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Breastfeeding-A Protective Intervention for Child Maltreatment of NICU Graduates

Janeen E. Cross

University of Pennsylvania, janeencross@gmail.com

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Breastfeeding-A Protective Intervention for Child Maltreatment of NICU Graduates

Abstract

National statistics show that infants have the highest child maltreatment victimization and fatality rate compared to all other age groups. NICU infants are represented in both the unique victim and fatality groups. Mothers are identified as the highest reported child maltreatment perpetrator group based on national statistics. NICU infants are at significant risk for maltreatment because the NICU environment potentially disrupts mother-infant attachment and the care required for the NICU infant is complex. In addition, mothers with infants in the NICU are at higher risk for trauma related stress, post-traumatic stress, and post-partum depression which can further impair their parenting abilities. This dissertation examines breastfeeding and the provision of human milk as a protective factor for child maltreatment of NICU graduates. Attachment theory is the theoretical framework used to examine child maltreatment and the particular risk to NICU graduates. This dissertation proposes that breastfeeding and the provision of human milk can strengthen attachment in the mother-infant dyad and therefore keep infants safer and in close proximity of the mother. Academic social work, medical, and nursing literature were reviewed to support or refute the hypothesis that breastfeeding and the provision of human milk can serve as a protective factor for NICU graduates. The literature offers support to this hypothesis that breastfeeding and the provision of human milk can potentially serve as a protective factor against child maltreatment. The dissertation informs social work practice in a NICU setting, contributes to the prevention of child maltreatment of NICU graduates, and supports professional collaborations between social work and nursing.

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First Advisor

Marcia Martin, PhD

Second Advisor

Cindy Christian, MD

Third Advisor

Diane Spatz, PhD

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Breastfeeding-A Protective Intervention for Child Maltreatment of NICU Graduates

JaNeen Cross

LITERATURE REVIEW & ACCOMPANYING PAPER

in

Social Work

Presented to the Faculties of the University of Pennsylvania

in

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Marcia Martin, PhD
Dissertation Chair

John L. Jackson, Jr., PhD
Dean, School of Social Policy and Practice

Dissertation Committee

Cindy W. Christian, MD
Diane L. Spatz, PhD

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Dedication & Acknowledgments

This body of work is dedicated in loving memory to our lost NICU children and their grieving families.

I would like to thank my dissertation committee members (Dr. Marcia Martin, Dr. Cindy Christian, and Dr. Diane Spatz) for their tireless dedication and support. I would like to offer special thanks to Lori Carpenter and Dr. Sunny Hallowell for offering a tremendous amount of insight and passion. Most importantly, this work would not be possible without the love and support from my mother (Edith), daughter (Diane), and siblings (Keith, Tony, Karen, & Quincy). A special thanks to my dear friend Kenny for ongoing encouragement and always reminding me to tirelessly pursue my full potential.

Project Abstract

National statistics show that infants have the highest child maltreatment victimization and fatality rate compared to all other age groups. NICU infants are represented in both the unique victim and fatality groups. Mothers are identified as the highest reported child maltreatment perpetrator group based on national statistics. NICU infants are at significant risk for maltreatment because the NICU environment potentially disrupts mother-infant attachment and the care required for the NICU infant is complex. In addition, mothers with infants in the NICU are at higher risk for trauma related stress, post-traumatic stress, and post-partum depression which can further impair their parenting abilities. This dissertation examines breastfeeding and the provision of human milk as a protective factor for child maltreatment of NICU graduates. Attachment theory is the theoretical framework used to examine child maltreatment and the particular risk to NICU graduates. This dissertation proposes that breastfeeding and the provision of human milk can strengthen attachment in the mother-infant dyad and therefore keep infants safer and in close proximity of the mother. Academic social work, medical, and nursing literature were reviewed to support or refute the hypothesis that breastfeeding and the provision of human milk can serve as a protective factor for NICU graduates. The literature offers support to this hypothesis that breastfeeding and the provision of human milk can potentially serve as a protective factor against child maltreatment. The dissertation informs social work practice in a NICU setting, contributes to the prevention of child maltreatment of NICU graduates, and supports professional collaborations between social work and nursing.

Project Overview

This research is designed to examine the needs of NICU infants, a maltreatment group that represents one of the highest at-risk populations. There currently are no identified articles that specifically address the relationship between attachment and child maltreatment of NICU graduates and there is a lack of information on evidenced-based parenting methods that explicitly reduce child maltreatment. This research is intended to inform child welfare providers of the child maltreatment risks of NICU graduates based on their age, status, and predisposition for harm as a result of their medical fragility. The purpose of this research is to prevent child maltreatment of NICU graduates through enhancing parental attachment bonds through the provision of human milk and breastfeeding while infants are in the NICU and following their discharge.

It is proposed that breastfeeding may be a parenting method that promotes attachment in the mother-infant system. Attachment theory is an ideal evidence-based theoretical framework for considering interventions designed to prevent child maltreatment of NICU infants and graduates as it focuses attention on the caregiver-infant dyad as the system for exploration, safety, and security. Attachment theory espouses that the close proximity of a caregiver serves as a safe base for infants particularly in times of stress, and, overtime, representational models of attachment figures provide a sense of security. The provision of human milk and breastfeeding begins at the earliest post-partum opportunity and keeps infant in close proximity to caregiver and facilitates the development of the safe base. While it may be challenging, it also initiates parental bonding at the earliest moments of life, and strengthens parental capabilities and skills in preparation for a safe discharge home. It is the ability to overcome the psychosocial challenges of providing human milk that strengthens parental coping and adaption skills for use

post discharge. In overcoming the psychosocial challenges of human milk provision, NICU mothers are developing positive parenting trajectories. For the purpose of this research the mother-infant dyad is the focus of attention and infants are defined as children under the age of one. The provision of human milk and breastfeeding in a NICU setting is defined as feeding at the breast, expressed human milk using an electric or hand pump, or expressed donor milk. The provision of human milk and breastfeeding may have the potential to counter the factors that disrupt attachment in the NICU and keep NICU graduates safe at home. A review of the literature in the area of child maltreatment, NICU parenting, and the provision of human milk and breastfeeding will be undertaken in order to consider this hypothesis.

This dissertation consists of two papers: “One article-length paper accompanied by a critical review of the literature” (Penn School of Social Policy & Practice, 2013 p.6). The first article, a formal literature review, includes these sections:

- Why child maltreatment is a concern?
 - a. Risk and effects
- Maltreatment concerns for NICU families
 - a. Attachment and child maltreatment
- The provision of human milk and breastfeeding strategies for NICU infants
- The provision of human milk and breastfeeding as a protective factor for NICU infants and graduates
- Implications for further research

The second article, a theoretical/conceptual paper, synthesizes the literature in child maltreatment, NICU parenting, and breastfeeding and further develops the hypothesis that

breastfeeding is a protective factor for the maltreatment of NICU graduates. The second article links these areas:

- Why are NICU infants a particular concern and what are the effects of the medical environment on parenting?
 - a. Psychosocial challenges
 - b. Attachment
- The provision of human milk and breastfeeding as a protective factor for NICU infants
- The psychosocial challenges of providing human milk
- The positive parenting trajectories that can occur through overcoming the challenges to human milk provision
- NICU breastfeeding implications and social work

The hypothesis that the provision of human milk and breastfeeding is a protective factor against the child maltreatment of NICU infants through the enhancement of attachment bonds finds support in the literature. Parents who successfully breastfeed or provide human milk for their children in the NICU may be less likely to abuse their children following discharge.

Breastfeeding and the provision of human milk is overlooked as an attachment-based intervention to protect infants against child maltreatment, and as an intervention that may be most beneficial for NICU graduates who have special needs and represent the most vulnerable abuse and fatality group. The provision of human milk and breastfeeding target child maltreatment at the earliest point of parental bonding with our most fragile population. It places traditional and nontraditional child welfare providers in a position to support the mother-infant dyad. It is recommended that further research is needed to explore the provision of human milk and breastfeeding as a protective factor against the child maltreatment of NICU graduates.

**When NICU Children are not Safe at Home: A Review of Child Maltreatment Literature
and its Safety Implications for NICU Graduates**

Abstract: Based on child maltreatment statistics, NICU graduates are at increased risk for child maltreatment. Infants in the NICU are at higher risk for maltreatment because of their age group, medical status, and potential medical needs. Attachment theory is recommended as a theoretical framework for child maltreatment prevention as the NICU course often can disrupt attachments and reduce or delay bonding between parents and their children. It is proposed that maternal breastfeeding and the provision of human milk for NICU infants and graduates may provide a protective factor against child maltreatment and promote infant-caregiver attachment. Further research is needed to examine child maltreatment risk and breastfeeding as a protective factor for NICU graduates.

Why Child Maltreatment is a Concern

Child maltreatment continues to be a public health concern (Department of Health and Human Services, 2012; Institute of Medicine, 2013) with overall estimated annual costs to society totaling \$80 billion (Gelles & Perlman, 2012). The financial costs, however, pale in comparison to the costs in lives disrupted and lost; according to the National Child Abuse and Neglect Data System (NCANDS), in 2013, there were approximately 679,000 child victims of abuse and neglect, a rate of 9.1 victims per 1,000 children in the population (Child Maltreatment, 2013). The risk to infants birth to 1 year is even higher, with a child maltreatment rate of 21.9 per 1,000, the highest child maltreatment victimization rate (Department of Health and Human Services, 2012). Also, infants under the age of one die from abuse and neglect at a rate of 18.8 per 100,000 children in that population, which is three times the death rate for children one year and over. In 2012, seventy percent of total child fatalities occurred in children under the age of three (Department of Health and Human Services, 2012).

A public health concern is warranted due to the systemic and pervasive negative outcomes (i.e. physical, psychological, and social) associated with child maltreatment. While child maltreatment is pervasive in society, it should be noted that a significant percent of abuse is under-reported which limits the full scope of the problem. Factors including failure to recall, denial, misinterpretation, and embarrassment result in under-reporting (Gilbert, Widom, Browne, Fergusson, & Webb, 2009). Betrayal trauma also contributes to under-reporting of child maltreatment (Kaehler, Babcock, Deprince, & Freyd, 2012). Betrayal trauma is defined as a child's psychological denial of abuse in order to maintain perceived attachment to caregivers. When betrayal trauma occurs, the child endures future abuse and this abuse often remains

unreported. The failure to report abuse provides a challenge for researchers and practitioners who are working to understanding the full scope of child maltreatment.

There are inaccurate perceptions of child maltreatment. The media is inclined to portray the most horrific cases of child maltreatment that generally are not representative of the majority of child maltreatment cases, and this obscures the overall perception of child maltreatment (Saint-Jacques, Villeneuve, Turcotte, Drapeau & Ivers, 2012). In addition, media coverage contributes to labeling and can influence public perceptions and heighten public awareness of relatively limited types of abuse. This type of media coverage, however, can be beneficial for promoting overall awareness, clarifying concepts and promoting research funding. Based on the reporting of less predominant child maltreatment, the public is often unaware that neglect is the most prevalent form of child maltreatment. Presently, the Department of Health and Human Services (DHHS) reports that neglect comprises a majority (75%) of child maltreatment cases, followed by physical abuse (18%), and sexual abuse (9%), yet it is primarily the physical and sexual abuse cases that have received the most media attention (DHHS, 2012).

Another aspect of unpublicized child maltreatment data includes the exorbitantly high risk for infants. Infants, defined as children under one-year of age, have a unique victimization rate of 21.9 per 1,000 which represents the age group with the highest victimization rate in the nation (DHHS, 2012). In addition, infants are cited as having the highest abuse and fatality rates (Finkelhor & Jones, 2006; Friedlander, Rubin, Alpern, Mandell, Chrisitan, & Alessandrini, 2005; Friedman, Sheppard, & Friedman, 2012; Gilbert et al., 2009). Parents are overwhelmingly represented as perpetrators of neglect, with maternal neglect exceeding paternal neglect at 37% and 19% respectively (Bundy-Fazioli and Delong Hamilton, 2013). More than half (54%) of abuse and neglect perpetrators are women; in 80% of child fatality cases, the identified

perpetrators are parents (DHHS, 2012). Damashek, McDiarmid, Nelson, & Bonner (2013) identify child neglect and fatal neglect perpetrators as predominantly female and biologically related to the victim. Welch & Bonner's (2013) study sample of maternal fatal neglect perpetrators identified 59% as White, 20% as African-American, 12% as American Indian, and 3% as Hispanic women.

Risks and Effects

Studies have been conducted to determine the adverse outcomes of child maltreatment. Gilbert et al. (2009) found an association between child maltreatment and the development of eating disorders, abnormal sexual behavior, sex work, teenage pregnancy, and HIV in victims of child maltreatment. In addition, Lanius, Bluhm & Frewen (2012) linked metabolic, cardiovascular, immunological, and gastrointestinal problems to child maltreatment. Furthermore, Lanius et al., (2009) asserted that maltreated children are more likely to be violent, harm others, have increased arrests, and possess weapons, often out of their fear of incurring further harm. Lanius et al., (2009) reported that survivors of childhood abuse are at increased risk of psychiatric disorders (i.e. PTSD, anxiety, depression, substance abuse, personality disorders, sexual disorders, antisocial behaviors) and are at a doubled risk for a suicide attempt early in adulthood (Gilbert et al., 2009).

