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Weight, Temperature, and Transcutaneous Bilirubin of the Term Neonate at Discharge: A Comparative Study Between a Traditional Nursery and Rooming-in Model of Care

Jennifer L. Pass
Kennesaw State University, jpass5@students.kennesaw.edu

WEIGHT, TEMPERATURE, AND TRANSCUTANEOUS BILIRUBIN OF THE TERM NEONATE AT DISCHARGE: A COMPARATIVE STUDY BETWEEN A TRADITIONAL NURSERY AND ROOMING-IN MODEL OF CARE

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JENNIFER PASS

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ABSTRACT

Purpose: The purpose of this study was to examine day of discharge term neonate outcomes of percent weight change, body temperature, and transcutaneous bilirubin from a traditional nursery and a rooming-in model of care.

Design: A retrospective, descriptive, comparative design was used, comparing two groups for differences between outcomes.

Methods: A total of 102 electronic neonate records from one hospital in north Georgia were examined and divided based on when the model of neonate care changed from the traditional nursery care setting to full rooming-in, which was early November 2010: Group 1 (traditional care) consisted of 51 term neonates discharged from August 2010 through October 2010; Group 2 (rooming-in) consisted of 51 term neonates discharged from November 2010 through February 2011.

Results: A one-way ANOVA revealed there was no statistically significant difference for neonates' percent change in weight between the traditional nursery group and the rooming-in group, $F(1, 100) = 1.70$, $p = .195$. In addition, no significant difference was found for neonates' discharge temperature or discharge transcutaneous bilirubin level between the two groups, $F(1, 100) = 0.003$, $p = .953$ and $F(1, 100) = 0.000$, $p = .985$, respectively.

Conclusions: These study findings suggest term neonates cared for by their mothers in rooming-in settings have similar biometric measurements as neonates cared for by nurses in traditional nurseries. This strengthens the case for hospitals to either continue the practice of rooming-in or to transition to rooming-in if currently practicing within the traditional nursery setting.

Keywords: Bilirubin, birth-weight, discharge weight, rooming-in, temperature, traditional nursery care, transcutaneous bilirubin

CHAPTER 1: INTRODUCTION

Identifying evidence to support nursing practice in maternal and infant care is needed as third party payers have become increasingly focused on core measures defined outcomes. While there have been many studies examining maternal and infant care practices, including the transition from a traditional nursery model to a rooming-in model, there are few studies examining outcomes of the two major neonatal models of care (rooming-in and traditional nursery care).

Rooming-in is the term used for the family-centered model of care which allows newborns to remain in their mothers' room from birth through newborn admission procedures, maternal recovery, and newborn transition to extra-uterine life. All care including examination by the pediatrician and assessment by a nurse caring for both mother and baby is done in the room. The mother-baby "couplet" is allowed to remain together for the duration of the hospital stay when stability of both patients is assured (Mullen, Conrad, Hoadley, & Iannone, 2007). The Institute of Medicine defines patient family-centered care as "care that is respectful and responsive to patient preference, needs and values, and ensures that patient values guide all clinical decisions" (as cited in Abney-Roberts & Norman, 2012, p. S107). The term baby-friendly comes from the World Health Organization and United Nations Children's Fund (UNICEF) Baby-Friendly Hospital Initiative of 1991 (Baby-Friendly USA, 2012). The initiative is a global effort to improve practices that protect, promote, and support breastfeeding.

Several studies have been published that examine hospital transition from traditional nursery care to rooming-in and found mixed results. One study (Rodgers, 2012) found that staff in the facility examined both welcomed and promoted the change. Employees reported increased job satisfaction and improved patient satisfaction scores. Two neonatal improvements were

increased breast milk feeding rates and improved thermoregulation. Conversely, it was noted that pediatricians continued to prefer to check the baby in the nursery rather than in the mother's room (Rodgers, 2012). Another study (Young, 2012) evaluated staff attitudes before and after the movement toward being a baby-friendly hospital with less separation of parents and infants. Eight pediatricians, four obstetricians, and twenty-eight nurses were given pre- and post-test knowledge/attitude surveys in regard to baby-friendly care. The findings indicated that education on the provision of baby-friendly maternity care made a significant impact on the knowledge and attitudes of the majority of the participants (Young, 2012). Trajkovski, Schmied, Vickers, and Jackson's 2012 study found that nurses had a knowledge of the importance and challenge of delivering family-centered care in a maternity setting, but still needed organizational support and ongoing education to assist them in the provision thereof. Another study examined the impact of two different types of neonatal care on staffing ratios, and how nurses may influence the mothers' attitudes toward each model of care (Svensson, Matthiesen, & Widstrom, 2005). From a maternal perspective, a Swiss study found that mothers reported severe tiredness if they could not leave infants with health care personnel for several hours during the night (Svensson et al., 2005). This same study noted that mothers tended to leave their babies in the nursery at night because they perceived that the nurses thought this best. The researchers concluded that "negative staff attitudes toward night rooming-in may implicitly suggest to mothers that closeness between mothers and babies is not important" (Svensson et al., 2005, p. 99).

One study that evaluated patient outcomes since implementation of rooming-in looked specifically at the impact of rooming-in on breastfeeding success and duration (Jaafar, Lee, & Ho, 2012). Results showed that rooming-in infants had slightly more breastfeeds a day (8.3)

than those cared for in a nursery setting (7). Even though the rooming-in group reported more infants being exclusively breastfed on day 4, there was no statistical difference in the duration of breastfeeding for the two care groups.

A study on weight loss in a baby-friendly hospital showed that, although breastfed infants had a higher overall weight loss than bottle-fed babies, there were no infants who lost more than 10% of birth weight while being cared for in a baby-friendly hospital (Grossman, Chaudhuri, Feldman-Winter, & Merewood, 2012). Jaundice and readmission rates for phototherapy were reduced among infants cared for by their parents, and neonates experienced shorter duration of phototherapy and recovered faster than neonates whose parents could not remain with their infants while hospitalized (Samra, El Taweel, & Cadwell, 2012). A study on both weight loss and jaundice rates in term newborns in partial versus full rooming-in found similar outcomes in weight and bilirubin levels for the two groups in the study (Zuppa et al., 2009).

Bystrova et al. (2003) reported that different delivery ward routines influenced temperature in newborns, specifically the practice of skin-to-skin contact between mother and baby. The infants held skin-to-skin after birth and during breastfeeding reached an adequate body temperature sooner and maintained warmth slightly better than the swaddled babies giving another support for having time spent with the mother as occurs with rooming-in.

While the summary of studies just presented found evidence supporting the efficacy of rooming-in care versus traditional nursery care, there is a need to replicate studies that are similar but compare all three biometric values – weight, temperature, and transcutaneous bilirubin - so that the two models of care may be evaluated in a side-by-side comparison based on the findings. The remainder of this chapter presents the purpose of the present study. This chapter also discusses the background and significance of the study, provides a statement of the problem, and

discusses the theoretical framework used to guide the study. In addition, this chapter presents the research question, definitions, assumptions, and limitations of the study.

