses may be even less effective than in the past possibly due to more highly sensitive spam filters and solicitation exhaustion via this medium. A better plan for the future survey research pertaining to NICU nurses might be to obtain permission from the pediatric nursing and neonatal nursing organizations to access the members who attend their conferences and distribute the survey questionnaire at the conferences. Furthermore, efforts should be made to explore attitudes broken down across state, regional, and local NICUs in future studies because organizational and geographical differences may play a significant role in attitudes.

The use of qualitative studies should also be considered because face-to-face interviews and participant observation would contribute to understanding the personal opinions of the nurses regarding IM for preterm infants in the NICU.

There were no studies that explored NICU nurses attitudes regarding IM, so comparisons with prior findings were not possible. In addition, this study used a newly developed instrument,

AIMS, for which psychometric analyses have suggested some possibilities for modest improvement.

This study was limited to exploring NICU nurses' attitudes only. There are other healthcare professionals, such as neonatologists and occupational/physical therapists, who are also responsible for promoting IM in the NICU and who should also be surveyed. Neonatologists are instrumental in making hospital protocols and policies and typically nurses' actions depend on neonatologists' treatment orders inside the NICU. Hence, assessing attitudes of neonatologists regarding IM would provide essential information that may impact support for hospital policies to introduce IM in the NICU.

This study clearly showed that some NICU nurses have concerns with promoting IM. A close examination of the concern items in Table 4.10 indicated only three items had mean scores slightly in the agree direction—negative attitudes towards FCC, inadequate spacing in the NICU, and added burden to NICU nurses. While suggestive, the study did not identify the exact nature of the barriers against adoption of IM in the NICU. Thus, future studies could be directed towards identifying the concerns in detail and soliciting suggestions from stakeholders for remediation.

Appendix A: E-mail Invitation

Dear Participant,

My name is Malli Jambulingam and I am a practicing NICU nurse working on my doctorate from the University of Texas Medical Branch (UTMB). My dissertation research project is about how the attitudes of NICU nurses play a critical role in what kinds of care we support for our neonatal patients. Of special interest to me is how NICU nurse perceive infant massage for preterm infants. As a fellow NICU nurse, you are the expert I seek to complete a short online survey for the study entitled, "Neonatal Nurses' Attitude Regarding Preterm Infant Massage".

We know that parents of premature infants are often distressed and overwhelmed when their infant is admitted to the NICU and need the support of the NICU nurses to dispel their concerns about attachment with their infants. We also know that when mothers touch and connect with their infants, their interaction and attachment is enhanced. Although the literature reports many benefits for infants, mothers, and family from infant massage, it is not widely practiced in most NICUs. As care providers of preterm infants, your attitudes and beliefs would clearly play a major role in involving parents in providing touch and massage their preterm infants in the NICU.

Therefore, it is critical to understand how NICU nurses perceive the benefits, concerns, and support for infant massage for preterm infants. Your feedback as a member of this nursing community is very important. Please take 10-15 minutes to complete the anonymous survey. Your participation in this survey constitutes consent.

Just click here on the link below. If you have any questions, feel free to contact me. I would be delighted to talk to you.

https://www.surveymonkey.com/s/NICUNursesAttitudes_InfantMassage

Thank you ahead of time for your participation,

Malli Jambulingam RN, MSN, CEIM

Academy of Neonatal Nurses (ANN) - E-mail Invitation

Research Corner

ANN is pleased to support efforts to enhance knowledge and its application to practice by making ANN members aware of opportunities to participate in IRB approved research studies.

IRB approval is reviewed and kept on file and surveys are vetted by our education committee. If you are an ANN member seeking to distribute a survey through our newsletter more information can be found here.

Research Study on "Neonatal Nurses' Attitudes Regarding Preterm Infant Massage"

We know that parents of premature infants are often distressed and overwhelmed when their infant is admitted to the NICU and need the support of the NICU nurses to dispel their concerns about attachment with their infants. We also know that when mothers touch and connect with their infants, their interaction and attachment is enhanced. Although the literature reports many benefits for infants, mothers, and family from infant massage, it is not widely practiced in most NICUs. As care providers of preterm infants, your attitudes and beliefs would clearly play a major role in involving parents in providing touch and massage their preterm infants in the NICU.

Therefore, it is critical to understand how NICU nurses perceive the benefits, concerns, and support for infant massage for preterm infants. Your feedback as a member of this nursing community is very important. Please take 10-15 minutes to complete the anonymous survey.