Children exposed to multiple abuses, based on a lack of parental response and protection, are believed to suffer from cumulative trauma (Grasso, Greene, & Ford, 2012). Grasso et al., (2012) assert that cumulative trauma occurs in the absence of parental response and protection and increases a child's risk of being a victim of multiple maltreatment incidents (poly-victimization). This type of child victimization experience is termed complex trauma and encompasses fear, isolation, and devaluation of the child that can extend through adulthood

(Grasso et al., 2012). The Adverse Childhood Experience Study (ACES) provides researchers with significantly more comprehensive information about the impact of cumulative trauma on mental and physical health (Felitti, Anda, Nordenberg, Williamson, Spitz, Edwards, Koss, & Marks, 1998; Grasso et al., 2012). The findings of the ACES study show that when surveyed, many adults report a childhood history that includes adverse childhood experiences and maltreatment, parental impairments and household dysfunctions (Felitti et al., 1998; Grasso et al., 2012). These earlier negative childhood experiences correlate with later physical and mental morbidity and early mortality (Felitti et al., 1998; Grasso et al., 2012). In addition, exposure to adverse childhood experiences are cumulative in their effects on the health of adults, resulting in more disease as the severity of adverse experiences increases (Felitti et al., 1998; Grasso et al., 2012).

Bundy et al., (2013) conducted a qualitative study exploring the attitudes of maternal neglect perpetrators. In Bundy et al.'s (2013) study, the themes that emerged included the maternal perpetrators' own psychosocial challenges associated with childhood trauma, mental illness, substance abuse and unmet support needs. These highlighted themes illustrate the types of risk factors experienced by maternal neglect perpetrators. Understanding the psychosocial risk factors experienced by maternal neglect perpetrators can help service providers appropriately address their needs.

Often, Service providers often misperceive and misunderstand the actions of maternal neglect perpetrators, perhaps erroneously imposing their values on service recipients (Bundy et al., 2013). The Bundy et al., (2013) study concluded that maternal neglect perpetrators were often struggling with a multitude of psychosocial constraints and their behaviors were often misunderstood or taken out of context by professional service providers. Service providers, who

do not understand the psychosocial challenges that lead to child maltreatment risks, fail to appropriately address the needs of maternal neglect perpetrators and compromise the therapeutic relationship. In this study, maternal neglect perpetrators discuss relationship voids with child welfare service providers, including a lack of respect and mutual trust (Bundy et al., 2013). Based on these misperceptions, the necessary therapeutic, supportive relationships required for effective intervention often failed to develop.

The risk factors for physical abuse of infants include a child being under the age of 18 months, prematurity, and twinship (Friedman et al., 2012). Fallon, Ma, Allan, Pillhofer, Traocme, & Jud, (2013) identify positive toxicology results at birth, fetal alcohol effects (FAE), developmental delays, attachment issues, and disabilities (i.e. physical, cognitive, development) as particular infant risk factors for abuse. The risk factors in infant-related child welfare investigations include caregivers between the ages of 20 and 30, caregivers as domestic violence victims, caregivers with minimal supports, and caregivers with mental health, substance abuse, and alcohol abuse issues (Fallon et al., 2013). Supplemental factors identified by Fallon et al., (2013) include caregivers with histories of out of home placements, cognitive impairments, and physical health concerns. The statistics related to the maltreatment of infants and the associated risk factors are especially applicable to infants in newborn intensive care environments. Based on this evidence, there is major cause for concern for newborn infants who spend time in and are discharged from the Newborn Intensive Care Unit (NICU).

Maltreatment Concerns for NICU Families

NICU graduates obviously are unable to themselves report maltreatment. NICU parents, other family members or neighbors and friends must either report maltreatment or medical providers must discover that maltreatment has occurred through medical exams, investigations,

or emergency department visits. In the face of morbid outcomes data on infants, especially on vulnerable infants, health practitioners have an enormous responsibility for preventing and reducing child maltreatment.

NICU parents experience high levels of stress during the NICU course (Tandberg, Sandtro, Vardal, & Ronnestad, 2013). The high levels of stress are related to a NICU infants' fragile appearance as well as caregivers' inability to themselves provide much care to their infants and establish significant levels of intimacy with their infants. In addition, stress related trauma has been associated with parents' perception that their infants' NICU admission as a disruption to their anticipated norm, and thus contributes to feelings of on-going, enduring uncertainty, and lack of agency in their parenting role (Lasiuk, Comeau, & Newburn-Cook, 2013). Melnyk, Feinstein, Alpert-Gellis, Fairbanks, Crean, Sinkin, Stone, Small, Tu & Gross (2005) believe that for these parents, long-term poor parenting outcomes are due to negative parent-child interaction trajectories that begin in the NICU. Stress, feelings of helplessness, absence of parenting knowledge, and negative child-interaction, contribute to misperceptions about the infant, resulting in difficult parent-child interactions (Melnyk et al., 2005).

Parents experiencing a NICU admission have an increase in psychological stress which may endure well after their infants' discharge (Jotzo & Poets, 2005). NICU parents have increased symptoms of intrusion and avoidance and higher risk of post-traumatic stress disorder (PTSD) resulting from untreated stress. Jotzo & Poets (2005) believe that the emotional impairments of NICU parents have long-term, adverse impact on parental self-confidence and parenting.

Hodgkinson, Beers, Southammakosane, & Lewin (2014) report that mothers who have infants in the NICU are at significant risk for developing post-partum depression (PPD). There is a

correlation between maternal depression and attachment, with maternal depression being associated with diminished parenting skills and later behavioral difficulties in children. The effects of PPD in mothers continue to be a concern after their infants' discharge from the NICU. Bergstrom, Wallin, Thomson, & Flacking (2012) found that some mothers in the NICU can experience PPD for up to 4 months post discharge. In their study, single mothers were at higher risk for experiencing PPD at 4 months, mothers with a history of depression had an increased risk of experiencing PPD at 1 month post discharge, and mothers who felt depressed during the pregnancy experienced PPD at 1 and 4 months post discharge.

Maternal depression is associated with 2 to 3 fold risk of committing physical abuse, psychological aggression, and medical neglect (Conron, Beardslee, Koenen, Buka & Gortmaker, 2009). Conron et al. (2009) used data from the National Survey of Child and Adolescent Well-being (NSCAW) to determine if change in maternal depression status predicted a change in maltreatment for maternal abuse perpetrators. They concluded that maternal child maltreatment perpetrators who experienced an onset of depression were at an increased risk of committing 2.3 more psychologically aggressive acts in a 12-month period than mothers who did not experience an onset of depression.

NICU children are a special group and their families have unique needs and risks. While the hospital can address the medical needs, NICU parents have particular needs for information (Brazy, Anderson, Becker, & Becker, 2001), require regular communication (Orzalesi & Aite, 2011), and display "information behavior" while in the NICU (De Rouck & Leys, 2011). De Rouck and Leys (2011) assert that parents' "information behavior" occurs when the disease course for NICU infants triggers parent information-seeking behavior; the infant's sickness-trajectory influences a parent's informational needs and the frequency of information required

(DeRouck & Leys, 2011). The literature recommends a careful and ongoing assessment of overall parent needs in the NICU (Mundy, 2010). Studies advocate for parenting support in the NICU to ensure successful health outcomes (Hurst, 2006; Nearing, Salas, Granado-Villar, Chandler, & Soliz, 2012; Nottage, 2005). Similarly, studies emphasize the need to prepare caregivers for transition from the NICU to home (Marcellus, 2004), which includes overcoming cultural barriers such as language, communication, illiteracy, and low socioeconomic status to prepare NICU families for successful outcomes post-discharge (Miquel-Verges, Donohue, & Boss, 2011).

There is a need for increased awareness of maltreatment risks associated with disabled children (Hibbard & Desch, 2007). Although NICU children are not defined as “disabled children,” their needs are similar to these children, as they have special medical needs and may have subsequent impairments. Direct services which are tailored to the needs of NICU infants and their families are needed. Social service, mental health, and medical service providers are highlighted as key intervention sources in preventing child maltreatment of disabled children (Montoya, Giardino, & Leventhal, 2010), and these same individuals are critical to the prevention of maltreatment of NICU infants.

A parent’s inability to psychologically adjust to the NICU experience, develop an appropriate attachment to their baby, and build confidence to execute care-taking tasks, may result in poor parenting outcomes post-discharge. Nandyal, Owora, Risch, Bard, Bonner & Chaffin (2013) conducted a study looking at caregiver burden as a risk factor for child maltreatment of NICU children. This study found that out of 2,463 NICU graduates, 523 (21%) received at least one report for child maltreatment between 2-6 years post discharged (median 3.2 years). This study observed a pattern of abuse, with children being at higher risk during the

first year of life, and the first month of life being the highest reporting period. Nandyal et al.'s (2013) study identified a correlation between caregiver burden and increased child welfare reports, with higher caregiver burden increasing risks for received child welfare reports. In addition, the study determined maternal age, history of child welfare reports, and total number of children in the family as independent family risk factors.

Hall, Kronborg, Aagaard, & Brinchmann (2013) found that mothers expressed stress, anxiety and loss due to a premature birth. Furthermore, these mothers felt physically and mentally rushed into motherhood without the time needed for adjustment to the circumstances. In Hall et al.'s (2013) study, NICU mothers reported being anxious and unable to form intimate attachments to their premature infants due to a fear of death and loss.

Attachment is crucial for mothers and infants in a NICU setting. Mehler, Wendrich, Kissgen, Roth, Oberthuer, Pillekamp, & Kribs (2011) identify a "sensitive period" to develop an attachment for very low birth weight, preterm infants. They conclude that infants who were able to see their mothers within three hours after birth were more likely to develop a secure attachment pattern at 12-18 months of life. Similarly, Hall et al., (2013) found that mothers reported the best way to form an attachment with their infant was through holding the infant skin-to-skin.

Attachment and Child Maltreatment

Attachment theory provides a strong foundation when considering child maltreatment interventions for NICU graduates. Attachment theory is unique, as it is an evidenced-based approach that has been thoroughly researched (Berzoff, Flanagan & Hertz, 2011). Attachment theory requires practitioners and researchers to assign importance to earlier experiences and their effects on the emergence of current interpersonal relationship patterns (Berzoff et al., 2011;

Bowlby, 1970). This perspective helps conceptualize child maltreatment interventions with a mother-infant focus. The notions of infant proximity needs and “parental empathic attunement” help to conceptualize the need to develop interventions which support and nurture this dyad (Berzoff et al., 2011; Bowlby; 1970).

Attachment theory is espoused in many of the research studies exploring child maltreatment and, in this discussion, represents the strongest theory associated with the prevention of child maltreatment. Bowlby’s attachment theory espouses that organisms have attachment systems (Bowlby, 1970). These attachment systems are adaptable and serve to protect the young of any species by keeping them in close vicinity to older animals (Berzoff et al., 2011). According to Bowlby, the quality of an infant’s early attachments to caregivers has profound implications for the formation of later trusting relationships. Attachment theory reflects an early collaboration between Bowlby and his associate, developmental psychologist Mary Ainsworth. Broadly speaking, human attachment systems are considered secure or insecure and reflect a child’s capacity to use a caregiver as a secure base (Berzoff et al., 2011; Bowlby, 1970; Ainsworth & Bowlby, 1991). Attachment systems are defined as infant movement toward or in proximity of a mother or primary caregiver especially in times of distress, and have two critical developmental goals – security and exploration. Attachment systems usually develop between 6-12 months (Berzoff et al., 2011). Bowlby noted that securely attached infants use an attachment figure as a kind of safe base and in time develop a representational model of attachment figures that are available, responsive, and can be counted upon (Bowlby, 1970; Bowlby, 1988). In addition, Ainsworth and Bell (1970) identified two categories of insecure attachment: insecure avoidant and insecure ambivalent/resistant. The insecure avoidant infant is often exposed to a caregiver who is rejecting, unavailable, or

unresponsive to the infant's needs; as a result, the infant develops a physical and emotional pseudo-independence, and do not seek contact with and comfort from the caregiver when distressed. The insecure ambivalent infant is unable to depend on the caregiver to be there when needed and consequently has difficulty separating from the caregiver and being soothed upon reunion after a separation. Some years later, Main and Solomon (1986) identified a third type of insecure attachment: disorganized attachment. Children exhibiting disorganized attachment demonstrate a mixture of avoidant and resistant behavior with regard to their caregivers, often appeared dazed and confused; caregiver behavior often is erratic and unpredictable, and it has been speculated that these caregivers may have themselves suffered from significant maltreatment as children.

The nature of the attachment relationship between infant and caregiver is critical in determining risk and the capacity for resiliency not only during infancy but in all stages of development; children whose attachment experiences have been characterized by separations, losses, and inconsistent, neglectful, or abusive caregiving often find their way into the child welfare, medical, and mental health systems (Applegate & Shapiro, 2005). The association between an infant's early attachment experiences and physical, social, and emotional risks to wellbeing is critical to understand and assess especially, when it comes to NICU graduates who have started their lives with significant medical risks and accompanying separations from their caregivers.