Purpose

The purpose of the present study was to examine the differences in outcomes (percent weight change, body temperature, and transcutaneous bilirubin of term neonates at discharge) between two models of in-hospital neonate care - traditional nursery care compared to rooming-in - in a small hospital in North Georgia. Weight, axillary temperature, and transcutaneous bilirubin on the day of discharge were examined for comparison. It is important to evaluate methods of care delivery in terms of patient outcomes, and little is known in regard to differences between these two care models when patient outcome data are compared. There is a need for more studies to be done in the United States (U.S.) for the purpose of comparison data in regard to patient outcomes where care of the term neonate is concerned. As the temperature has been studied, and weight and jaundice have been studied jointly as indicators of neonatal patient outcomes, the present study included percent weight change, transcutaneous bilirubin value, and body temperature of term neonates from each model of care on the day they were discharged from the hospital.

Background and Significance

The change from standard nursery care to rooming-in has evolved since the 1960's, with the formation of consumer groups who advocated for family-centered maternity care (Phillips, 1999; Zwelling & Phillips, 2001). The International Childbirth Education Association was formed, and the co-presidents of the organization authored a manual in 1968 entitled *Implementing Family-Centered Maternity Care with a Central Nursery* (Zwelling & Phillips, 2001). Maternity patients and their families became increasingly aware. As birth was impacted

by the advent of technological advances, women and their partners began to seek more relaxed and natural environments for giving birth. As information about bonding and attachment came to light, so did the need for restructuring of the birth environment (Zwelling & Phillips, 2001).

In 1981, the United States Department of Health and Human Services recommended the "development of operational and staffing policies, environment and design of space, and a philosophy of care that reflects the development and psychosocial needs of children and families" (as cited in O'Mara, 1999). In 1991, the World Health Organization and UNICEF introduced the Baby-Friendly Initiative, including the "Ten Steps" in support of promoting successful breastfeeding (Baby-Friendly USA, 2012). Despite the fact that Step # 7 recommends that mother and baby should remain together day and night during the hospital stay, it was estimated by 1996 that mother/baby nursing, another name for the practice of rooming-in, was practiced in only 60% of U.S. hospitals (Zwelling & Phillips, 2001).

Whereas family-centered care has been implemented and investigated in the past several decades, including the practice of neonatal rooming-in, investigators have only recently begun to research systematically for the evidence base for practice. As stated previously, neonatal outcomes have been studied individually and in pairs, but not as the triad (i.e., percent weight change, body temperature, and transcutaneous bilirubin) in the present study.

Statement of the Problem

In keeping with the family centered model, rooming-in is optimal for bonding of parents and neonates. The particular research problem of interest has been whether or not there are measurable differences in outcomes for weight changes, body temperature, and transcutaneous bilirubin values between the neonates cared for in a traditional nursery setting and the neonates cared for in a rooming-in setting. Not only were data similar to previous studies collected in an

attempt to replicate findings, but the combining of data from the three outcomes has the potential to better highlight the comparison of the two models of care.

Theoretical/Conceptual Framework

The theoretical and conceptual framework selected to guide this study was the Universe of Developmental Care (UDC) model, which was introduced by Gibbins in 2008 (Gibbins, Hoath, Coughlin, Gibbins, & Franck, 2008). Permission was given to use the framework and illustrations by the author of the framework (Appendix A), which is illustrated in Figure 1. Gibbins et al. (2008) argued the shared surface that interfaces the body and environment, versus the brain, should provide the conceptual foundation for neurodevelopmental care. Thus, they proposed a new model, the UDC, which "recognizes the multidimensionality of the caring environment and the pivotal relationship of the infant, family, and caregiver" (p. 146). The central body, or planet, in the model represents the infant. The family is then represented by the totality of the nine planets orbiting around the central one, or the infant. The hospital staff is the planet orbiting around the family *and* infant. Lastly, the environment is represented by one planet that circles them all.

In the UDC model, the skin is considered the interface between the body and the environment, which links to the developing brain on one hand and to the external world on the other (Gibbons et al., 2008). The skin represents the shared point of contact in two distinct yet integrated ways. At the basic level, the skin is the direct point from which the nervous system processes the infant's environment. In addition, the skin is also where the caregiving of the family is impacted by the supportive network of the hospital staff.

The UDC model has implications at both individual and institution levels. Core measures specific to each planet can be identified and strategies to meet each measure can be practiced

(Gibbons et al., 2008). Based on a review of the literature regarding developmentally supportive care and quality caring practices in the neonatal population, the UDC model was formulated with five disease-independent core measures of quality that are patient centered and frequently nursing driven (Coughlin, Gibbins, & Hoath, 2009). The creation of these core measures represented a first step in standardizing evidence-based developmentally supportive care practices. The core measures, which are essential to promoting healthy growth and development of the infant and family, include protected sleep, pain and stress assessment and management, activities of daily living (positioning, feeding, and skin care), family centered care, and the healing environment (Coughlin et al., 2009).

With regard to the present study, the UDC model can be applied to the rooming-in model of care in that it is holistic, universal, and patient-centered, and the care of the infant by the parents and family under the guidance of the hospital staff incorporates all of the care practices represented by the other planets. Caregiving activities within several of the UDC model's core measures may influence the three outcome variables evaluated in this study: percent weight change (e.g., feeding, nutrition), body temperature (e.g., skin-to-skin care), and transcutaneous bilirubin (e.g., feeding, nutrition, elimination).

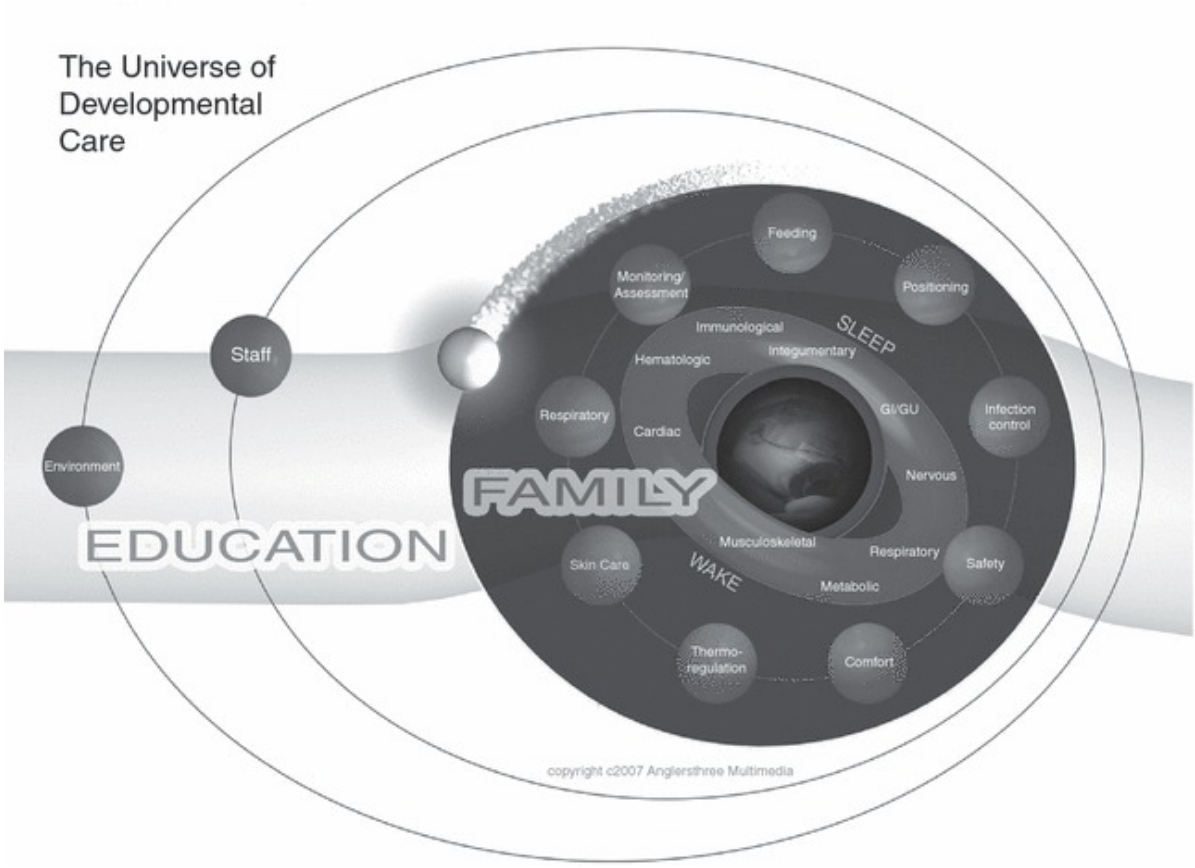

Figure 1. The Universe of Developmental Care Model (Gibbins et al., 2008).

