MATERNAL-INFANT SEPARATION DURING HOSPITALIZATION

AFTER BIRTH

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ABSTRACT

Purpose and Background: The purpose of this study was to examine mother-infant separation after birth as a means to understand the "rooming-in" practices at the study facility. Rooming-in is defined as care of the mother-infant dyad with minimal separation. To obtain a Baby Friendly Hospital Initiative designation, a birthing facility must provide "rooming-in" for all mother-infant dyads, unless separation is medically necessary.

Method: This descriptive study took place at a Midwest academic medical center. Mother-infant separation was recorded at the crib by care providers each time the infant arrived or left the mother's room. Data were entered into Excel and SPSS for analysis by the research team. Statistical analysis included mean time of separation, mean number of separations, and reason for mother-infant separation. In addition, differences between male and female mother-infant separations, as well as separation differences by ethnicity, were examined.

Results: A total of 403 births occurred during this study. The mean length of maternal-infant separation in minutes for September, October, and November was 56.90, 60.53, 57.47, respectively. The mean length of maternal-infant separation in minutes for September, October, and November did not differ significantly. Additionally, mean number of separations, which ranged from 0.72 to 1.12 for each month, was not significantly different. Additionally, mean number of separations was 0.7234, 0.9394, and 1.1170 per day for each month. The two most common reasons for separation were circumcision and maternal request. There were no statistically significant differences between male and female infants in mean length of separations or mean number of separations.

Conclusions and Implications: On average, maternal-infant dyads participating in this study experienced separation less than 60 minutes per day. Understanding the length of separations, and reasons for separation, between mothers and infants helps the hospital reduce separation. The results of this study are directing efforts for achieving Baby Friendly Hospital Initiative designation at the study facility.

INTRODUCTION

The purpose of this study was to analyze maternal-infant separation after birth in order to understand the "rooming-in" habits at the study facility. According to the *Guidelines and Evaluation Criteria for Facilities Seeking Baby-Friendly Designation* (2010), rooming-in is defined as care of the mother-infant dyad with separation less than one hour in a 24-hour period. The Baby Friendly Hospital Initiative designates hospitals and birthing centers maintaining excellent practices in breastfeeding and provision of an optimal mother-infant bonding environment. To obtain a Baby Friendly Hospital designation the birthing facility must practice "rooming-in" for all mother-infant dyads, unless separation is medically necessary.

According to Crenshaw (2004), childbirth transitioned from a home setting to a hospital setting in the early 20th century. Promptly following delivery, mothers were sent to hospital rooms, while newborns were kept in nurseries. Healthcare professionals believed maternal-infant separation provided mothers more uninterrupted sleep through the night (Crenshaw, 2004). Recent research shows "that mothers whose babies are cared for in the nursery do not get more sleep than other mothers who room-in with their babies at night" (Crenshaw, 2004, p. 37). Additionally, it was believed separation of the mother and newborn was best practice in order to limit germ exposure for the newborn (Crenshaw, 2004). Current research contradicts this theory. Crenshaw (2004) states "skin-to-skin contact provides an opportunity for a baby to be exposed to the normal bacteria on his mother's skin, and decreases the risk of the baby becoming sick due to harmful germs" (p. 36).

In addition to healthy bacterial exposure, limited separation beginning at birth is correlated with greater newborn thermoregulatory stability mainly due to an increased chance for skin-to-skin contact between mother and infant (Lawrence & Nolan, 2009). Infants with a decrease in temperature return to baseline more quickly when held skin-to-skin by their mothers (Charpak et al., 2005). According to Crenshaw (2014), early infant separation for bathing purposes raises the risk of neonatal hypothermia. Skin-to-skin contact reduces the risk of neonatal hypothermia because the mother's breast rises in temperature to promote adequate temperature in her newborn (Crenshaw, 2014). In addition to stable temperature control, skin-to-skin contact promotes better cardiorespiratory stability (Moore, Anderson, & Bergman, 2007). Immediately following delivery, babies held skin-to-skin are naturally inclined to breastfeed, and usually initiate breastfeeding within one hour (Crenshaw, 2007). Furthermore, this touch promotes a larger supply of breast milk, and longer duration of breastfeeding sessions (Crenshaw, 2007).

Takahashi et al. (2011) states skin-to-skin contact for 60 minutes or longer produced a significant drop in infant salivary cortisol levels, a hormone indicative of stress. Obtaining salivary cortisol lends an accurate, minimally invasive measurement of infant stress response to physical or environmental stimuli. The initiation of skin-to-skin contact directly after birth led to a decrease in infant stress levels and shorter lengths of crying time (Takahashi et al., 2011). Infants denied skin-to-skin contact immediately following delivery "have been shown to cry more than infants not separated. High salivary cortisol levels, a stress indicator, and increased respiratory and heart rates have been associated with crying" (Lawrence & Nolan, 2009, p. 431).