According to attachment theory, the regulatory system provides a biological perspective to the mother-infant dyad (Fonagy, 2001). Infant behaviors (smiling, crying, and speech) are discussed in terms of biological needs and responses (Fonagy, 2001). In as early as forty-one minutes after birth, infant brains are innately and socially capable of imitating others through

activating the mirror neuron system (Bloom & Farragher, 2010). The rapid development of the brain, directly related to attachment, makes the first year of life crucial for developing attachment bonds between caregiver and infant (Humphreys & Kiraly, 2011). It is this “emotional memory”, a control function of the amygdala, present at birth, which allows emotions to keep individuals safe and secure after birth (Humphreys & Kiraly, 2011). Bloom & Farragher (2010) define attachment as the “human operating system”. Siegel (1999) explains the neurobiology of interpersonal relationships as patterns in brain functions that are activated in particular relationships and can be differentiated for each caregiver, and he (1999) concludes that interpersonal relationships influence the neurobiological state of the infant brain.

Developmental biology and neurobiology also help explain attachment in terms of the body’s regulatory systems. Secure attachments are described as efficient in activating neuropeptides, neuromodulators, and neurosteroids which are critical in regulating social behavior (Schore, 2012). The activation of these chemicals through the body’s regulatory systems is important for the creation of social bonds and further brain development (Schore, 2012). Schore (2012) asserts that attachment experiences are believed to have a long-term impact on the hypothalamic-pituitary-adrenocortical (HPA) system, central nervous system (CNS) and autonomic nervous system (ANS). Therefore these systems are considered directly related to attachment relationships and experiences (Schore, 2012). Schore (2012) describes attachment trauma as a caregiver’s hyper-intrusiveness or emotional absence and disengaged responses to an infant’s emotion and stress cues. An infant’s response to attachment trauma is hyper-arousal, or dissociation (Schore, 2012). These responses involve distress, fear, and terror which trigger the ANS system and biologically presents as tachypnea, tachycardia and increased blood pressure (Schore, 2012). The sympathetic hyper-arousal system in the brain releases

corticotropin releasing factor (CRF) to react to the stress and mediate the infant's emotional response (Schoore, 2012). Another distressed response is dissociation, in which the infant withdraws from external stimuli (Schoore, 2012).

Attachment theory has evolved based on technological advances in neurobiology. We know that the growth of the brain continues through adolescence into early adulthood (Lanius et al., 2012). Neuroimaging, functional connectivity, functional magnetic resonance imaging (fcfMRI), and resting state functional magnetic resonance imaging (fMRI) highlight brain activity during states of rest in the default mode network (Lanius et al., 2012). The default mode network (DMR) involves several regions of the brain which are linked to self-referential processing, stream of consciousness, theory of mind, autobiographical memory, and futuristic thinking (Lanius et al., 2012). This connection to self-consciousness has contributed to the belief that psychiatric disorders involve a neurodevelopmental foundation, particularly evident in post-traumatic stress disorder (PTSD) and extreme stress disorders (Lanius et al., 2012).

Attachment involves the parent's capacity to mentalize through exercising compassion, understanding, warmth and sympathy in response to the infant's needs (Berzoff, et al. 2011). This notion of parental empathetic attunement stresses the parental role in the mother-infant dyad (Berzoff et al., 2011). Humans are not born with the capabilities of self-regulation; therefore, a dyadic system is required to regulate infant emotions through empathy, understanding, and the attuned responses of the caregiver (Fonagy, P., Gergely, G., Jurist, E.L., & Target, M., 2002). Ultimately, the infant's ability to empathize is directly connected to the caregiver's ability to mentalize the child's needs (Fonagy et al., 2002). Schoore (2012) asserts that when parents misattune and are unable to mirror their infants' emotions optimally, there is a disruption in the

attachment/bonding process. Disruption in the maternal-infant attachment results in regulatory failure and impaired autonomic homeostasis (Schoore, 2012).

A caregiver's inability to establish attachment bonds increases child maltreatment risks. Alexander (2013) identifies problems, or disruptions, in affect communication as the cause for disorganized attachments. A mother's misattunement (i.e. inappropriate responses and contradicting communications) results in a disorganized attachment (Alexander, 2013). Mothers who do not attune to their infant offer reduced protection to their infants, and this heightens the potential for subsequent trauma for the infants (Alexander, 2013). In addition, a maternal history of trauma and loss, helplessness, and aggressive parenting provides additional risk factors for child maltreatment (Alexander, 2013). Crittenden & Ainsworth (1989) state that neglected children learn that their communication is unsuccessful in getting their needs met or receiving cooperation from their mothers, and as a result, they often display characteristics of anxious and disorganized attachments.

Muzik, Ads, Bonham, Rosenblum, Broderick, & Kirk (2013) illustrate the influence of trauma on parenting. Muzik et al. (2013) conducted a qualitative study with mothers who had a history of childhood maltreatment, and they found that these mothers with a history of childhood abuse (i.e. emotional and physical neglect, emotional and physical abuse, sexual abuse and severe abuse) often were ambivalent in seeking help due to personal shame. These women identified the postpartum period as a time of increased awareness of impairments with social skills that were never learned prior to having an infant (Muzik et al., 2013). One mother discussed confusion about her infant's routine child care needs and acknowledged uncertainty about appropriate responses to her child (Muzik et al, 2013). Mothers stated that their childhood experiences undermined their parental intuition and sensitivity (Muzik et al., 2013).

In the context of child maltreatment, Crittenden & Ainsworth (1989) state that mother-infant attachment is not unidirectional when considering causation. Instead, mother-infant attachment places focus on earlier attachment experiences which shape coping patterns over time and frame the caregiver's perceptions of threats (Crittenden & Ainsworth, 1989). Similarly, Baer & Martinez (2008) identify disorganized attachments as enduring over time and predictive of poor development outcomes, issues with stress management, externalizing behavior problems, and dissociative behavior of the child. Shemmings, Shemmings, & Cook (2012) state that disorganized attachment experiences in childhood often continue through adolescence and adulthood, and can lead to mental health problems. They associate child abuse with disorganized attachment resulting from caregiver trauma, loss, and a limited capacity for mentalization.

Addressing Parenting Challenges in the NICU

There are many ways in which health care staff can impact the parenting experience in the NICU both positively and negatively. Sheeran, Jones, & Rowe (2013) identified some NICU nursing behaviors that restrict the ability of parents to provide care to their infants. Some mothers felt that their individual infant's needs were not met based on work flow and assignments in the NICU. Mothers believed that they were not provided with complete, comprehensible, and consistent information about their infants, and also considered NICU policies and procedures restrictive, feeling that they were often excluded from the decision-making process (Sheeran et al., 2013). Particularly, adolescent mothers expressed power struggles with staff when parenting their children. These adolescent mothers felt constrained from providing care and parenting (i.e. bathing, feeding, holding) their children without first obtaining permission from NICU nurses (Sheeran et al., 2013). They felt like they were being treated as outsiders and viewed staff as either good or bad based on their parenting experience

and staff interaction (Sheeran et al., 2013). Conversely, adult mothers were more capable of fostering positive relationships with staff and adopting successful strategies to negotiate the NICU (Sheeran et al., 2013).

Bader (2012) identifies the role of NICU providers as more than life saving. He sees the role as affecting the development of the neural pathways of the newborn infant, and as such, NICU clinicians should facilitate the necessary skills and techniques to aid the infant's brain wiring system (Bader, 2012). He recommends proprioceptive input, positive touch and infant massage as ways of minimizing infant stress. There is extreme fear, trauma and stress associated with parenting an infant in the NICU and medical providers are encouraged to motivate parents to touch their infants and educate parents about how interaction with their infant can impact the development of the infant brain (Bader, 2012). NICU parents should also be taught how to read infant avoidance cues and appropriately respond. Bader suggests that by following these guidelines, parents will reduce their own stress and increase their confidence in completing care activities for their NICU infants (Bader, 2012).

NICU providers can promote positive mother-infant interaction. White-Traut (2015) highlights the importance of social interaction in reducing stress reactivity response for infants in the NICU. Auditory, Tactile, Visual, and Vestibular (ATVV) intervention is a developmentally appropriate sensory stimulus technique that involves mother's voice, rocking, moderate touch/stroking, and maternal eye contact (White-Traut, 2015). It is believed that developmentally appropriate sensory stimuli can mitigate the noisy, stress invoking NICU environment and improve long-term neurodevelopmental outcomes for infant (White-Traut, 2015). ATVV is a useful method to improve parenting interaction and parenting skill with NICU infants which may mitigate parenting challenges.

Family Centered Care (FCC) may be a quality of care model to address NICU parenting concerns and support the unique needs of parents with infants in the NICU. FCC is a model of hospital practice that can help reduce a parent's anxiety in the NICU and increase parental competence through involvement in infant care and participation in the decision-making process (Croft, 2012; Gooding, Cooper, Blaine, Franck, Howse & Berns, 2011). It can also provide a foundation to mend disrupted parent-child attachments resulting from the NICU setting (Gooding et al., 2011). Health care providers are encouraged to increase their communication with families as a means to foster the parents' abilities to provide care to their babies (Gooding et al., 2011). The FCC model urges NICU staff to partner with families and schedule infant care needs around the parents' schedules in order to improve parental participation. In addition, the FCC model of practice supports parental involvement in care rounds, which promotes their inclusion in the feedback loop and care planning. The FCC model also encourages full parental access to infant and medical information through family centered policies and practices (Gooding et al., 2011). It is believed that these initiatives can provide the support parents need to be successful with care giving tasks once the baby is discharged (Gooding et al., 2011).

There is increasing awareness of the role of health care providers in preventing child maltreatment (Brewer et al., 2012; Friedlander, et al., 2005; Friedman et al., 2012; Giardino, Hanson, Hill, & Leventhal, 2011; Hibbard & Desch, 2007; Thomas & Mott, 2013). As the health care community takes more responsibility for the identification of children at risk and in need of protection, there is a growing awareness of the need for the development of child maltreatment interventions at the medical provider level, and a need for specialized child welfare services to address the unique needs of special needs children. It is also essential to develop evidenced-based maltreatment prevention strategies for the special needs of NICU graduates.

Strategies for the Provision of Human Milk for NICU Infants

Breastfeeding may be one child maltreatment prevention strategy. Understanding the process of breastfeeding in a NICU environment helps with examining it as a possible intervention for child maltreatment. The American Academy of Pediatrics (AAP) recommends exclusive breastfeeding for the first 6 months of an infant's life and continued breastfeeding with food from 6-12 months (Castrucci, Hoover, Lim, & Maus, 2007.; Colaizy & Morriss, 2008; Spatz, 2006). In 2012, the AAP reaffirmed its 6 months recommendation for exclusive breastfeeding and human milk for standard infant feeding and nutrition (AAP, 2012). The World Health Organization (WHO) and the United Nations International Children's Emergency Fund require the promotion of breastfeeding (Boucher, Brazal, Graham-Certosini, Carnaghan-Sherrard, & Feely, 2011), and Healthy People 2010 includes increased breastfeeding rates as an established goal (Castrucci et al., 2007; Colaizy & Morriss, 2008).

In general, there are few medical circumstances in which at breastfeeding or the use of mother's own milk is contraindicated (AAP, 2012). It is not recommended that mothers who have tested positive for human T-cell Lymphotropic Virus Type I or II and/or untreated brucellosis (Bang's disease) breastfeed or express milk for their infants (AAP, 2012). Breastfeeding is contraindicated for infants with certain metabolic disorders (however, special protein-free or adapted formulas can be alternated with breastfeeding) and mothers with active untreated infectious tuberculosis or herpes simplex lesions on the breast cannot breastfeed but under these circumstances, milk can be expressed from the breast and provided to infants (AAP, 2012). Methods similar to those used to address tuberculosis and herpes lesions should be followed for women who acquire H1N1 Influenza and varicella 5 days prior to delivery and 2 days post-partum (AAP, 2012). Breastfeeding is contraindicated for HIV-positive women in

industrialized countries, but not in developing countries, due to the cost-benefits of breastfeeding (AAP, 2012). In addition, substance abuse and smoking are not generally contraindicated for breastfeeding under treatment and support conditions (AAP, 2012). Breastfeeding is permissible with alcohol consumption; however, there are recommended guidelines for minimal consumption (AAP, 2012). Breastfeeding and medication recommendations are determined on a risk-benefit basis when there are limited contraindications (AAP, 2012). In general, breastfeeding is not recommended with amphetamines, chemotherapy agents, ergotamines, and statins.