Philips Healthcare adapted the five core measures introduced in the UDC model and incorporated feedback from nurses and healthcare providers across the world to create the Neonatal Integrative Developmental Care Model (IDC; Philips, 2016). This model simplified the UDC model and created a user friendly interface with developmental principles to guide practice. Not only does this model reflect the developmental needs of the premature or sick infant in the neonatal intensive care unit (NICU), but it also begins to cross the continuum from pregnancy, labor and delivery, postpartum, and into the pediatrics areas (Altimier, 2011). The center of the IDC model represents the healing environment and incorporates both the sensory system and physical environment (i.e., touch, smell, taste, sound, and light) (Philips, 2016). These promote growth and development of the infant to safeguard his/her transition to life

outside the womb. The petals around this circular central area represent the more extrinsic activities that support the infant, including partnering with families, positioning and handling, protecting skin, minimizing stress and pain, optimizing nutrition, and safeguarding sleep (Philips, 2016). The basic idea undergirding this model is that the mother and family have what they need to care for their child and need only the correct balance of guidance and encouragement to do so. Similar to the UDC model, the Philips' IDC model is also relevant to the present study. It applies to the rooming-in model of care given it is holistic and family-centered, and several elements in the model relate to and potentially impact the variables measured in this study (e.g., optimizing nutrition, safeguarding sleep, and partnering with families).

Research Question

The research question for the present study was:

Do term neonates cared for by their mothers in a rooming-in setting have similar health outcomes at discharge measured by percent weight change, body temperature, and transcutaneous bilirubin levels compared to term neonates cared for in a traditional nursery care setting?

Independent variable: type (model) of care setting.

Dependent variables: 1) Percent weight change, 2) Body temperature, 3) Transcutaneous bilirubin value - all measured on the day of discharge.

Conceptual & Operational Definitions

The following are terms used frequently throughout this paper with their conceptual or operational definitions:

Neonate (term): an infant born between the 37th and 40th week of gestation.

Pre-term: an infant born at 36 weeks, 6 days or less gestation.

Post-term: an infant born at more than 40 weeks gestation.

Normal spontaneous vaginal delivery: a vaginal delivery without further assistive intervention than an episiotomy, with or without neuraxial anesthesia such as epidural or spinal.

Percent weight change: calculated as follows: 1st) subtract the neonate's discharge weight from the birth weight; 2nd) multiply this result (i.e., the difference) by 100; and 3rd) divide this figure by the birth weight.

Transcutaneous bilirubin (TCB): the measurement of the amount of bilirubin deposits in neonatal skin; measured on the forehead just above the mid-brow line, or on the sternum.

Temperature: axillary thermometer measurement of the neonate's body temperature.

Traditional nursery care: the care given to neonates prior to the transition of many hospitals to rooming-in. In this setting neonates are primarily cared for by nursing staff and taken to their mothers at feeding times at fairly regular intervals. In this model, neonates tend to remain in the nursery at night between brief visits to their mother for feedings. If the neonate is bottle fed he/she may remain in the nursery through the night so that the mother may get an uninterrupted night's rest.

Rooming-in: a type of family-centered care received by neonates who remain in their mothers' rooms from birth to discharge. Care is primarily administered by the mother, with the nurse overseeing both mother and neonate while assisting with care and education where needed.

Uncomplicated pregnancy: a pregnancy of average length gestation, not impacted by maternal morbidity such as hypertension, diabetes, or underlying chronic disease such as that of the heart, blood vessels, kidneys, liver, or lungs.

Assumptions

Two assumptions were identified regarding this study. It was assumed that the neonates in each cohort group were weighed on the same scale, and had body temperature and TCB measurements performed with accurate equipment and procedure.

Limitations

Limitations anticipated in the present study were that, while all neonates were first live births for their mothers, there were some natural variances in the course of healthy term pregnancy, labor, delivery, and the immediate postpartum recovery period. Length of labor, receipt of neuraxial anesthesia, and fluid intake can vary and could not be controlled for in this study. Cases included in the study were accessed in patient records from previous years and only one small hospital obstetrical unit in a small rural community was examined. Additionally, as a descriptive study, findings are descriptive so inferences cannot be made and therefore generalization to other regions or areas is recognized as a limitation. Intravenous fluid boluses are typically given to the patient who receives an epidural or spinal, but only in the event of signs or symptoms of dehydration or other complicating factors in mothers who deliver naturally without anesthesia. Examples of these signs and symptoms are reduction in maternal blood pressure, increase in maternal body temperature, and fetal or maternal tachycardia or bradycardia. Furthermore, one study showed "evidence that maternal IV fluids during parturition are related to neonatal output and weight loss" (Noel-Weiss, Woodend, Peterson, Gibb, & Groll, 2011, p. 9). The same study discussed that the rate of diuresis varies maternally, as well as in the fetus and neonate. Obviously these factors can impact newborn weight and clearance of bilirubin through the kidneys and liver. Although it is assumed that all weights were on the same scale and measurements were done on accurate equipment using accurate

procedures, reality is that all equipment has some measurement error and there is typically variability among healthcare professionals in taking measurements. This could affect reliability of results. Lastly, there are several demographic characteristics which were not collected on the mothers and neonates to determine whether the two groups were similar or not on other variables that could not be controlled for in this study.

CHAPTER 2: REVIEW OF THE LITERATURE

This chapter presents literature that supports the purpose of the present study and is guided by the research question. The chapter begins with a historical overview of inpatient maternal and infant care. The next portion of the chapter discusses bonding between the mother and her infant. Some of the benefits of rooming-in are presented. Lastly, there is discussion on previous research concerning body temperature, weight, and transcutaneous bilirubin screening of the neonate.

Historical Perspective

Since the birthing of a new baby moved from the home to the hospital at the turn of the 20th century there has been remarkable redesign of the neonatal healthcare setting based on research (Thomas, 2008). Whereas home births were family oriented, the move to the hospital signaled the beginning of many new concepts. The move was designed for safety and protection, but the resulting care and treatment became at times rigid. Safer artificial feeding led to decreased breastfeeding rates and the feeding of babies by nurses in aseptic nurseries in lieu of by parents in the mother's room. It must be credited to those early practitioners of medicine that poor access to infection control measures, primarily antibiotics not yet developed, caused them to practice a protective type of medicine. This sterile attitude was accepted as the necessary order of progress. Birth became a medicinal procedure that concentrated on delivery rather than birth (Thomas, 2008).