If you have any questions, feel free to contact principle investigator Malli Jambulingam at majambul@UTMB.EDU

https://www.surveymonkey.com/s/NICUNursesAttitudes_InfantMassage

National Association of Neonatal Nurses (NANN) - E-mail Invitation

Dear Fellow NANN Members,

I am conducting my dissertation project, Neonatal Nurses' Attitude Regarding Preterm Infant Massage, on gathering the feedback of fellow NICU nurses regarding the perceived benefits, concerns, and support for infant massage for preterm infants.

Your voluntary participation in this research study is respectfully asked as your perspective and opinions are critical to an accurate assessment regarding the benefits and challenges of utilizing infant massage for preterm infants.

Please click here: https://www.surveymonkey.com/s/NICUNursesAttitudes_InfantMassage

Appendix B: The Attitudes of Infant Massage Scale (AIMS) Survey Questionnaire

I. Demographic Questionnaire

1.	Are you male or female?
2.	How old are you?
3.	What is your primary ethnicity? 1. Non-Hispanic White 2. Black or African American 3. Hispanic or Latin 4. American Indian or Alaskan Native 5. Asian Native Hawaiian or other Pacific Islander
4.	What is your highest level of education in nursing? 1. Diploma 2. Associate degree 3. BSN 4. MSN 5. DNP 6. PhD Other, Please specify _____
5.	How many years of experience do you have in nursing? _____
6.	How many years of experience do you have as a NICU nurse? _____
7.	Have you heard of using infant massage for preterm infants? Yes 2. No
8.	Have you had training on infant massage? Yes 2. No
9.	If yes, in what form did you first receive the training or continuing education? 1. Part of my nursing education 2. Infant Massage USA Conference 3. In-service presentation at my place of employment 4. Website 5. Journal Article 6. Healthcare Provider 7. Physical or Occupational Therapist Other (Please specify)
10.	Have you ever seen infant massage used in the NICU? Yes 2. No
11.	Have you personally ever used infant massage for preterm infants in the NICU? Yes 2. No
12.	If yes, how many years of experience have you had in using infant massage for preterm infants in the NICU? _____
13.	How often do you use infant massage for preterm infants: Never 2. Rarely 3. Sometimes 4. Often

II. Please indicate to what extent you agree that an item represents a benefit of promoting infant massage for preterm infants in the NICU

No.	A. Benefits for Preterm Infants	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1.	Massage promotes interaction between parents and their infants in the NICU by					
1a.	providing early contact between parents and infant					
1b.	providing one-to-one quality time					
1c.	providing undivided attention					
1d.	providing nurturing touch					
1e.	promoting bonding between mothers and infants					
1f.	promoting secure attachment					
1g.	promoting verbal/non-verbal communication					
1h.	Promoting love and respect between parents and infants					
2.	Massage helps preterm infants through the stimulation of					
2a.	Language development					
2b.	Improved growth and development					
3.	Massage helps preterm infants for the relief of					
3a.	Gas and colic					
3b.	Constipation/elimination					
4.	Massage helps preterm infants for relaxation that is demonstrated by					
4a.	Reduced stress					
4b.	Improved sleep patterns					
4c.	Being calm					
	B. Benefits for Parents					
5.	Infant Massage helps parents in					
5a.	Decreasing stress					
5b.	Decreasing anxiety					
5c.	Decreasing postnatal depression					
5d.	Stimulates lactation					
5e.	Improves parenting skills					
5f.	Improving self-esteem					
5g.	Improving confidence in her preterm infant's care					
5h.	Improving bonding with infant					
5i.	Involving fathers in infant's care					

III. Please indicate to what extent you agree that an item represents a real concern with promoting infant massage for preterm infants in the NICU

No.	Concerns and Issues	Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1.	Goes against a minimal-stimulation policy in the hospital					
2.	Lack of knowledge and skills on proper method of infant massage					
3.	Lack of time due to staff shortages					
4.	A negative attitude of neonatal staff regarding FCC					
5.	Nurses' busy schedules					
6.	Inadequate spacing in the NICU to perform infant massage					
7.	Nurses' fear of over-stimulation of preterm infants					
8.	Lack of confidence in teaching infant massage to the parents					
9.	Maternal fear in handling and massaging their infants					
10.	Facilitating massage to preterm infants is an added burden to NICU nurses					
11.	Risk of interfering with equipment (e.g., arterial and venous lines, endotracheal tubes), hyperthermia.					

IV. Please indicate to what extent you would support infant massage for preterm infants in the NICU

No.	Nurses' Support for Infant Massage	Strongly Agree	Disagree	Uncertain	Agree	Strongly Agree
1.	All parents should be encouraged to touch and massage their preterm infants in the NICU					
2.	All parents should be given relevant information on IM					
3.	Nurses should remain with parents for support and assistance during massage of their infants					
4.	Facilitating IM for preterm infants in the NICU is professionally satisfying					

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