Breastfeeding in the NICU is a complex process. Breastfeeding is feeding at the breast and the methods used to facilitate the provision of human milk to the infant. Healthy full-term infants are more successfully able to latch to their mother's breast immediately after birth, however, the clinical instability of the NICU hinders an infant from achieving an adequate latch to their mothers to initiate breastfeeding. Hence, breastfeeding in the NICU includes the strategies of feeding at the breast (Spatz, 2004; Spatz, 2011), expression of human milk using an electric breast pump (Spatz, 2004; Spatz, 2006; Spatz, 2011), and the use donor human milk (Dovanzo, Monasta, Ronfani, Brovedani, & Demarini, 2012). When NICU babies are unable to latch, they may receive expressed mother's milk by an electric breast pump, a hand pump, or the hand. Once breast milk is expressed from an electric pump or hand pump, it is provided to the infant through various methods including orogastric tubes (OG), nasogastric tubes (NG), cup, finger feeding, bottle feeding, or supplemental nursing systems (SNS). The goal of these feeding methods is to initiate and preserve milk supply until the infant is able to latch and begin infant-driven feeding. Expressed breast milk or donor milk can be provided or supplemented with a tube, cup or bottle; however, bottles are normally discouraged (Nyqvist, 2013). NICU mothers

must simulate the feeding patterns of a full-term infant through the use of a hospital grade electric pump (at home and in the hospital) to develop and maintain a milk supply (Hallowell & Spatz, 2012; Spatz, 2004; Spatz, 2006). Based on the infant-mother separation during a NICU admission, creating a pumping schedule is important to creating and protecting the mother's milk supply.

The strategies for human milk provision in the NICU consider infant benefits. Human milk is the best nutrition option for NICU infants (Parker, Burnham, Cook, Sanchez, Philipp, & Merewood, 2013) therefore crafting the most appropriate feeding method is crucial. The medical benefits of breast feeding for NICU infants are well documented and include long-term cardiovascular benefits, decreased obesity and atopic disorders (Colaizy & Morriss, 2008), improved neurodevelopmental outcomes (AAP, 2012; Colaizy & Morriss, 2008; Bernaix, Schmidt, Jamerson, Seiter, & Smith, 2006; Vohr, Poindexter, Dusick, McKinley, Wright, Langer, & Poole, 2006), and gastrointestinal, immunologic, and psychological benefits (Boucher et al., 2011; Callen & Pinelli, 2005). Other benefits include improved physical development (Boucher, et al., 2011; Colaizy & Morriss, 2008), reduced risk for necrotizing enterocolitis (NEC), hospital acquired infections (AAP, 2012; Bernaix, et al., 2006), sepsis (Chapman, 2013), retinopathy of prematurity (Bernaix et al., 2006), and protection from white matter brain-related injuries (Kotey & Spatz, 2013). In extremely premature infants, the AAP (2012) cites studies that conclude high proportions of human milk for premature infants result in greater scores in motor development, cognitive development and behavior ratings between the ages of 18 and 30 months.

Risks are also considered when developing strategies for human milk provision. Spatz & Lessen (2011) state that infants who are not breastfed are at greater risk for Sudden Infant

Death Syndrome (SIDS), necrotizing enterocolitis, mortality, obesity, pain, and temperature and respiratory dysregulation. Spatz & Lessen (2011) also identify a higher risk of atopic dermatitis, childhood cancer, asthma, cognitive/brain development, and Type 1 and Type 2 diabetes as long-term adverse outcomes for non-breastfed infants. In addition, Spatz & Lesson (2011) identify bottle feeding risks which include pathogen contamination, formula adulteration, phytoestrogens in soy formula, and soy induced osteopenia in preterm, low birth weight infant. In terms of maternal risks, Spatz & Lessen (2011) identify women who do not breastfeed as being at higher risk for breast cancer, ovarian cancer, cardiovascular disease, type II diabetes, metabolic syndrome, rheumatoid arthritis and osteoporosis in contrast to women who breastfeed.

The strategies for human milk provision are developed to address the unique clinical needs of the NICU infant. There are challenges to breastfeeding and providing human milk to premature infants, as they are often not able to breastfeed immediately and must learn to breastfeed when they progress to a more physiologically and medically stable level (Callen & Pinelli, 2005; Maastrup, et al., 2012). NICU infants, who present with fussy and hungry behavior and have a weak suck response, may also refuse the breast (Callen & Pinelli, 2005). In order to breast feed, infants must be at the appropriate gestational age and developmentally ready to feed and master anatomic and physiologic barriers, using muscles to coordinate sucking, swallowing and breathing (Callen & Pinelli, 2005). They often need to overcome the challenges of transitioning from gavage (tube) feeding to breast initiation (Callen & Pinelli, 2005). NICU infants must correctly apply oral latching techniques and sucking patterns to successfully breastfeed and avoid nipple confusion (Callen & Pinelli, 2005).

Feeding at the breast for preterm NICU infants is further complicated by the clinical course. Greene et al. (2013) assert that preterm infants are extremely susceptible to health issues

that can impede proper breastfeeding. Preterm infants often have comorbidities (i.e. respiratory difficulties, infections, neurological impairments) that significantly reduce their capabilities (Greene et al., 2013). In addition, mechanical devices (extended intubation with nasal or tracheal devices) may lead to the development of feeding aversion in preterm infants (Greene et al., 2013). In response to the complex challenges of oral feedings, Greene et al. (2013) discuss the need to explore interventions that focus on the preparedness (i.e. weight, gestational age, oral motor skills, and feeding techniques and experience) of infants to safely feed orally. Ideally, oral stimulation techniques should decrease oral hypersensitivity, strengthen muscles, enhance motor organization, and support reflex behaviors to facilitate nutritive sucking (Greene et al., 2013). The review of oral stimulation techniques by Greene et al. (2013) may offer specific and more complex considerations for infants with breast feeding initiation plans.

The strategies to provide mother's own milk considers the ability to intake nutrition orally as a difficult task for a preterm infant (Greene, O'Donnell, & Walshe, 2013). Greene et al. (2013) stated that in order for a preterm NICU infant to safely transition from gavage to oral feeding, he/she must coordinate muscles (i.e. lip, jaw, tongue, pallet, upper trunk, pharynx, and respiratory system). In addition, Greene et al. (2013) contend that the brain stem and normal sensory functions are also required to allow for reflexes (i.e. rooting, sucking, swallowing, gagging). These skills and capabilities need to occur at a specific developmental stage for a NICU infant to successfully feed orally (Greene et al., 2013).

There may be particular challenges with the provision of human milk for late-preterm infants. The late-preterm infant may be admitted into a NICU and can have morbidity risks due to physiologic and neurodevelopment immaturity (Hallowell & Spatz, 2012). Late preterm infants are discharged earlier than preterm infants, and this may exacerbate feeding problems and

increase risk of weight loss, dehydration, and hyperbilirubinemia (Hallowell & Spatz, 2012). The Spatz Ten Steps for Promoting and Protecting Breastfeeding for Vulnerable Infants (Ten Steps) are designed to support breastfeeding late-preterm infants (Spatz, 2004). These ten steps include 1) informed consent, 2) establishment and maintenance of milk supply, 3) breast milk management, 4) feeding of breast milk, 5) skin-to-skin care (SSC), 6) non-nutritive sucking at the breast, 7) transition to breast, 8) measuring milk transfer, 9) preparation for discharge, and appropriate follow-up (Spatz, 2004). Hallowell & Spatz (2012) state that the Ten Steps were designed to support breastfeeding for late-preterm infants who may display feeding difficulties, and The Ten Steps can help improve developmental and nutritional outcomes. The feeding strategies for NICU infants are important as the provision of mother's own milk is a natural and healthy way to encourage and support parenting practices in the NICU.

The strategies developed to provide human milk must consider maternal challenges. The initiation of breastfeeding and the delivery of human milk for NICU mothers involve physical and mental challenges. The physical barrier is maintaining a milk supply during a time when the health and strength of the mother and infant have been compromised (Parker et al., 2013). In general, NICU mothers must rely on electric breast pumps to extract milk from their breasts in order to provide breast milk for their infants (Parker et al., 2013). The mechanical breastfeeding option poses unique psychological challenges for NICU mothers (Parker et al., 2013).

While all mothers are disconnected from their infants based on a delivery process, this experience is magnified for NICU mothers whose prenatal journey is prematurely interrupted (Hurst et al., 2013). This notion of interruption in the maternal role exacerbates feelings of separation (Hurst et al., 2013). Mothers regard a breast pump as both a tie and wedge between the infant and themselves, and many NICU mothers describe the breast pump as an extension of

themselves, suggesting that they are forming attachments to a machine as opposed to their infant (Hurst et al., 2013). They described experiencing “letdowns” when thinking about the breast pump as opposed to thinking about their infants (Hurst et al., 2013). NICU mothers reported losing the response to the infant’s cues (crying), and instead developing a pumping routine, or setting an alarm clock to announce when it was time to pump (Hurst et al., 2013). The mothers disliked the pumping process and instead of thinking about their babies while pumping, would use diversionary tactics to overcome mental challenges in the pumping process (Hurst et al., 2013). Some mothers used negotiation as an adaptive strategy to provide breast milk for their infants (Hurst et al., 2013); these negotiation strategies involve not only resolving and managing time, breast pump equipment, and diversionary tactics (self-negotiation and thinking about their babies), but also adjusting to the NICU environment and physical bodily sensations. The process of breast initiation is a paradoxical experience for mothers of preterm infants (Hurst, Engebretson, & Mahoney, 2013).

The stress resulting from the NICU environment can affect the provision of human milk. Doulougeri, Panagopoulou, & Montgomery (2013) conducted a study examining the influence of maternal stress on breastfeeding initiation, frequency, duration, and milk volume. Mothers with healthy full-term infants were observed, milk was expressed using an electric breast pump, and mothers received standard nursing guidance for breastfeeding, and shortly after delivery, cortisol levels were measured to determine the mothers’ stress levels. This study found a negative association between psychological stress and initiation of lactation, milk volume, and frequency and duration of first feeding. It is believed this data provides evidence that maternal stress serves as a risk factor for postponed establishment of breastfeeding (Doulougeri et al., 2013). The Doulougeri et al. (2013) study showed that breastfeeding may serve as a moderator between

maternal stress and infant health. Maternal stress is a risk factor for delayed breastfeeding and can compromise the establishment of breastfeeding which in turn can reduce benefits to the child and alter the maternal protective role (Doulougeri et al., 2013). This study has strong implications for NICU mothers who may have higher maternal stress levels associated with having a preterm infant in the NICU.

The strategies for human milk provision must also consider the maternal challenges with the NICU environment. New mothers must bond and maintain lactation progress under the noise and stress of the NICU (Callen & Pinelli, 2005). The NICU environment is particularly challenging as it does not offer privacy for mothers attempting to bond with their infants and initiate breastfeeding (Castrucci et al., 2007). As such, the NICU environment requires an increased need for support in many instances (Castrucci et al., 2007). In order to successfully provide human milk in the NICU, new mothers are required to cope with the physical, mental and emotional stress while attempting to learn and execute “good enough” parenting skills (Castrucci et al., 2007).

The Spatz Ten Steps (Spatz, 2004) and the WHO 10 Steps to Promote and Protect Breastfeeding for Vulnerable Infants provides a 10-point plan to protect, promote, and support breastfeeding (Hallowell & Spatz, 2012). Both lactation support models are meant to provide maternal and institutional support for human milk provision strategies. Hallowell & Spatz (2012) outline the WHO 10 Steps to Promote and Protect Breastfeeding for Vulnerable Infants as written breastfeeding policy and daily communication with staff (step 1), encouraging the training of staff in policy, informing women about the benefits of breastfeeding and the management of breastfeeding (step 3), recommending assistance with breastfeeding initiation 30 minutes after birth (step 4), allowing the mother to learn how to breastfeed and maintain milk

supply when separated from her infant (step 5), enforcing breast milk only feeds when medically appropriate (step 6), encouraging 24-hour rooming in for infant and mother (step 7), promoting on demand breastfeeding (step 8), discouraging pacifiers and artificial teats for breastfeeding infants (step 9), and supporting the development of breastfeeding support groups to encourage mothers' participation (step 10). A significant difference between the two models is that the Spatz Ten Steps targets the specific issues experienced by vulnerable infants (Spatz, 2004).

The provision of human milk strategies is *breastfeeding* in the NICU. The challenges with human milk provision provide NICU parenting opportunities for mothers. NICU mothers must overcome the challenges of human milk provision in order to be successful in providing her own milk to infant. The provision of human milk may serve as a child maltreatment intervention as it provides the mother with parenting challenges to overcome and enhances attachment. Mothers who overcome these challenges are able to cope with NICU parenting challenges and improve attachment bonds with infant. Lactation support models help support human milk provision strategies and support mothers parenting efforts.

The Provision of Human Milk and Breastfeeding as a Protective Factor for NICU

Infants and Graduates

When successful, breastfeeding can provide physical benefits to mothers (AAP, 2012). Specifically, breastfeeding mothers have decreased blood loss and a faster reduction of the uterus to its pre-pregnancy size. Women who breastfeed may have more spacing between children as a result of lactation amenorrhea, and breastfeeding duration is associated with decreased risk for type I diabetes mellitus per year of breastfeeding for mothers with no prior history of gestational diabetes (AAP, 2012). There is an association between breastfeeding and reduced incidents of rheumatoid arthritis and adult cardiovascular disease in women, and an inverse relationship

between breastfeeding and rheumatoid arthritis in women with a cumulative (12-23 months) lactation history. In addition, women who successfully breastfeed may decrease the risk of postpartum depression and reduce incidents of abuse and neglect abuse (AAP, 2012).