During the post-World War II baby boomer generation era, psychological theories on infants challenged the practice of the rigid separation of mother and infant, and the rooming-in practice was introduced. An experimental program of rooming-in was begun at Yale-New Haven Hospital. Family-centered care was considered a radical departure from conventional

medical care, and there were questions about its safety (Zwelling & Phillips, 2001). As early as 1948 the magazine *Woman's Day* published an article by Ripperger titled, "Whose Baby Is It?". The author claimed that "the hospital takes over and you conform" and encouraged readers to ask for rooming in because "the baby belongs to you and not to the hospital" (as cited in Phillips, 1999, p. 7).

In 1953, the British psychiatrist, John Bowlby, spawned the attachment theory when he claimed in his book, *Child Care and the Growth of Love*, that "children suffer catastrophically when they experience…maternal deprivation" (as cited in Phillips, 1999, p. 7). Upon receipt of this information, more women requested the rooming-in experience. In 1959 another book, *Family Centered Maternity Nursing*, was published by a certified nurse midwife by the name of Ernestine Wiedenbach. Wiedenbach challenged conventional nursing practice by encouraging nurses to provide supportive nursing care based on recognizing and understanding the needs of each mother, father, infant, and family. Around this same time, a nurse manager by the name of Hennel wrote of family centered maternity nursing and its philosophy in a hospital maternity program in 1956. Hennel began the process by handpicking all her staff, even the housekeeping employees, according to their belief in family-centered care and willingness to practice in a family-centered manner (Phillips, 1999).

In 1976 a study by Klaus and Kennell showed the significance of physical contact between parents and their newborns (as cited in O'Mara, 1999). The study highlighted just how critical are the first hours after birth. Bonding and attachment theory highlights the importance for the development of a sense of trust. This trumped the old ways of the infant's needs not being at the front and center of the household. There was a change from structured, almost

scheduled infant care to infant led and cued care from the parents (Kurth, Spichiger, Stutz, Biedermann, Hosli, & Kennedy, 2010).

Next, a single room system for labor, delivery, and postpartum care was recommended by the Cybele society, a group founded to research and promote family-centered maternity care (Zwelling & Phillips, 2001). Single room maternity care was further driven by concerns over staff shortages and cost effectiveness. Staff began to be cross-trained in all areas of maternal-infant care.

In 1991, the World Health Organization and UNICEF introduced the Baby-Friendly Initiative, including the "Ten Steps" in support of promoting successful breastfeeding (Baby-Friendly USA, 2012). Despite the fact that Step # 7 recommends that mother and baby should remain together day and night during the hospital stay, in many countries they are still separated after birth and rooming-in is not always practiced around the clock (Svensson et al., 2005).

An inadequate start to breastfeeding can cause increased weight loss related to reduced caloric intake in the first few days of life and may be associated with increased serum bilirubin levels. The slowdown of meconium passage is believed to increase intestinal absorption of bilirubin (Zuppa et al., 2009). These two parameters of study can be largely impacted by the type of care the infant receives, specifically whether the infant remains with the mother in the first alert hours after birth so that breastfeeding may be initiated.

Phillips (1999), a champion of the family-centered maternity care concept, stated "parenthood is the most important role in life" (Phillips, 1999, p. 7). Parents through the influence of their parenting practices help determine children's mental health. Relationships in early childhood have a tremendous impact on later development and health and the closeness of

the infant with the mother and her partner at birth may be the beginning of this early relationship development.

A range of models of family-centered care has developed in relation to neonatal and children's care, many developed in the United States. A key study undertaken by Dunn in 2006 developed the family-centered care model within an American setting and described key steps in a parent's experiences. These are pre-admission, golden hours, acute, growing stronger, breathing/feeding/growing, transition to home, and post discharge. Much of the research on family-centered care and rooming-in on the obstetrical unit has focused on NICU patients and their families. Studies on this population have identified a range of benefits, including decreased infant behavioral stress cues, shorter lengths of stay, fewer readmissions, and enhanced breastfeeding (Staniszewska et al., 2012). The practice of kangaroo care, or frequent skin-to-skin contact especially when breastfeeding, in a rooming-in setting enhances bonding and attachment, decreases maternal anxiety and postpartum depression symptoms, contributes to the establishment and longer duration of breastfeeding, and has good effects on infant development. Kangaroo care has been found to promote frequent breastfeeding, and improved thermoregulation of the newborn, and may have been a factor in decreasing the time required for phototherapy treatment of neonatal jaundice (Samra et al., 2012).

Other research has focused on parental self-confidence in regard to both mothers and fathers in caring for their newborns. The main summation is that a mother needs guidance, not direction, in the care of her newborn (Katz, 2012). The mother effectively learns to trust her instincts on infant care, including keeping the baby warm and adequately fed for growth and hydration. Effective feeding promotes the clearance of bilirubin from the infant's body through urination and the passage of meconium.

Family-centered care, specifically family-centered maternity care (FCMC) has become somewhat of a catch phrase. It draws in clientele at best, yet, in reality facilities differ greatly in their understanding and implementation of FCMC. Considering all the challenges that families face in today's society, they need the support of the health care team in the first critical hours and days after birth. Education through the provision of information in a supportive setting is conducive to enabling parents to make decisions that impact their families in a positive way for generations to come (Zwelling & Phillips, 2001). The rapport that the mother develops with the health care team, coupled with the confidence she gains in her ability to perform infant care skills help her to begin the practices that will set the stage for how she continues to care for her baby at home.

Temperature Control in the Newborn

The research on thermoregulation of the newborn in relation to type of care setting (i.e., rooming-in vs. traditional nursery care) is scant. The normal core body temperature of a newborn is usually defined as ranging between 36.5 and 37.5 degrees C (97.7 to 99.5 degrees F). Mild hypothermia is classified as a body temperature range from 36 to 36.5 degrees C (96.8 to 97.7 degrees F), and may be treated by skin-to-skin contact with the mother. Moderate hypothermia is a body temperature from 32 to 36 degrees C (89.6 to 96.8 degrees F), indicating danger and a need for warming the baby, perhaps in a radiant warmer, immediately (Lunze & Hamer, 2012). Both an increased or decreased core temperature increases the metabolic rate of newborns. Though both are hard on the newborn, hypothermia seems to carry the higher risk for complications (Lunze & Hamer, 2012). Initially the hypothermic baby is noted to express irritability. This prompts the mother to pick up, hold, and wrap the infant, all ways of warming him/her. In the absence of fever or hypothermia a baby matches his/her temperature to the

ambient temperature of the surrounding air. The most common cause of hyperthermia of the newborn is dehydration. While radiant warmers have their place in the care and resuscitation of the compromised newborn, a healthy and vigorous newborn is encouraged to have skin-to-skin contact with the parents as soon as spontaneous, adequate respiration is confirmed. It is estimated that prevention of hypothermia can prevent up to 40% of neonatal deaths worldwide (Lunze & Hamer, 2012).

For the measurement of newborn temperature the axilla is the site of choice. Relative accuracy and the absence of the risks associated with complications of rectal temperature measurement makes the axillary reading preferable (Lunze & Hamer, 2012).