The provision of human milk and breastfeeding strengthens attachment. Rossman, Kratovil, Greene, Engstrom, & Meier (2013) conducted a qualitative study on the effects of mother's milk on very low birth weight and premature infants who spent time in the NICU. The theme in this study was a mother's faith that her milk would heal her infant (Rossman et al., 2013). Mothers expressed increased motivation at seeing the result of weight gain and infant stability. These positive infant outcomes reinforced the maternal nurturing role, supported bonding and helped the mothers heal from the trauma of delivery. In Rossman et al.'s (2013) study, only 30% of mothers described the paradox of pumping (dislike of pumping while understanding the benefits) and perceived pumping as reestablishing the prenatal connection that was lost due to the premature birth. The mothers described the routine of pumping milk as ritualistic, and stated that it served to maintain a biological connection, caretaking responsibility, and respite needs (Rossman et al., 2013). Mothers expressed reward in helping their infants grow and heal, and even mothers who could not maintain sufficient milk volume continued pumping because they had faith that their infants were healing with the milk they could provide (Rossman et al., 2013).

Mothers can overcome parenting challenges and achieve successful outcomes with human milk provision and breastfeeding. Fugate, Hernandez, Ashmeade, Miladinovic, & Spatz, (2015) found that the Spatz Ten Steps significantly improved the number of mothers expressing their own milk 6 hours after delivery. Martino, Wagner, Froh, Hanlon & Spatz (2015) discovered that infants with complex anomalies requiring surgery had successful feeding

outcomes through the provision of human breast milk and breastfeeding largely based on the implementation of the Spatz Ten Steps for Promoting and Protecting Breastfeeding in Vulnerable Infants (Ten Steps). The study cited breastfeeding rates higher than the state and national averages at three-month post-discharge with one-third of mothers using more than one method to feed human milk to their infant. At six-months, a majority of the participants in the study continued breastfeeding with an average duration of eight-months, however between 6-12 months a majority of women ceased to breastfeed or pump. In a follow-up survey, mothers cited stress, low milk supply (a potential byproduct of stress), and return to work as common reasons for discontinuing pumping and breastfeeding. Martino et al., (2015) credited maternal resiliency, commitment to demanding pumping regimen, and overcoming hurdles as reasons for increased rates of breastfeeding. The implementation of quality lactation support post-discharge, increased access and provisions for lactation support services, programs, and pumping equipment is recommended (Martino et al., 2015).

There is only one known research study that examines breastfeeding and child maltreatment. Strathearn, Mamun, Najman, & O'Callaghan (2009) conducted a 15-year Australian study to determine if breastfeeding served as a protective factor for maternally-perpetrated child maltreatment of healthy newborns. Strathearn et al. (2009) assert that their study was the first to analyze the correlation between breastfeeding duration and later child maltreatment. The conceptual framework for attachment theory underlies Strathearn et al.'s (2009) study. The study followed mother-infant dyads and examined breastfeeding length of time in relation to child maltreatment (emotional abuse, physical abuse, and neglect). In addition, Strathearn et al. (2009) analyzed child maltreatment records for substantiated child abuse reports. The Strathearn et al. (2009) study shows that of the total number (512) of

children with substantiated child abuse reports, more than half (60%) experienced at least one or more incident of maternal-perpetrated abuse or neglect. There is an inverse relationship that showed increased maternal maltreatment and decreased breastfeeding duration, determined by an odds ratio (Strathearn et al., 2009). The odds of maternal maltreatment in non-breastfeeding children are 4.8 times the odds of children breastfed for 4 or more months (Strathearn et al., 2009). The odds for non-breastfed children decreased to 2.6 times higher when adjusted for confounding variables such as cigarette use, binge drinking, anxiety, and attitudes about pregnancy (Strathearn et al., 2009). Maternal neglect was independently associated with breastfeeding duration and increased four-fold for non-breastfed children compared to those breastfed for four months or greater (Strathearn et al., 2009)

While the Strathearn et al. (2009) study reveals interesting and important data for breastfeeding and child maltreatment outcomes for healthy newborns, there are some methodological limitations that must be taken into account. Strathearn et al., (2009) used a limited definition of child maltreatment (child welfare agency definition) which may have distorted information between state-reported data, maternal reported data, and observed maternal behavior. While the Strathearn et al. (2009) study design decreased the strength of causal inferences, it is important to note that a randomized control trial would be both unethical and unfeasible based on the benefits of breastfeeding. In addition, self-report measures were used to identify confounding variables which posed a risk of biasing the results (Strathearn et al., 2009). Finally, the study utilized agency child welfare records and in some cases, there was missing and inaccurate data, and the study also had discrepancies in case selection based on socio-demographics and ethnicity (Strathearn et al., 2009). The researcher recommends additional examination of maltreatment reports and/or mother-infant interactions but cautions that causality

will remain indirect, based on an inability to differentiate between the effects of breastfeeding and any proposed intervention (Strathearn et al., 2009).

The provision of mother's own milk may improve both mother and infant interactions, enhance maternal mental health, and decrease child maltreatment. Breastfeeding and the provision of human milk is a caregiving task that fosters attachment and bonding between the mother-infant dyad, fulfills a biological and physiological need, and emphasizes mutuality. In a relationship of mutuality, the mother physiologically responds to infant cues and the infant responds to physiological gratification. The strength of this intervention is its ability to provide positive reinforcement of the relationship between the mother and her infant.

Implications for Research

While the NICU parenting literature discusses the need to promote and support parenting in the NICU, there is no information on the potential for maltreatment of NICU children or optimal parenting methods to prevent maltreatment for this specialized group. The existing research addresses parenting for NICU children with a focus on establishing adjustment and improving mental health outcomes (Bergstrom, et al., 2012; Carter, Mulder, Bartram, Darlow, 2005; Carter, Mulder, Framptom, Darlow, 2007; Hall et. al., 2013; Hodgkinson, et al., 2014; Howland, 2007; Jones, Rowe, Becker, 2009; Jotzo & Poets, 2005; Lasiuk, et al., 2013; Mehler et al., 2011; Montiroso, Provenzi, Calciolari, & Borgatti, 2011; Sheeran, et al., 2013; Tandberg, et al., 2013; Thomas, Renaud, DePaul, 2004). There is also emphasis on the need to support parents when they transition from the NICU to home (Hurst, 2006; Nearing et al.; Nottage, 2005). In terms of NICU specific child maltreatment, prevention efforts to date focus solely on shaken baby syndrome (Carbaugh & Gracey, 2004) and draw attention to post discharge risk associated with maltreatment related to caregiver burden (Nandyal, et al., 2013).

There is no research looking specifically at disrupted attachment and maltreatment of NICU graduates. There is also no literature regarding child maltreatment intervention strategies that emphasize attachment bonds for mothers and NICU infants. Overall, the literature does not identify specific, evidenced-based interventions directed toward special needs NICU children with the primary focus to improve mother-infant interaction as a way to reduce child maltreatment.

A limitation in the majority of the child maltreatment research is its sole emphasis on the mother as the unit of intervention and support. The conceptual framework and theoretical grounding for interventions needs to be inclusive of the mother-infant dyad. In order to achieve optimal, successful child maltreatment interventions, the mother and child must mutually benefit. Interventions need to promote bonding and attachment in order to nurture physiological needs, while offering beneficial health outcomes for the infant, and enhancing mental health outcomes for both the parent and child. In pursuit of these intervention aims, attachment theory provides a comprehensive conceptualization of the mother-infant relationship and directly addresses the unique experiences of special needs NICU infants.

Conclusion

There is movement away from traditional methods of child maltreatment interventions. Modern interventions, which are perpetrator-focused, address impulse control, ego support, and self-regulation through parent education (Forrester, Westlake, & Glynn, 2012; Holman, 2011; Sanders, 2008). Modern child maltreatment assessment tools being examined include child input, and holistically address the child welfare continuum (Carter, 2012; Shiakou, 2012). There is growing awareness among child welfare practitioners and researchers that child welfare programs must improve the quality of services through their engagement with families, and

improving relational skills in order to obtain effective outcomes (Berrick, Young, Cohen, & Anthony, 2011; Forrester, Westlake, & Glynn, 2012; Holman, 2011; Sanders, 2008). Health care systems are redefining themselves as child maltreatment prevention and intervention service providers by exploring ways to improve services to address child maltreatment (Brewer Mitchell, & Tomlinson, 2012; Chavis, Hudnut-Beumler, Webb, Neely, Bickman, Dietrich, & Scholer, 2013; Diderich, Fekkes, Verkerk, Pannebakker, Velderman, Sorensen, Baeten, & Oudesluys-Murphy, 2013).

In using child maltreatment statistics, NICU graduates represent a high risk maltreatment group. Current child maltreatment statistics indicate that NICU graduates are especially vulnerable to abuse and fatal neglect based on their age group. The current and future clinical needs of NICU graduates only serve to increase their vulnerability. The stress that results from a NICU admission, parental mental health concerns, and inability to adjust to a stay in the NICU, impairs a parent's ability to learn and perform parenting functions. NICU parents are at risk for disrupted attachment which may trigger negative parenting trajectories that continue post-discharge. In addition, the NICU parent's inability to care for the immediate medical needs of NICU infants and the burden associated with later caregiving also poses risks to maltreatment. More research is needed in the area of child maltreatment of NICU children with specific attention to breastfeeding as a protective factor especially as it contributes to the promotion of parent-child secure attachment. Exploring breastfeeding and the provision of human milk as an intervention that utilizes an attachment based framework is ideal for NICU families. It is recommended that NICU medical providers conduct evidence-based research for child maltreatment and work to develop attachment interventions to keep NICU graduates safe at home.

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Accompanying Article

Breastfeeding: A Protective Intervention for Child Maltreatment of NICU Graduates

JaNeen Cross

Abstract: NICU graduates are at high risk for abuse based on their chronological age and are more vulnerable to fatalities from child maltreatment than infants who have not spent time in the NICU. Improving child-caregiver attachment may reduce child maltreatment of NICU graduates. Breastfeeding and the provision of human milk is a caregiving task that can strengthen attachment bonds, foster adaptation, and enhance coping skills for infants and caregivers in the NICU and post-discharge. Breastfeeding and using mother's own milk may serve as a protective factor against child maltreatment of NICU graduates. Social workers have a pivotal role in leading child maltreatment interventions in NICU settings and breastfeeding may be a valuable tool in keeping NICU children safe at home.

Introduction

Infants (defined as children under one year of age) in the United States have the highest child maltreatment victimization rate, with a unique victimization rate of 21.9 per 1,000 in 2012 (Department of Health and Human Services [DHHS], 2012). Neglect is the most prevalent overall form of child maltreatment. According to the DHHS (2012), 75% of maltreated children were victims of neglect, 18.3% were victims of physical abuse, and 9.3 % were victims of sexual abuse. Similarly, the National Child abuse and Neglect Data Set (NCANDS) data noted 77% of maltreated children were neglect victims and 25% physical abuse victims (Douglas & Mohn, 2013). High rates of infant child maltreatment is concerning as children exposed to maltreatment often deal with multiple types of abuse and increased frequency of abuse (Gilbert, Widom, Browne, Fergusson, Webb, & Janson, 2009).

Infants under the age of one have the highest abuse and fatality rates (Finkelhor & Jones, 2006; Friedlander, Rubin, Alpern, Mandell, Chrisitan, & Alessandrini, 2005; Friedman, Sheppard, & Friedman, 2012; Gilbert et al., 2009). Infants die from abuse and neglect at a rate of 18.8 per 100,000 children in that population, which is three times the death rate for children over the age of one, and seventy percent of total child fatalities occurred in children under the age of three (DHHS, 2012). In using data from the 2010 National Child Abuse and Neglect Data System (NCANDS), Douglas and Mohn (2013) found that the highest child maltreatment fatality rate (48%) were infants under the age of one and 80% of child fatalities were children under the age of 4 years old. NICU graduates may be at especially high risk for child maltreatment based on their special care needs and the care burdens related to those needs (Nandyal, Owora, Risch, Bard, Bonner & Chaffin, 2013).

More than half (54%) of abuse and neglect perpetrators are women; in 80% of child fatality cases, the identified perpetrators are parents (DHHS, 2012). Damashek, McDiarmid,

Nelson, & Bonner (2013) identify child neglect and fatal neglect perpetrators as predominantly female and biologically related to the victim. Welch & Bonner's (2013) study sample of maternal fatal neglect perpetrators identified 59% as White, 20% as African-American, 12% as American Indian, and 3% as Hispanic. Similarly, the NCANDS data identifies 51 % percent of mothers as perpetrators of fatal child maltreatment and US crimes statistics identify 52% of maternal perpetrators in child maltreatment fatalities (Douglas & Mohn, 2013). In examining child maltreatment fatalities for each state, child maltreatment fatalities can be even higher (Douglas & Mohn, 2013).

In examining maternal child maltreatment, Bundy-Fazioli & Delong-Hamilton (2013) conducted a study of maternal neglect perpetrators and concluded that these mothers were often struggling with a multitude of psychosocial constraints and their behaviors were often misunderstood or taken out of context by professional service providers. They suggest that maternal perpetrators are misjudged, and psychosocial factors are frequently overlooked when addressing parenting needs in the social service provider-perpetrator relationship. The 2010 NCANDS data shows that child maltreatment fatality perpetrators were generally in young adulthood, not single, and dealing with financial problems (Douglas & Mohn, 2013).

There are various reasons for caregiver perpetrated child maltreatment. A study was conducted to examine the caregiver factors related to the provision of child welfare services after an initial investigation (Fallon, Ma, Allan, Pillhofer, Trocme, & Jud, 2013). The caregiver risk factors for ongoing child welfare service provision to infants include intimate partner violence, cognitive impairments, history of foster care/group home, caregiver mental health, single-parent households, younger caregivers (18 years and younger), and minimal social supports (Fallon et al., 2013). These risk factors specifically include positive toxicology results at birth. Child risk

factors include fetal alcohol effects (FAE), developmental delays, attachment issues, and any physical, cognitive, and developmental disabilities (Fallon et al., 2013). Hospital referred reports had the highest rate (65%) for generating initial child welfare investigations (Fallon et al., 2013). This study has strong implications for NICU graduates who are at especially high risk of child maltreatment based on their chronological age (DHHS, 2012), vulnerability to special health care needs such as cognitive/physical impairments and developmental delays (Nandyal et al., 2013) and the psychosocial challenges faced by their caregivers (Bundy-Fazioli & DeLong-Hamilton, 2013).

Why are NICU Infants a Particular Concern?

Psychosocial Challenges

There are many psychosocial challenges to overcome in the NICU. NICU parents experience high levels of stress during the NICU course (Tandberg, Sandtro, Vardal, Ronnestad, 2013). The NICU infants' appearance can be frightening to caregivers, and caregivers are unable themselves to provide much care to their infants; this can result in enormous stress as caregivers experience difficulties associated with establishing significant levels of intimacy with their infants. Stress from having a child in the NICU can contribute to disrupted attachments. In addition, stress related trauma has been associated with parents' perception that their infants' NICU admission is a disruption to their anticipated norm and contributes to feelings of on-going, enduring uncertainty as well as a lack of agency in their parenting role (Lasiuk, Comeau, & Newburn-Cook, 2013). Melnyk, Feinstein, Alpert-Gellis, Fairbanks, Crean, Sinkin, Stone, Small, Tu & Gross (2005) believe that for NICU parents, long-term poor parenting outcomes are to a significant extent due to negative parent-child interaction trajectories that begin in the NICU. Stress, feelings of helplessness, absence of parenting knowledge, and negative child-interactions

contribute to misperceptions about the infant, resulting in difficult parent-child interactions (Melnyk et al., 2005).

The “emotional roller-coaster” known as the NICU can diminish the development and application of parenting skills, providing another psychosocial challenge. Jotzo & Poets (2005) believe that the emotional impairments of NICU parents have long-term, adverse impact on parental self-confidence and parenting. NICU parents have increased symptoms of intrusion and avoidance and higher risk of post-traumatic stress disorder (PTSD) resulting from untreated stress. NICU parents have increased psychological stress and this stress can endure well after discharge (Jotzo & Poets, 2005).

Hodgkinson, Beers, Southammakosane, and Lewin (2014) report that mothers who have infants in the NICU, are at significant risk for developing post-partum depression (PPD). There is a correlation between maternal depression and attachment, with maternal depression being associated with diminished parenting skills and later behavioral difficulties in children.

Bergstrom, Wallin, Thomson, & Flacking (2012) found that some mothers in the NICU can experience PPD for up to 4 months post discharge. In their study, single mothers were at higher risk for experiencing PPD at 4 months, mothers with a history of depression had an increased risk of experiencing PPD at 1 month post discharge, and mothers who felt depressed during the pregnancy experienced PPD at 1 and 4 months post discharge. Depression is associated with a two to three fold risk of committing physical abuse, psychological aggression, and medical neglect (Conron, Beardslee, Koenen, Buka & Gortmaker, 2009).

The inability of NICU parents to adapt and cope with their NICU graduates can pose child maltreatment risks for NICU infants. Nandyal et al., (2013) conducted a study looking at caregiver burden as a risk factor for child maltreatment of NICU children. In their study, they

identified a correlation between caregiver burden and increased child welfare reports, with higher caregiver burden increasing risks for received child welfare reports. The study found that out of 2,463 NICU graduates, 523 (21%) received at least one report for child maltreatment between 2-6 years post discharged (median 3.2 years). Nandyal et al., 2013 observed a pattern of abuse, with children being at particularly high risk during the first year of life, and the first month of life being the highest child maltreatment reporting period.

Attachment

Bowlby's attachment theory espouses that organisms have attachment systems (Berzoff, Flanagan, & Hertz, 2011; Bowlby, 1970). Attachment systems usually develop between 6-12 months (Berzoff et al., 2011). These attachment systems are adaptable and serve to protect young species by keeping them in close vicinity to older animals (Berzoff et al., 2011; Bowlby, 1970;). Attachment systems are defined as infant movement toward or in proximity of a mother or primary caregiver with the goal of exploration and security (Berzoff et al., 2011). Infants who are securely attached use an attachment figure as a kind of safe base and in time develop a representational model of attachment figures that are available, responsive, and can be counted upon (Bowlby, 1970; Bowlby, 1988). In addition, Ainsworth and Bell (1970) identified two categories of insecure attachment: insecure avoidant and insecure ambivalent/resistant. The insecure avoidant infant is often exposed to a caregiver who is rejecting, unavailable, or unresponsive to the infant's needs. In turn, the insecure avoidant infant develops a physical and emotional pseudo-independence, does not seek contact with and comfort from the caregiver when distressed, is unable to depend on the caregiver to be there when needed, and consequently has difficulty separating from the caregiver and being soothed upon reunion after a separation. Main and Solomon (1986) identified a third type of insecure attachment: disorganized

attachment. Children exhibiting disorganized attachment demonstrate a mixture of avoidant and resistant behavior with regard to their caregivers, often appeared dazed and confused. The behavior of caregivers with disorganized attached children is erratic and unpredictable, and it has been speculated that these caregivers may have themselves suffered from significant maltreatment as children.

In utilizing Mary Ainsworth's Strange Situation, a clinical classification assessment, to observe attachment relationships between caregivers and children, Mehler, Wendrich, Kissgen, Roth, Oberthuer, Pillekamp, & Kribs, (2011) concluded that infants who are able to see their mothers within three hours after birth are significantly more likely to develop a secure attachment pattern at 12-18 months of life. The rapid development of the brain, directly related to attachment, makes the first year of life crucial for developing attachment bonds between caregiver and infant (Humphreys & Kiraly, 2011). At birth, the preterm infant's (or the infant with special health care needs) environment is the NICU. An infant can remain in the NICU for several weeks and even up to several months. Based on the duration of a NICU admission, it is the ideal time to foster, nurture and develop the mother-infant bond to promote secure attachments.

In instances where NICU parents have trauma histories, fostering attachment is especially crucial to preventing child maltreatment post discharge, yet because of their own disrupted attachments, these parents often struggle with forming secure attachments with their infants. There is a connection between trauma, neurodevelopment and psychiatric disorders. Lanius, Bluhm, & Frewen (2012) identify adults with childhood abuse histories, as having an increased risk of psychiatric disorders. Adult childhood trauma survivors may develop a learned helplessness due to their past inability to remove themselves from harm (Lanius et al., 2012).

Furthermore, women with PTSD expressed more negative thoughts and self-hatred than women without PTSD (Lanius et al., 2012). It should be noted that the NICU setting can disrupt attachment in the infant-caregiver dyad (Lasiuk, Comeau, & Newburn-Cook, 2013) and provide yet another source of trauma to parents who have already experienced significant trauma.

There is an association between the absence of a secure attachment, neglect, and abuse. Crittenden & Ainsworth (1989) posit that parental behavior and child-coping strategies are respectively different in circumstances of neglect versus abuse. Children who were neglected are considered to have either extreme passivity, often characterized as withdrawal, or undisciplined activity characterized by disorganized and aggressive interactions (Crittenden & Ainsworth, 1989). In considering children who were abused, they are categorized as avoidant, aggressive with peers, resistant, or even compliant if they are able to comply with their mothers' desires (Crittenden & Ainsworth, 1989). Parents who neglect their children are believed to be unresponsive to their children's needs and unable to foster secure attachments, and parents who abuse, are frequently frustrated by their inability to perceive and respond appropriately to their children, and as a result often avoid and/or punish their children, increasing their children's level of stress (Crittenden & Ainsworth, 1989). This behavior is especially dangerous for infants – and most particularly to NICU infants and graduates – who have needs which they are unable to express.

A study conducted by Cicchetti, Rogosch, & Toth (2006), showed that mothers in a maltreatment group demonstrated a reduced ability to develop secure attachments with their children, and linked this reduced ability to each mother's own experience of abuse and neglect in childhood. The mothers in the maltreatment group also reported fewer available social supports from family, which may be related to earlier difficulties with relationships (Cicchetti et al.,

2006). The maltreatment group reported more stress, demands and struggles in relation to their infants and expressed feelings of incompetency. In addition, the mothers in this group demonstrated impairments in comprehension of appropriate parenting attitudes and behaviors and were rated as having lower sensitivity to their infants, particularly when compared to the non-maltreatment group (Cicchetti, et al., 2006). It is critical to note that 90% of the infants of mothers in this maltreatment group were classified as presenting with disorganized attachment compared to only 42% of infants in non-maltreatment families (Cicchetti et al., 2006).

Alexander (2013) identifies maternal history of trauma and loss, helpless, and aggressive parenting as risk factors for child maltreatment. She suggests that the insecure attachment (avoidant-anxious-ambivalent-disorganized) of mothers stems from their childhood experiences and evolves into their becoming dismissive or preoccupied adults. The disorganized mother is fearful and this fear reduces her ability to be attuned and protect her child. A mother's misattunement to her infant (i.e. inappropriate responses and contradicting communications) can result in insecure attachment, and mothers who do not appropriately attune to their infants offer reduced emotional protection to their infants, which can contribute to subsequent trauma for the infant (Alexander, 2013). Alexander (2013) asserts that fearful caregivers become unable to properly conduct their parenting duties because of their own unresolved trauma and loss, and this can also predict their children's insecure attachment. Furthermore, maternal traumatic experiences can serve as antecedents for insecure attachment and multiple risk environments (past and current) can contribute to the development of insecure attachment (Alexander, 2013). Mothers in a NICU setting may present with unresolved childhood trauma histories which can contribute to insecure attachments. In addition, the loss and fear which results from the NICU course itself may lead to misattunement and decreased overall protection for NICU infants.

NICU Attachment and the Provision of Human Milk

The NICU setting can disrupt attachments in the mother-infant dyad (Lasiuk, et al., 2013). Breastfeeding and the provision of human milk is a skill that may foster attachment and mitigate the disruption in attachment caused by the NICU environment. The attachment system is used to develop and inform ontogenetic, physiological and psychological tasks for the mother-infant dyad (Fonagy, 2001). Therefore, the interface between the parent and infant informs the responding regulatory system providing a biological aspect to the mother-infant dyad (Fonagy, 2001). Breastfeeding and the provision of human milk is a biological skill that develops from mother-infant interaction which in turn influences the dyadic regulatory system and can inform the attachment process. Breastfeeding and human milk provision can serve to promote the regulatory system and improve mother-infant attachment.

Parents must learn to parent by providing optimal nutrition to a medically compromised infant in a stressful environment. In some cases, mothers must physically and mentally recover in the post-partum period and simultaneously adjust to the NICU admission in order to successfully provide her own breastmilk to infant (Hurst, Engebreston, & Mahoney, 2013; Parker, Burnham, Cook, Sanchez, Philipp, & Merewood, 2013). Breastfeeding and the provision of human milk in the NICU can serve to simulate an in-vivo situation in which mothers are required to cope with high levels of stress while developing parenting skills.

Attachment styles may provide insight into understanding women who decide to initiate breastfeeding. Scharfe (2012) discovered that women who initiate breastfeeding are more likely to have an attachment-approach orientation and those who do not breastfeed are more likely to have an attachment-avoidance orientation. Women with approach-orientations are more likely to continue breastfeeding when encountering difficulties, unlike women with avoidance-

orientations who, if they initiate breastfeeding at all, are likely to discontinue breastfeeding in the face of obstacles (Scharfe, 2012). Additionally, Scharfe (2012) found that women with both attachment orientations equally cited breast feeding challenges (i.e. latching, demanding infant, work, personal health issues). This research suggests an association between breastfeeding and attachment styles. Breastfeeding and the provision of human milk may influence attachment (or vice-versa) and breastfeeding/human milk provision may provide insight into the regulatory process that informs mother-infant interaction.

Scharfe (2012) states that women who have an approach-orientation are more likely to continue with a care-giving task (breastfeeding) while coping with interpersonal challenges (demanding infant), environmental challenges (work), and medical challenges (latching, personal health issues). In addition, maternal attachment styles may help predict mothers who are more likely to continue care-giving tasks post discharge while coping with similar challenges. It is possible that mothers with attachment-avoidance are more likely to discontinue care-giving tasks such as breastfeeding post discharge. Attachment styles may provide a measure for child maltreatment risk post NICU discharge and breastfeeding/provision of human milk can serve as a marker to assess attachment and care-giving ability in the NICU.