A Phillipine study by Sobel, Silvestre, Mantaring, Oliveros, and Nyunt-U (2011) was done in response to a deadly nosocomial outbreak, which drew attention to neonatal sepsis. Trained physicians observed 481 consecutive deliveries in 51 hospitals. Outcomes were compared based on how infants were allowed to warm and transition immediately after birth. It was found that several actual practices that make up newborn care (e.g., clamping of umbilical cord, unnecessary suctioning, early bathing, and transfer to the nursery for assessment) also interfere with thermoregulation. Sobel et al. (2011) concluded that essential interventions in the immediate period after birth should be appropriately timed and sequenced to facilitate early thermoregulation and appropriate initiation of breastfeeding and that unnecessary procedures (such as separation of neonates from their mothers) should be discontinued.

A study in St. Petersburg, Russia was conducted with the aim to evaluate how different delivery ward routines influence temperature in newborn infants (Bystrova et al., 2003). Two cohorts of newborns, totaling 176, were included in a random study. One group was placed in a crib in the nursery immediately after birth for two hours. The other group was immediately

placed in the mother's arms. The study showed that, while temperature measurement on an infant on the axilla, thigh, and back did not differ significantly between groups, the temperature measurement on the foot showed a significant fall in the nursery group, especially among those babies who were swaddled. Conversely, the temperature of the foot rose in the mothers' arms group, most especially when babies were placed skin-to-skin with their moms. The study findings led the researchers to believe that the placing of infants in their mothers' arms reduces stress, thereby promoting more efficient circulatory function which naturally aids in thermoregulation (Bystrova et al., 2003).

Rodgers (2012) described a hospital that transitioned from traditional postpartum and newborn care to mother-infant couplet care. Several positive outcomes were noted, including improved thermoregulation of the newborn and improved breast milk feeding rates.

Because practices and more specifically timing of practices used in the newborn admission process vary greatly, there is a call for more data collection to compare outcomes of methods of patient care. Research suggests maternal skin-to-skin contact with the infant may be the best method for keeping him/her at a thermoneutral state (Booker, 2014). There is indeed a fine line where the need for intervention and the importance of mother/baby togetherness meet. More data are needed on patient outcomes.

Weight and the Newborn

Another indicator of newborn transition from intrauterine to extrauterine life is the amount of weight the infant retains within the first several days and weeks of life. There are many factors that come into play in the determination of what an infant will lose in just the first 24 hours. Factors associated with express neonatal weight loss include the use of labor

medications (intravenous fluids, oxytocin, magnesium sulfate), parity, birth weight, birth type, feeding type, and delayed time to lactogenesis (Lamp & Macke, 2010).

Opinion differs on what constitutes normal newborn weight loss and gains in the newborn, and also when intervention such as formula supplementation should be considered (Tawia & McGuire, 2014). One study (Grossman et al., 2012) began by looking at the lack of data on newborn weight loss in the first week of life, and the researchers built their study around the collection of such data. This prospective cohort study was conducted at a U.S. baby friendly hospital, and data were collected on 121 infants, including measurement of daily weights for the first week after birth and recording of all feedings. No infant lost more than 10%, the value that most practitioners have come to see as the cutoff for newborns during the hospital stay (Grossman et al., 2012). Maximum percent weight loss was significantly associated with feeding type: exclusively and mainly breastfed infants lost 5.5%, mainly formula-fed infants lost 2.7%, and exclusively formula fed infants lost 1.2 %. Interestingly, type of delivery and fluids received by the mother during labor were not associated with weight loss. Grossman et al. (2012) concluded that clinical interventions at a baby friendly hospital that support and optimize breastfeeding (such as rooming-in and skin-to-skin contact with the mother) seem to only be associated with moderate weight loss in exclusively and mainly breastfed neonates. Having identified an average healthy amount of infant weight loss (less than 10%) and the factors contributing to it allows the development and implementation of interventions and activities to monitor or prevent significant weight loss.

In Rome, Italy, Zuppa et al. (2009) compared weight loss and jaundice in healthy term newborns between two feeding models: partial and full rooming-in. A total of 903 healthy term neonates were evaluated, all born at 37 or more weeks gestation and weighing 2800 or more

grams. The maximum weight loss (percentage of birth weight) was not different in the two models, nor was there any statistical difference in the mean of total serum bilirubin or prevalence of hyperbilirubinemia. Zuppa et al. (2009) concluded that although the full rooming-in model was associated with higher prevalence of exclusive breastfeeding at discharge, it was not associated with higher weight loss nor with increased severe hyperbilirubinemia prevalence in healthy term newborns in comparison to the partial rooming-in model.

Transcutaneous Bilirubin in the Newborn

The last indicator of newborn transition around which the present study developed a research question is transcutaneous bilirubin (TCB) measurement. Jaundice is the term for excessive circulating bilirubin, and it is the result of the breakdown of hemoglobin as red blood cells complete their life cycle (Cohen, 2006). This causes the yellow discoloration of the skin and sclera. Timely identification and treatment of jaundice, or hyperbilirubinemia, is essential to prevent complications such as kernicterus, which is a pathological condition characterized by bilirubin staining of the brainstem (Maisels & Watchko, 2003). Three main methods exist for assessing and identifying jaundice: clinical observation through assessment, TCB measurement, and capillary total serum bilirubin (Turnbull & Petty, 2012). Typically visually observed indications of jaundice are followed by a TCB measurement. If the value is over a certain amount based on the age in hours, a capillary serum bilirubin is drawn for comparison. Because it is a standard of care in most if not all hospital obstetrical units to check at minimum a TCB value just prior to discharge, the present study's focus was on the use of the TCB equipment. A measurement is taken noninvasively by touching the tip of the sensor to the neonate's forehead mid-brow, just above the nasal bridge, or mid-sternum.

Outside of pathological causes (ABO and/or Rh incompatibility, primarily), early onset jaundice is rare (Turnbull & Petty, 2012). However, the National Institute for Health and Clinical Excellence (NICE) estimated in 2010 that 60% of term neonates became jaundiced in the first seven days of life (as cited in Turnbull & Petty, 2012). Hyperbilirubinemia was identified as the predominant diagnosis in a three year review study of newborn readmissions (Allen, Strohecker, & Maurer, 2012).

The studies done on bilirubin levels in the newborn have traditionally been related to feeding method, weight loss, and models of newborn care. One study on TCB readings according to feeding method was performed in Japan by Itoh, Kondo, Kusaka, Isobe, and Onishi (2001). A sample of 177 breast-fed and 494 formula-fed healthy Japanese term infants were studied. The researchers felt that studying Japanese neonates would elucidate the relationship between feeding method and jaundice because these infants have a higher peak bilirubin and also a later peak than Caucasian infants. The Japanese infants have more severe and prolonged jaundice than Caucasian babies. Results showed no difference between TCB readings in formula-fed and breast-fed infants until hour 30, after which time the rate of increase in TCB was lower in formula-fed infants.

An Egyptian prospective observational study (Samra et al., 2012) investigated the effect of "kangaroo mother care", a practice of keeping the infant skin-to-skin on the mother's chest, on the duration of phototherapy for infants readmitted for jaundice. Fifty newborns ranging in gestational age from 35 to 40 weeks were evaluated. The study found that those infants who received intermittent kangaroo care recovered earlier from jaundice and required shorter courses of phototherapy, thereby decreasing length of hospital stay, than those infants who did not receive intermittent kangaroo care.

A study by Yang et al. (2013) looked at weight loss of healthy term newborn infants at 24, 48, and 72 hours after birth, using the data to predict significant hyperbilirubinemia at 72 hours. Out of 343 healthy term newborns with a birth weight of more than 2500 grams, 115 presented with significant jaundice at 72 hours. The percentage of birth weight loss on the first three days were all higher than those in the non-significant hyperbilirubinemia group. Breastfeeding, however, was not statistically correlated. Additionally, optimum birth weight loss percentages were calculated for the first three days of life.