Breastfeeding as a Protective Factor for NICU Infants

There is an increasing awareness of the role of the health care provider in preventing child maltreatment (Brewer, Mitchell, & Tomlinson, 2012; Friedlander, et al., 2005; Friedman et al., 2012; Giardino, Hanson, Hill, & Leventhal, 2011; Hibbard & Desch, 2007; Thomas & Mott, 2013). As NICU graduates are at extremely high risk based on child maltreatment data (DHHS, 2012), it is important that health care providers understand that they can influence mother-infant attachment systems by motivating and encouraging interaction with their infant (Bader, 2012;

Gooding et al., 2011), encouraging a NICU environment of maternal inclusion and mother-infant centered care (Sheeran, Jones, Rowe, 2013), and practicing family centered care (Croft, 2012; Gooding, Cooper, Blaine, Franck, Howse & Berns, 2011). In improving attachment systems between mothers and infants, NICU providers may improve protection against child maltreatment.

As the health care community takes more responsibility for the identification of children in need of protection, particularly for infants under one-year of age, there becomes a need for the development of child maltreatment interventions at the medical provider level, and a need for specialized child welfare services to address the unique needs of special needs children. There is also a need to develop evidenced-based maltreatment prevention strategies for special needs NICU graduates. Breastfeeding and the provision of human milk can be considered a prevention for child maltreatment as it targets the most vulnerable child maltreatment group and can prevent future abuse for subsequent age groups. Breastfeeding and the use of mother's own milk is particularly useful for NICU infants as it may mitigate the risks of disrupted attachments which can influence negative parenting trajectories.

Breastfeeding and the use of mother's own milk provide NICU mothers with the opportunity to improve their mental health in stressful conditions and improve parenting skills. Mothers of infants who are in the NICU are at significant risk of developing post-partum depression (Hodgkinson, Beers, Southammakosane, & Lewin, 2014). Women who do not breastfeed, or wean from breastfeeding prematurely, have increased risk of postpartum depression and have an increased rate of abuse and neglect of their infant (AAP, 2012). Breastfeeding may reduce the risk of postpartum depression and improve infant wellbeing (AAP, 2012). Women who breastfeed have lower anxiety scores and improved confidence with

interpersonal relationships (Scharfe, 2012). Maternal depression has been associated with diminished parenting skills, difficult maternal-infant attachment and behavioral difficulties that develop during childhood (Hodgkinson et.al, 2014).

The provision of human milk may mitigate negative parenting trajectories. Breastfeeding and the provision of human milk for a preterm NICU infant is a complex parenting task. Preterm infants' are susceptibility to health issues, comorbidities (i.e. respiratory, infections, neurological impairments), and feeding aversions as a result of medical devices (Greene, O'Donnell, & Walshe, 2013). The NICU environment imposes conditions that challenge the ability of new mothers to initiate and sustain lactation progress. The presence of significant noise and stress (Callen & Pinelli, 2005) and absence of privacy in open bay wards make it difficult for mothers to bond with their infants and initiate feeding from the breast (Castrucci, Hoover, Lim, & Maus, 2007). Therefore, infant characteristics, clinical condition, and the NICU environment impede successful breastfeeding and the use of mother's own milk. In successfully meeting the challenges with human milk provision, parents find an ideal opportunity to improve adaptation and coping skills required for parenting.

In some cases, the combination of feeding challenges and psychosocial challenges in the NICU may contribute to a lack of compliance with the provision of human milk. There are lower breastfeeding initiation rates among mothers of preterm infants (Davanzo, Monasta, Ronfani, Brovedani, & Demarini, 2012; Maastrup, Bojesen, Kronborg, & Hallstrom, 2012) who must learn to facilitate lactation when their infants progress to more physiologically and medically stable levels (Callen & Pinelli, 2005; Maastrup, et al., 2012). Feeding and psychosocial challenges are not only limited to the NICU admission and low breastfeeding rates persist after discharge (Davanzo et al., 20012). Feeding and psychosocial challenges can

continue post-discharge making it even more important to successfully navigate these challenges prior to discharge in order to improve the outcomes for NICU graduates.

Breastfeeding and the provision of human milk have the potential to encourage and support the maternal role in the NICU. The provision of human milk is a care-giving task that may reduce the trauma induced stress caused by the NICU. In addition, the provision of human milk may decrease the stress associated with NICU infant's appearance by providing a mother with hope and encouragement that this care-giving task is benefitting her infant. Rossman, Kratovil, Greene, Engstrom, & Meier (2013) conducted a qualitative study to understand the healing effects of a maternal milk on very low birth weight and premature infants admitted to the NICU (Rossman et al., 2013). Mothers expressed increased motivation at seeing the result of weight gain and infant stability. The positive infant outcomes cited by mothers reinforced their maternal nurturing role, supported bonding, and helped the mothers themselves to heal from the trauma of delivery. The ritualistic routine of pumping milk, often necessary when an infant is in the NICU, served to maintain a biological connection, caretaking responsibility, and respite needs, and many mothers perceived pumping as reestablishing the prenatal connection that was lost due to the premature birth (Rossman et al., 2013). Mothers expressed reward in helping their infants grow and heal, and even those mothers who could not maintain sufficient milk volume continued pumping because they had faith that their infants were healing as a result of the milk they provided (Rossman et al., 2013).

The maternal role can be supported post-discharge from the NICU with the provision of human milk. Martino, Wagner, Froh, Hanlon & Spatz (2015) describe psychosocial parenting challenges women encounter post-discharge as women maintain demanding breastfeeding and human milk provision schedules while under stress, grappling with low milk supply, and

returning to work. Martino et al., (2015) describe that women can overcome the psychosocial parenting challenges of breastfeeding with appropriate NICU support. The Spatz Ten Steps for Promoting and Protecting Breastfeeding in Vulnerable Infants (Ten Steps), appropriate lactation support, services and equipment. The Spatz Ten Steps for Promoting and Protecting Breastfeeding for Vulnerable Infants (Ten Steps) are designed to support human milk provision for late-preterm infants (Spatz, 2004). These Ten Steps include 1) informed consent, 2) establishment and maintenance of milk supply, 3) breast milk management, 4) feeding of breast milk, 5) skin-to-skin care (SSC), 6) non-nutritive sucking at the breast, 7) transition to breast, 8) measuring milk transfer, 9) preparation for discharge, and appropriate follow-up (Spatz, 2004). Martino et al., (2015) cite positive outcomes related to Spatz Ten Steps and lactation support services provided to mothers prenatally and during the NICU course. Additionally, the Spatz Ten Steps for Promoting and Protecting Breastfeeding in Vulnerable Infants (Ten Steps) also significantly improved the number of mothers expressing their own milk 6 hours after delivery (Fugate, Hernandez, Ashmeade, Miladinovic, & Spatz, 2015). It may be that Spatz Ten Steps guidelines along with lactation support services yield positive successful parenting outcomes in the midst of psychosocial challenges because these methods help promote and enhance the mother-infant attachment.

The provision of human milk can be used by health care providers as a protective factor for child maltreatment. Breastfeeding and the provision of human milk provide an inclusive parenting method and incorporate mothers in the care of their infant. Breastfeeding and the provision of human milk is a care-giving skill that fosters maternal-infant attachment and specifically addresses the care-giving needs of infants. Breastfeeding and the provision of human milk provide parenting opportunity in addressing biopsychosocial challenges in the NICU

and post-discharge. Mothers can successfully overcome parenting challenges through the provision of their own milk.

Policies and Strategies for Implementing Breastfeeding as a Protective Factor

The climate for health care policy is ideal for supporting breastfeeding as a method to prevent maltreatment. The AAP (2012) released a statement stressing the importance of pediatric intervention in breastfeeding. Spatz (2011) identifies the critical role of nursing in supporting the Surgeon General's Call to Action to Support Breastfeeding, a 20 item plan for lactation care, education, and support. In targeting specific recommendations to nurse leadership in the implementation of action steps, Spatz (2011) recommends:

1. - reinforcing breastfeeding decisions
2. -educating families about breastfeeding
3. -providing support resources while discouraging the introduction of infant formula
4. -fostering continuity of breastfeeding care
5. -translating evidence-based practices into care
6. -ensuring proper nurse training and resources
7. -advocating for breastfeeding research and employer-friendly breastfeeding practices

Additional policies and practices that support the provision of human milk are The 10 Steps to Successful Breastfeeding in the NICU (Hallowell & Spatz, 2012) and the Three Guiding Principles (Nyquist et al., 2013). The 10 Steps to Successful Breastfeeding in the NICU was developed to address discrepancies in breastfeeding initiation rates and duration between preterm and term infants (Hallowell & Spatz, 2012; Nyquist, et al., 2013). The expanded version for

The 10 Steps to Successful Breastfeeding in the NICU includes skin-to-skin (kangaroo care) contact after birth, and emphasizes knowledge of infant cues, reinforces early breastfeeding initiation and maintenance with focus on infant stability, introduces semi-demand feedings (as opposed to on demand feeding) for preterm infants as a transitional method, and permits bottle-feeding alternatives (i.e. pacifiers and nipple shields) when justified (Nyqvist, et al., 2013). The Three Guiding Principles for use in a NICU: 1) focus on each individual mother and her situation, 2) support of family-centered care within the environment, and 3) provide continuity of care prenatally, perinatally, and postnatally in addition to discharge care.

The Spatz Ten Step (Hallowell & Spatz, 2012; Spatz, 2004) addresses the gap in knowledge about challenges for NICU practitioners concerning the provision of human milk NICU to vulnerable infants. Nyqvist (2013) believes that delays in breastfeeding initiation often are due to NICU practitioners' lack of knowledge about preterm feeding competence. Practitioners are often restricting preterm infant feedings based on unsupported misinformation and this misinformation can impact the health of preterm infants and their mothers (Nyqvist et al., 2013).

NICU environments with policies and practices that support the provision of human milk have better outcomes. Hallowell, Spatz, Hanlon, Rogowski & Lake (2014) studied the frequency of breastfeeding support and its associations between practice environment, nurse characteristics (education, experience and specialty certification) and staffing. This study associates adequate nursing support with the frequency of breastfeeding support and concluded that bedside nurses provide breastfeeding 24-hours a day in lieu of lactation consultants whose round the clock services are scarce in NICUs. The Hallowell et al. (2014) study found that NICUs which have

better work environments and improved nurse-to-patient staffing ratios were associated with a higher proportion of infants who receive breastfeeding support.

NICU policies and practice should support efforts health care providers in promoting mother-infant attachment. NICU staff must emphasize the parental role in all aspects of clinical care in order and particularly the provision of human milk for mothers to develop the necessary skills to care for their infants not only in the hospital, but also post discharge. Attachment involves parental empathic attunement to their infant's needs and parents' capacity to mentalize through exercising compassion, understanding, warmth and sympathy in responding to their infants' needs (Berzoff, et al. 2011). Humans are not born with the capabilities of self-regulation; therefore, a dyadic system is required to regulate infant emotions with empathy, understanding, and responsiveness of the caregiver. Ultimately, the infant's ability to empathize is directly connected to the caregiver's ability to mentalize the child's needs (Fonagy, Gergely, Jurist, & Target, 2002).

NICU providers facilitate the necessary skills and techniques to create a clinical environment that supports brain development and aid the infant's brain wiring system (Bader, 2012). In this regard, Bader (2012) recommends proprioceptive input, positive touch and infant massage, and minimizing infant stress. A similar method for improving neurodevelopmental outcomes and reduce environment related stress is Auditory, Tactile, Visual, and Vestibular (ATVV) intervention (White-Traut, 2015). ATVV is a multisensory techniques that involves mother's voice, rocking, moderate touch/stroking, and maternal eye contact (White-Traut, 2015). There is extreme fear, trauma and stress associated with NICU parenting and medical providers are encouraged to motivate parents to touch their infants and educate parents about how interaction with their infants can impact the development of the infant brain. In addition, NICU

parents should also be taught how to read infant avoidance cues and appropriately respond (Bader, 2012). Bader (2012) sees the role of NICU providers as affecting the development of neural pathways of the newborn infant and identifies this role of NICU providers as more than just life-saving; as NICU providers encourage positive touch, infant massage, and stress minimization, they are also fostering attachment bonds which ultimately may serve to be protective and life-sustaining post-discharge from the NICU.

Breastfeeding and the provision of human milk is an ideal method to contribute to the development of the infant brain through interaction (and nutrition); in addition, it is also important to educate parents about reading infant cues and responding appropriately to those cues. NICU providers partner with mothers to encourage breastfeeding and the use of mother's own milk to support the care-giving needs of their infants. In partnering with mothers, NICU providers may also be increasing safety against maltreatment post-discharge.

NICU Breastfeeding Implications & Social Work

Breastfeeding and the provision of human milk, as a protective factor against child maltreatment of NICU graduates, has particular implications for social work. The Department of Health and Human Services (DHHS) (2012) encourages states, organizations and programs to develop child maltreatment intervention and prevention programs. The Child Abuse Prevention and Treatment Act (CAPTA), originally passed in 1974 and most recently amended in 2010, and the Child and Family Services Improvement and Innovation Act, passed in 2011, focus on prevention, assessment, investigation, prosecution, and treatment activities (DHHS, 2012). The Community Based Child Abuse Prevention (CBCAP) program, supported by CAPTA, was established in 1996 and reauthorized in 2010, to support community-based efforts to develop, operate, expand, enhance, and coordinate initiatives, programs, and activities to prevent child

abuse and neglect. In addition, this program supports the coordination of resources and activities to better strengthen and support families to reduce the likelihood of child abuse and neglect, and fosters understanding, appreciation and knowledge of diverse populations in order to effectively prevent and treat child abuse and neglect (DHHS, 2012). Social workers are involved in all aspects of child maltreatment prevention and intervention programs, using their clinical skills to assess, investigate, and provide treatment to child maltreatment victims and perpetrators. In addition, social workers are trained in delivering culturally competent interventions which include resource coordination and strengthening and supporting families. Social workers play a pivotal role in reducing the likelihood of child abuse and neglect and are well positioned to address child maltreatment prevention in within the context of NICU settings and during the post-discharge period.

Currently, social workers have strong involvement in existing child maltreatment prevention and intervention services. Mikton & Butchart (2009) identify home visiting, parenting education, abusive head trauma education, and multi-component programs as child maltreatment interventions demonstrating the most promise. Sweet & Applebaum (2004) analyzed home visiting programs and concluded that home-visiting programs benefited both parents and children with a health and safety. Parents improved their attitudes and behavior regarding parenting, while children improved around cognitive and socio-emotional outcomes (Sweet & Applebaum, 2004). In addition they noted that potential abuse was lower for children receiving home-visiting services. Home visiting support programs are considered the most promising child maltreatment interventions (Olds, 2007). These programs are believed to be especially effective when they focus interventions on high risk-families and initiate services in the prenatal and perinatal periods (Olds, 2007).

Other child maltreatment prevention and intervention programs with strong social work involvement include 1) early intervention programs, 2) respite care, and 3) therapy programs such as PCIT (Parent-child interaction therapy). First, early prevention programs provide a significant decrease in acts of abuse and neglect, and result in risk reduction in areas of child functioning, parent-child interaction, and parent/family function (Geeraert, Van den Noortgate, Grietens, & Onghena, 2004). Second, respite care is a suitable and useful intervention to decrease stress in the mother-infant dyad and reduce dysfunctional parenting (Cowen and Reed, 2002). Lastly, PCIT demonstrates favorable results for child maltreatment intervention for former abusers (Chaffin, Silovsky, Funderbunk, Valle, Brestan, Balachova, Jackson, Lensgraf, & Bonner, 2004). The overall importance of PCIT intervention is its use of coaching parents in necessary parenting skills and exercising these skills in dyadic parent-child sessions (Chaffin et al., 2004). Even though these interventions involve a strong social work presence, they do not target the high risk NICU graduate population and/or focus on improving the dyadic attachment system disrupted by the NICU course.

Talk-therapy and motivational interviewing require more exploration in terms of its efficacy with addressing child maltreatment outcomes; however, many social workers are involved in offering treatment services utilizing these intervention practice models. Holman (2011) believes that talk-therapy is a promising intervention that provides ego-support to abusive parents. This method involves therapeutic talk treatment and strengthening the ego through the explicit verbalizing of aggressive fantasies (Holman, 2011). Forrester, Westlake, and Glynn (2012) endorse motivational interviewing for its utility in providing child welfare services. Practitioners employ skills that foster an environment for “change talk” which elicits a commitment to behavioral changes (Forrester et al., 2012). The attributes of motivational

interviewing are listening skills, conveying empathy, positive non-verbal communication, open-ended questions, and reflective statements (Forrester et al., 2012). Talk-therapy is another intervention provided by social workers, however, this intervention is not meant to prevent abuse from initially occurring and it does not support the dyadic attachment system.

The most often discussed social work intervention in child maltreatment is the actual physical removal of a child from parental care. Ainsworth & Hansen (2012) argue that this method of intervention poses a paradox for child welfare workers. They point out that in cases of abuse, the parents have human rights and children have legal rights; however in cases of removal, Ainsworth & Hansen (2012) contend the child's rights are upheld at the expense of the parent's rights. They assert that often times, child welfare workers neglect acknowledging the harm and trauma imposed on both child and parents due to the child's removal from the home. There is also questionable evidence that removal is actually in the best interest of the child, based on outcome studies of children in foster care (Ainsworth & Hansen, 2012).

Social worker involvement in child maltreatment prevention and interventions programs reinforces the crucial role of social work in addressing child maltreatment. There are emerging opportunities for social workers to transfer their clinical skills to address child maltreatment in health care settings as child maltreatment interventions trend into medical settings. Medical providers are being screened and trained on their knowledge of child maltreatment (Brewer, Mitchell, & Tomlinson, 2012), child maltreatment screens are being used in adult emergency rooms to identify abuse perpetrators (Diderich, Fekkes, Verkerk, Pannebakker, Velderman, Sorensen, Baeten, & Oudesluys-Murphy, 2013), and pediatric offices are emerging service points for child maltreatment prevention (Chavis, Hadnut-Beumler, Webb, Neely, Bickman, Dietrich, & Scholer, 2013). Social workers are represented in health care settings particularly in hospitals,

pediatric offices, and outpatient/inpatient specialty units. Social workers are at the forefront of child maltreatment prevention and intervention programs and must continue to play key roles in child maltreatment prevention and intervention services in the context of health care settings.

The NICU is a health care setting that provides social workers with a unique and valuable role for child maltreatment prevention and intervention services. Infants have higher victimization rates and more likely to die from child maltreatment than older children (DHHS, 2012; Finkelhor & Jones, 2006; Friedlander et al., 2005; Friedman et al., 2012; Gilbert et al., 2009). The NICU setting itself disrupts parental attachment (Lasiuk, et al., 2013). In the NICU parents must provide care under stress (Tandberg, Sandtro, Vardal, & Ronnestad, 2013), address risks related to postpartum depression (Hodgkinson, Beers, Southammakosane, & Lewin, 2014), cope with the “emotional rollercoaster” that can diminish parenting skills (Jotzo & Poets, 2005) and address the burdens of caring for a NICU infant, which poses its own child maltreatment risks (Nandyal et al., 2013). The NICU social worker can address an extremely vulnerable child maltreatment group, remove challenges to parental attachment and bonding, and address psychosocial issues related mental health support, family support, and resources to address the care burden needs of NICU families while infants are in the NICU and during the post-discharge period.

In addressing child maltreatment, attachment theory is particularly useful to NICU social workers. Bowlby’s attachment theory informs us that mother-infant attachment systems are adaptable tools that can serve as protection for the infant by keeping him/her in close proximity (Berzoff et al., 2011; Bowlby, 1970). Social workers can help strengthen mother-infant attachment systems to adapt to NICU environments. Conceptually, the mother-infant attachment system can be used as a tool to protect NICU infants. In fostering secure attachment social

workers are providing opportunities for parents to learn how to provide appropriate care to their NICU infant. Berzoff et al., (2011) describes attachment as a parent's capacity to mentalize through exercising compassion, understanding, warmth and sympathy to the infant's needs. Secure attachment can be encouraged by social workers supporting a mother's role in providing care to her infant and encouraging maternal involvement in all aspects of infant care in the NICU. Specifically, social workers can encourage and facilitate frequent and regular maternal visits by helping to remove barriers to visitation and bonding, critically reviewing and challenging NICU policies that potentially disrupt secure attachment, and introduce/support policies and practices that are conducive to secure attachment.

A valuable role for social workers in preventing child maltreatment of NICU graduates may include the encouragement and support of breastfeeding and human milk provision. Traditionally, lactation consultants and bedside nurses are charged with facilitating and supporting human milk provision efforts. Nursing-led lactation support makes sense as the AAP recommends and reaffirms exclusive breastfeeding for the first 6 months of an infant's life and continued breastfeeding with food from 6-12 months (AAP, 2012; Castrucci et al., 2007; Colaizy & Morriss, 2008; Spatz, 2006). In addition, human milk is considered the best nutrition option for NICU infants (Parker et al., 2013). However, as the provision of human milk can promote the attachment systems increasing protection for NICU graduates, nursing-led support of breastfeeding and human milk provision should not preclude the importance of social work involvement. In fact, there are strong implications for a nurse-social work partnership to improve outcomes for NICU graduates.

In addition to addressing environmental influences that lead to disrupted attachment, NICU social workers can also address psychological barriers to disrupted attachment. Social

workers can assess maternal histories of psychiatric disorders and trauma, particularly those related to childhood abuse (Lanius et al., 2012) in order to connect mothers to appropriate mental health support early and through the duration of the NICU course. Mothers should be encouraged to continue mental health support post discharge as mental health concerns can extend well beyond discharge from the NICU (Bergstrom, Wallin, Thomson, & Flacking, 2012). Social workers can conduct screens for depression/postpartum depression for NICU mothers and address factors that lead to or exacerbate maternal stress during the NICU course. Mental health support can contribute to the removal of attachment barriers for the mother-infant dyad. Mothers receiving mental health support to address issues such as depression/post-partum depression may be more likely to breastfeed their NICU infant once their symptoms improve or subside. Similarly, mothers with histories of childhood trauma and loss that can compromise their ability to conduct parenting duties (Alexander, 2013) may also benefit from mental health support to improve the dyadic attachment system.

Breastfeeding and the provision of human milk as a protective factor for child maltreatment provide additional opportunities for social workers to keep NICU children safe at home following their discharge. The use of mother's own milk as a caregiving task supports mother-infant attachment and may offer both safety benefits and medical benefits to NICU graduates. Social workers have a role in championing human milk provision initiatives, policies and practices, and need to partner with nursing and lactation consultants to remove barriers to breastfeeding and ultimately mother-infant attachment. Evidence-based research is required to explore breastfeeding as a protective factor for child maltreatment of NICU graduates.

Research Implications

There are no known research studies exploring the connection between breastfeeding and child maltreatment of NICU graduates. Strathearn, Mamun, Najman, & O'Callaghan (2009) conducted a 15-year Australian study to determine if breastfeeding served as a protective factor for maternally-perpetrated child maltreatment of healthy newborns. This study showed that of the total number (512) of children included in the study who had substantiated child abuse reports, more than half (60%) experienced at least one or more incident of maternal-perpetrated abuse or neglect. There is an inverse relationship that showed increased maternal maltreatment and decreased breastfeeding duration, determined by an odds ratio (Strathearn et al., 2009). The odds of maternal maltreatment in non-breastfeeding children are 4.8 times the odds of children breastfed for 4 or more months. The odds for non-breastfed children decreased to 2.6 times higher when adjusted for confounding variables such as cigarette use, binge drinking, anxiety, and attitudes about pregnancy. Maternal neglect was independently associated with breastfeeding duration and increased four-fold for non-breastfed children compared to those breastfed for four months or greater (Strathearn et al., 2009).

The Strathearn et al., (2009) study demonstrates an association between child maltreatment and mothers who do not breastfeed. In addition, Strathearn et al., (2009) suggest that breastfeeding duration may positively impact maternal neglect. The implication for this study is significant, particularly when considering the NICU population. This study may suggest that social workers have a stronger role to play in breastfeeding support specifically in NICU settings.

There is little research specifically focusing on disrupted attachment and maltreatment of NICU infants and graduates. More research is needed to examine child maltreatment

intervention strategies that emphasize attachment bonds for mothers and NICU infants. Overall, the literature does not identify specific, evidenced-based interventions directed toward special needs NICU children with the primary focus to reduce child maltreatment of NICU graduates by improving mother-infant interactions that promote secure attachments.

While the literature addresses maternal attachment styles and breastfeeding/human milk provision, there is scarce literature on the use of human milk as an intervention or prevention for child maltreatment, particularly for NICU graduates. A limitation in the majority of the child maltreatment research is the singular emphasis on the mother as the unit of intervention and support. The conceptual framework and theoretical grounding for interventions need to be inclusive of the mother-infant dyad. In order to achieve optimal, successful child maltreatment interventions, the mother and child must mutually benefit. Interventions need to promote bonding and attachment, and nurture physiological needs, while offering beneficial health outcomes for the infant, and enhancing mental health outcomes for the parent. In pursuit of these intervention aims, attachment theory provides a comprehensive conceptualization of the mother-infant relationship and directly addresses the unique experiences of special needs NICU infants.

Conclusion

Social workers are at the forefront of child maltreatment prevention, assessment, investigations, treatment and programs. As child maltreatment prevention and intervention activities begin to emerge in health care settings, social workers must continue to use their skills to refine and craft programs and services. NICU graduates are represented in the highest child maltreatment group and their special health care needs increase their vulnerability and risk of child maltreatment. Breastfeeding and the provision of human milk provides an opportunity within the context of multiple psychosocial challenges presented in the NICU to address risk

factors for NICU infants and graduates by encouraging and supporting the maternal role. Breastfeeding and human milk provision is an attachment informed prevention that may help mitigate the disruption in attachment caused by a NICU course. More evidence is needed to inform attachment based interventions for NICU infants. Additional research is required to examine human milk provision as a protective factor against child maltreatment.

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