As discussed in the previous section, in addition to weight loss, Zuppa et al. (2009) assessed jaundice in healthy term newborns in both partial and full rooming-in feeding models. A total of 903 healthy term neonates were evaluated, all born at 37 or more weeks gestation and weighing 2800 or more grams. There was no statistical difference in the mean of total serum bilirubin or prevalence of hyperbilirubinemia between the two models of care.

While there are many biophysical and biometric indicators of neonatal well-being that are consistently assessed during the postpartum hospital period, the previously discussed three measures (i.e., body temperature, percent weight change, and transcutaneous bilirubin) are basic indicators of successful transition. The basic functions of nutrition intake, waste output, and metabolism all interact for homeostasis to occur. The present study was designed to compare this process between neonates who have been cared for in a traditional nursery with part time maternal care to those infants who have remained with their mothers during the whole postpartum period (i.e., rooming-in care).

CHAPTER 3: METHODS

This chapter introduces the methods that were used to conduct the present study. The chapter discusses the research design and describes the setting, population, and sample. The procedure for data collection will be discussed, as will the instruments, specifically the electronic medical record and the spread sheet for the recording of the data obtained. Threats to validity and the process for final data analysis will be laid out. Lastly, the process for human subject protection will be described.

Research Design

This study used a quantitative, descriptive, comparative design of retrospective data that compared two groups of term neonates admitted to a north Georgia maternity center between August 2010 and February 2011. One group received traditional nursery care and the second group received rooming-in care. Differences in percent weight change, body temperature, and transcutaneous bilirubin (TCB) on the day of discharge were evaluated between groups.

Setting

The setting for this study was the obstetrical department of a small rural north Georgia hospital. At the beginning of November 2010, the hospital underwent a transition in care method. Whereas infants were previously cared for in a standard and traditional nursery setting with visits to their mothers at frequent intervals, the transition was to a model of care (rooming-in) that incorporated care of both mother and baby in a room designed and utilized as the setting for labor, birth, recovery, postpartum, and 24-hour maternal care of the infant.

Population and Sample

The population studied was neonates delivered in the small north Georgia hospital's obstetrical department. Based on a power analysis, a total sample size of 102 electronic neonate records was determined. Two groups were formed by non-random selection of neonate records based on when model of care was changed at the hospital. Group 1 (traditional care) consisted of records of 51 term neonates discharged from August 2010 through October 2010, and Group 2 (rooming-in) consisted of records of 51 term neonates discharged from November 2010 through February 2011. Neonate records were screened for inclusion and exclusion criteria before non-randomly assigned to the applicable study group. Inclusion criteria were as follows: a) mother's first live birth, b) uncomplicated vaginal delivery, c) gestation of 37 – 40 weeks, and d) neonate required no NICU services. With regard to exclusion criteria, maternal history was screened for hypertension and diabetes, including that which was pregnancy-induced or related, prenatal smoking, alcohol use, and drug use. Another exclusion criterion was non-spontaneous birth (i.e., that which was assisted by Cesarean section). Reasoning behind the exclusion criteria involved the potential for their impact on neonatal weight and general health.

Procedure for Data Collection

The neonate's birth weight was used to calculate the percentage of weight change from birth to day of discharge, and compared between the two groups. The researcher reviewed records in the maternal-infant department of the small rural hospital. Birth weight and weight on day of discharge was listed for all neonates in each study group. Percent weight change was calculated as follows: 1st) the neonate's discharge weight was subtracted from the birth weight; 2nd) this result (i.e., the difference) was multiplied by 100; and 3rd) this figure was divided by the birth weight. Axillary temperature and TCB readings on day of discharge were recorded for

each neonate from both study groups for comparison. No identifiable data were abstracted from the record. This researcher alone had access to the information, and all files were kept under lock and key and will continue to be so kept for three years after the study was completed. At the end of the three years the data will be shredded and deleted from the researcher's personal computer hard drive, which is password protected and accessed only by the researcher.

Instruments

The hospital intranet system of data collection and charting by electronic medical record (EMR) was accessed and records chosen by criteria mentioned in the section on population and sample. A spread sheet was used for data collection. The spread sheet was duplicated so that there was one for each group (i.e., traditional nursery neonates and rooming-in neonates). The data were listed in a table format, with neonates numbered 1-51 vertically and gender, birth weight, discharge weight, TCB value on day of discharge and axillary temperature on day of discharge. The data were entered into a computer system for analysis.

Threats to Validity

Although every effort was made to screen medical records for exclusion criteria, the researcher cannot account for any inadvertent erroneous data in the medical record. There was an attempt made to collect a large enough representative sample for each cohort. However, generalizability to other obstetrical units of other hospitals because of size, population, and geographic location is not known.

Data Analysis

Data were analyzed for comparison between the two groups for percent weight change, as well as temperature and TCB reading on day of discharge. Descriptive statistics, including percentages, frequencies, means, and standard deviations, were used to describe the sample. For

inferential statistics, a one-way analysis of variance (ANOVA) was used to examine the differences between the two groups on each of the three outcome variables. Analyses were conducted using SPSS for Windows Release 22.0. Missing data were not problematic as there was pre-analysis data screening conducted, and records were excluded if one or more values were missing on any of the outcome variables. This screening process occurred until the predetermined number of records was obtained (i.e., 102 total, 51 in each group).

Human Subject Protection

Approval from the Human Subjects Institutional Review Board at Hamilton Medical Center was obtained (Appendix B), followed by approval from the Institutional Review Board of Kennesaw State University (Appendix C). An exemption was obtained as the study used only retrospective data, and therefore there was no threat to human subjects. This information is protected by password entry to hospital intranet, with another password entry to clinical records/information on patients. The researcher was bound by policy on safe and confidential usage of EMR including logging out of patient information when leaving the area for any length of time. The collected information, none of which is personally identifying, will be kept under lock and key accessible to only the researcher.

CHAPTER 4: RESULTS

This chapter presents a summary of the data analysis and discusses the data analysis plan, the sample characteristics, and the results. The data analysis answers the following research question: Do term neonates cared for by their mothers in a rooming-in setting have similar health outcomes at discharge, measured by percent weight change, body temperature, and transcutaneous bilirubin levels, compared to term neonates cared for in a traditional nursery care setting?

Data Analysis

Descriptive and inferential statistics were analyzed using SPSS for Windows Release 22.0. A pre-analysis data screening was conducted and revealed there was no missing data as expected, given charts were excluded if one or more values were missing on any of the outcome variables. Descriptive statistics (frequencies, percentages, means, and standard deviations) were performed to describe the sample on several variables, including gender, birth weight, discharge weight, discharge temperature, and discharge bilirubin level. In addition, a one-way analysis of variance (ANOVA) was conducted to examine whether there were differences in outcomes (percent weight change, discharge temperature, and discharge bilirubin level) of term neonates cared for by their mothers in a rooming-in setting compared to a traditional nursery setting. The level of significance was set at .05.

Sample Characteristics

A total of 102 charts were selected for the final sample consisting of 51 term neonates in the traditional nursery group and 51 term neonates in the rooming-in group. A little over half of the neonates were male in the total sample (n = 54, 52.9%) as well as in both the traditional nursery group (n = 28, 54.9%) and the rooming-in group (n = 26, 51.0%).

Weight. The mean birth weight (in grams) was 3248.44 (*SD* = 352.70) for the total sample, 3225.02 (*SD* = 303.38) for the traditional nursery group, and 3271.87 (*SD* = 397.65) for the rooming-in group. The mean discharge weight (in grams) was 3112.17 (*SD* = 355.19) for the total sample, 3079.04 (*SD* = 302.70) for the traditional nursery group, and 3145.29 (*SD* = 401.23) for the rooming-in group. For all groups, discharge weight was subtracted from birth weight, resulting in a negative or positive number (or net zero). Data revealed on average, term neonates lost weight from birth to discharge in all groups, with a mean weight loss of 136.27 grams for the total sample, a mean weight loss of 145.98 grams for the traditional nursery group, and a mean weight loss of 126.58 grams for the rooming-in group.

Discharge temperature. Discharge axillary temperature was measured in degrees Fahrenheit. The mean temperature was 98.23 for the total sample (*SD* = 0.34) as well as the traditional nursery group (*SD* = 0.31) and the rooming-in group (*SD* = 0.36).

Transcutaneous bilirubin. The mean discharge transcutaneous bilirubin (in mg/dl) was similar for all three groups. Discharge transcutaneous bilirubin measured at 8.35 (*SD* = 2.60) for the total sample, 8.36 (*SD* = 2.46) for the traditional nursery group, and 8.35 (*SD* = 2.77) for the rooming-in group.

Table 1

Characteristics of the Final Sample (N = 102).

Variable	*n*	*%*
Gender		
Total Sample		
Male	54	52.9
Female	48	47.1
Traditional Nursery		
Male	28	54.9
Female	23	45.1
Rooming-In		
Male	26	51.0
Female	25	49.0
	M	*SD*
Birth Weight (grams)		
Total Sample	3248.44	352.70
Traditional Nursery	3225.02	303.38
Rooming-In	3271.87	397.65
Discharge Weight (grams)		
Total Sample	3112.17	355.19
Traditional Nursery	3079.04	302.70
Rooming-In	3145.29	401.23
Discharge Temperature (°F)		
Total Sample	98.23	0.34
Traditional Nursery	98.23	0.31
Rooming-In	98.23	0.36
Discharge Bilirubin (mg/dl)		
Total Sample	8.35	2.60
Traditional Nursery	8.36	2.46
Rooming-In	8.35	2.77

Research Question

A one-way ANOVA was conducted to explore the impact of rooming-in on term neonates' percent change in weight, discharge temperature, and discharge transcutaneous bilirubin levels. Term neonates were divided into two groups: traditional nursery and rooming-in. No statistically significant difference was found for neonates' percent change in weight between the traditional nursery group and the rooming-in group, $F(1, 100) = 1.70$, $p = .195$. In addition, no statistically significant difference was found for neonates' discharge temperature between the traditional nursery group and the rooming-in group, $F(1, 100) = 0.003$, $p = .953$. Furthermore, no statistically significant difference was found for neonates' discharge transcutaneous bilirubin level between the traditional nursery group and the rooming-in group, $F(1, 100) = 0.000$, $p = .985$.

Table 2

One-Way ANOVA Results for Term Neonates' Percent Change in Weight, Discharge Temperature, and Discharge Bilirubin Level (N = 102).

Source	*df*	*SS*	*MS*	*F*	*p*
Percent Weight Change					
Between Groups	1	10.037	10.037	1.700	.195
Within Groups	100	590.231	5.902		
Total	101	600.268			
Discharge Temperature					
Between Groups	1	.000	.000	.003	.953
Within Groups	100	11.404	.114		
Total	101	11.403			
Discharge Bilirubin Level					
Between Groups	1	.002	.002	.000	.985
Within Groups	100	684.332	6.843		
Total	101	684.335			

CHAPTER 5: DISCUSSION

This chapter discusses the interpretation of data findings from the present study and relates these findings to previous findings from other studies. The present study's limitations are then discussed. Lastly, the chapter discusses the relevance of the research findings in relation to nursing practice, nursing education, and future nursing research.

The data findings from this study answered the research question in the affirmative. Term neonates cared for by their mothers in a rooming-in setting have similar health outcomes at discharge compared to term neonates cared for in a traditional nursery setting. As previously discussed, no statistically significant difference was found for neonates' percent weight change, body temperature, or transcutaneous bilirubin level at discharge between the traditional nursery group and the rooming-in group.

These findings support the literature on the benefits of keeping mothers and their newborns together throughout the hospital stay. The research on comparisons of neonates from the two care settings is very scant, and much of this research has been carried out in other countries. For instance, a Philippine study by Sobel et al. (2011) found that neonates warming in a nursery setting were more likely to have that warming period interrupted frequently by admission practices that actually are able to be delayed for the stable term neonate. Examples are earlier bathing and suctioning of the airways. A study in St. Petersburg, Russia (Bystrova et al., 2003) similarly supported these findings in that it showed no significant difference in thermoregulation of neonates, whether placed in the nursery or in their mothers' arms for the first two hours after birth. Bystrova et al. (2003) also found that neonates held skin to skin after birth as well as during feedings reached adequate body temperature and maintained body temperature better than those neonates warmed by being swaddled in blankets. Rodgers (2012) described a

hospital that transformed from traditional postpartum and newborn care to maternal-infant couplet care in which one of the outcomes noted was improved thermoregulation of the newborn.

An Italian study conducted by Zuppa et al. (2009) on both weight loss and jaundice in healthy term newborns from either a partial or full rooming-in setting was supported by similar findings in the present study. The maximum weight loss (percentage of birth weight) was not different in the two models, nor was there any statistical difference in the mean of total serum bilirubin (Zuppa et al., 2009).

Samra et al. (2012) found earlier recovery from jaundice, decreased length of hospital stay, and shorter duration of phototherapy for readmitted neonates who received intermittent kangaroo care (skin to skin contact) by their parents versus those readmitted neonates who did not receive intermittent kangaroo care by their parents. The difference in Samra et al.'s study and the present study is that newborns were readmitted, whereas the present study did not track neonates past the initial stay and day of discharge.

Limitations

One limitation in the present study was there are natural variances that occur during the course of healthy term pregnancy, labor, delivery, and the immediate postpartum period. Other factors unable to be controlled for in this study were length of labor, variations in receipt of analgesia and/or anesthesia, and intravenous fluid intake. Findings of a study by Noel-Weiss et al. (2011) indicated that maternal intravenous fluids during labor and delivery are related to neonatal output and weight loss. The same study discussed that the rate of diuresis varies maternally, as well as in the fetus and neonate. Obviously these factors can impact newborn weight and clearance of bilirubin through the kidneys, liver, and intestines, which potentially threaten internal validity of this study.

Another potential threat to internal validity in this study is that several demographic characteristics were not collected on the mothers or term neonates. Therefore, no determination could be made on similarities or differences between the two groups (rooming-in vs. traditional nursery) in those demographics.

Another limitation is that the present study was a retrospective analysis of cases from only one small hospital obstetrical unit in a small rural community. Additionally, as a descriptive study, findings are descriptive and so inferences cannot be made. Therefore, generalization to other regions or areas is not possible.

Lastly, although it is assumed that all weights were on the same scale and measurements were done on accurate equipment using accurate procedures, reality is that all equipment has some measurement error and there is typically variance among health care professionals in taking measurements. This could affect reliability of results.

Implications

The findings of this study were significant in supporting the practice of rooming-in. There are several important implications in the areas of nursing practice, nursing education, and future research.

Nursing practice. Researchers have examined the impact of the two models of neonatal care - traditional nursery and rooming-in - and how nurses may influence the mothers' attitudes toward each model (Svensson et al., 2005). Svensson et al. (2005) noted that mothers tended to leave their babies in the nursery at night because they perceived that the nurses thought this best. Another study found that although nurses had a knowledge of the importance and challenge of delivering family-centered care in a maternal setting, they still perceived a need for

organizational support as well as ongoing education to help them provide family-centered care (Trajkovski et al., 2012).

One study that evaluated patient outcomes since implementation of rooming-in looked specifically at its impact on breastfeeding success and duration, with rooming-in infants having slightly more feedings per day than their non-rooming-in counterparts (Jaafar et al., 2012). It may be surmised that nursing support of rooming-in may also assist in breastfeeding success for their patients.

Nursing education. Young's (2012) findings indicated that education on the provision of baby-friendly maternity care made a significant impact on the knowledge and attitudes of the majority of the participants (i.e., nurses, pediatricians, and obstetricians). Findings from the present study, as well as previous studies, have the potential for use in nursing education. A knowledgeable nurse is confident in sharing information with peers as well as patients. A positive attitude toward organizational practices assists the nurse in promoting the practices as a standard of care. Combining the best medical care with the most naturally beneficial family-centered practices will be an important component of nursing education that spans all stages of the life cycle. Making patients and their family part of the health care team is now a standard of care. In the obstetrical department, keeping the mother and her baby together throughout the hospital stay is both a beginning point and an example to encourage innovative ideas and practices to continue the support of the family unit throughout the life cycle.

Future research. Because the present study compared the outcomes based on neonatal biometric measurements, there is implication for further and more extensive research between the two models of neonatal care. If the study could be replicated in other areas of the country,

and on diverse populations, any replication of findings would be supportive both of this study as well as the practice of rooming-in.

Ideas for other potential studies include those that focus on the anecdotal experiences and perceptions of families as well as nurses, pediatricians, and other members of the health care team. As reimbursement is increasingly tied to outcomes and patient satisfaction scores, it would definitely benefit the healthcare industry to gauge the public attitudes toward rooming-in. Successful marketing strategies could then be developed to sell the practice based on the data findings that show rooming-in to be beneficial for the neonate. It would then follow that studies measuring maternal outcomes through the analysis of vital signs and comfort level would have the potential to highlight the benefits to maternity patients. The presence or absence of postpartum depression could be assessed through one of the questionnaire tools in common use today, with the potential for increased understanding of the condition and how best to help those suffering from it. Lastly, the design of a tool to estimate parental confidence and the potential to parent successfully could assist with the social services referral process as well as other community linkages that support the family.

Conclusion

The purpose of the present study was to examine the differences in outcomes based on biometric measurements between two groups of term neonates cared for in two different models of care - traditional nursery versus rooming-in. Findings indicated that there was no significant difference between these two groups in any of the outcomes, including percent weight change, body temperature, and transcutaneous bilirubin level on day of discharge. This suggests that the practice of rooming-in is not only beneficial to the family as previous studies have shown, but also promotes the same level of physical well-being for the neonate. These study findings

strengthen the case for hospitals to either continue the practice of rooming-in or to transition to rooming-in if currently practicing within the traditional nursery setting. Further studies are needed to assess maternal outcomes and attitudes as well as to determine the impact of rooming-in versus nursery care on patient satisfaction scores.

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Appendix A

Permission to Use Theoretical/

Conceptual Framework Model

From: Jennifer Pass [jennylynnpass@aol.com]
Sent: January-04-15 8:58 PM
To: sharyn.gibbins@sunnybrook.ca.
Subject: request permission to use your care model illustration in thesis body

Dear Ms. Gibbins:

I am currently a student at Kennesaw State University in Kennesaw, Georgia, USA. I am working on my thesis as completion of the requirements for the Masters of Science in Nursing, Health Care Policy and Administration. I am using The Universe of Developmental Care Model, as adapted by Phillips Healthcare to create the Maternal and Child Integrative Developmental Care Model.

I would like to ask your permission to use any illustrations and descriptive terms from your writings, with proper citations, including the diagram of the care model itself.

I will be eagerly looking forward to hearing from you, as I hope to have the final version of the thesis proposal ready by the last full week of the month of January.

Sincerely,

Jennifer Pass, RN, BSN

On Jan 5, 2015, at 2:44 PM, "Gibbins, Sharyn" <Sharyn.Gibbins@sunnybrook.ca> wrote:

I give my permission but need clarity on which version....the flower image or the original

tx,

shayrn

Sharyn Gibbins, PhD

From: jennylynnpass@aol.com [jennylynnpass@aol.com]
Sent: January-05-15 6:38 PM
To: Gibbins, Sharyn
Subject: Re: request permission to use your care model illustration in thesis body

Oh, I didn't think about that. Do you have a preference? Otherwise, the flower is easier for me.

Thank you for your quick reply.

Jennifer

Hi

The flower isnt mine, and in fact, I dont like it. The planets reflect the care practices required for the care of the infant, with family and staff as support structures.

The flower is misleading.....in my opinion

sharyn

Sharyn Gibbins, PhD

Appendix B

Approval from Hamilton Medical Center

Human Subjects Institutional Review Board

Hamiltonhealth
Hamilton Medical Center

January 30, 2015

Jennifer Pass, BSN, RN
Principal Investigator-Kennesaw State University
Weight, Temperature, and Transcutaneous Bilirubin of the Term Neonate at Discharge: A Comparative Study Between a Nursery and Rooming In Model of Care

Dear Ms. Pass:

This letter is to inform you that the Hamilton Medical Center IRB has reviewed and approved the study entitled 'Weight, Temperature, and Transcutaneous Bilirubin of the Term Neonate at Discharge: A Comparative Study Between a Nursery and Rooming- In Model of Care'

Please share your results with us once the study is complete. An annual update and review are necessary should you need to continue the study.

Sincerely,

Laura Conger, MD
IRB, Co- Chair
Hamilton Medical Center

P.O. Box 1168 • Dalton, GA 30722-1168
hamilton health.com

Appendix C

Approval from Kennesaw State University

Institutional Review Board

Dr. Long,

Please see below the letter that was sent out by Dr. Ziegler on 2/23/15 to both of you via email approving her exemption request.

2/23/2015

Jennifer Pass

RE: Your application dated 2/19/2015, Study #15-305: Weight, Temperature, and Transcutaneous Bilirubin of the Term Neonate at Discharge: A Comparative Study Between a Traditional Nursery and A Rooming-In Model of Care

Dear Ms. Pass:

Your application for the new study listed above has been administratively reviewed. This study qualifies as exempt from continuing review under DHHS (OHRP) Title 45 CFR Part 46.101(b)(4) - collection or study of existing data. The consent procedures described in your application are in effect. You are free to conduct your study.

Please note that all proposed revisions to an exempt study require IRB review prior to implementation to ensure that the study continues to fall within an exempted category of research. A copy of revised documents with a description of planned changes should be submitted to irb@kennesaw.edu for review and approval by the IRB.

Thank you for keeping the board informed of your activities. Contact the IRB at irb@kennesaw.edu or at (470) 578-2268 if you have any questions or require further information.

Sincerely,

Christine Ziegler, Ph.D.
KSU Institutional Review Board Chair and Director