Among healthcare providers, breastfeeding exclusively has been viewed as the greatest method for preventing common causes of newborn illness. Research suggests breastfeeding exclusively for 6 months is one of the "most significant strategies to improve infant and child health and reduce childhood illness and mortality" (Crenshaw, 2014, p. 215). Breastfed infants demonstrated significantly decreased rates of lower respiratory tract infections, otitis media, diarrhea, Type 1 and Type 2 diabetes, childhood leukemia, necrotizing enterocolitis, and Sudden Infant Death Syndrome (*Guidelines and Evaluation Criteria for Facilities Seeking Baby-Friendly Designation*, 2010, p. 3). Breastfeeding mothers experience health benefits, as well. A "lower risk of Type 2 diabetes, breast, and ovarian cancer" as well as a "reduction in the risk for cardiovascular and other related diseases" is recorded among breastfeeding mothers (*Guidelines and Evaluation Criteria for Facilities Seeking Baby-Friendly Designation*, 2010, p. 3).

Additionally, maternal-infant benefits are enhanced through rooming-in practices. Rooming-in is defined as "allowing mothers and infants to remain together twenty-four hours a day" ("Guidelines and Evaluation Criteria for Facilities Seeking Baby-Friendly Designation", 2010, p. 16). Rooming-in provides the optimal environment for maternal-infant bonding through uninterrupted skin-to-skin contact and baby-led breastfeeding. Crenshaw (2014) states rooming-in increases the likelihood of breastfeeding exclusivity. Furthermore, rooming-in is associated with higher rates of breastfeeding exclusivity for longer durations of time after hospital discharge.

According to Forster and McLachlan (2007), rooming-in starting at birth is the optimal method for infant-led breastfeeding. Maternal-infant separation creates missed

opportunities for the mother to recognize infant feeding cues (Buchko, Gutshall, &

Maugans, 2013). Subsequently, this limits the ability for a nurse to promote the benefits of

breastfeeding and provide necessary breastfeeding education. Mothers that practice

rooming-in show a greater understanding of their babies' feeding cues and needs

(Crenshaw, 2007). This heightened understanding is correlated with "higher scores on

tests that measure the strength of a mother's attachment to her baby" (Crenshaw, 2007, p.

41). Frequent or continuous contact may have long lasting impacts on the maternal-infant

relationship, as well. According to Crenshaw (2007), lower rates of "child abuse, neglect,

and abandonment" (p. 41) are seen among mothers and infants who engaged in rooming-

in.

According to the *Guidelines and Evaluation Criteria for Facilities Seeking Baby-Friendly

Designation* (2010), the Baby Friendly Hospital Initiative (BFHI) recognizes hospitals and

birthing centers providing excellent aid in breastfeeding and maintaining optimal mother-

infant bonding. Attainment of Baby Friendly Hospital Initiative designation requires

rigorous participation of all stakeholders. Forster and McLachlan (2007) state

accreditation is achieved through 80% compliance with each of the "Ten Steps to

Successful Breastfeeding". These Ten Steps promote the best practices to ensure optimal

breastfeeding. Women who give birth in BFHI-recognized hospitals have seen an increased

rate in "positive breastfeeding outcomes" (Forster & McLachlan, 2007, p. 274).

Step 7 of the "Ten Steps to Successful Breastfeeding" requires the implementation of

rooming-in. The BFHI recognizes rooming-in should be practiced, regardless of feeding

method, unless separation is medically indicated (*Guidelines and Evaluation Criteria for*

Facilities Seeking Baby-Friendly Designation, 2010). Optimization of breastfeeding is encouraged through the implementation of BFHI recognition (Forster & McLachlan, 2007).

In summary, maternal-infant bonding and breastfeeding is promoted by rooming-in. It is the obligation of the healthcare professional to encourage and educate patients on best practices regarding maternal-infant bonding. In order to maintain a patient-centered focus, healthcare professionals must receive continuous education on best practices. Therefore, the purpose of this study was to examine and quantify current mother-infant separation habits at the study facility. Knowing the amount of time mothers and infants are separated, as well as the reasons for this separation will assist this hospital in reducing the amount of separation. Ultimately, the results of this study will support efforts for achieving Baby Friendly Hospital Initiative designation at the study facility.

THEORETICAL FRAMEWORK

Anderson's mother-infant mutual caregiving model (1977) was used to guide this study. This model posits that mother-infant interaction should be self-regulatory and uninterrupted directly after birth to encourage shared maternal-infant caregiving. This mutual caregiving model encourages infant-led breastfeeding and prompt skin-to-skin contact following delivery. Additionally, this model provides a way for mothers to know their infants, and develop positive bonding habits.

METHODS

STUDY DESIGN, SETTING, AND SAMPLE

This descriptive study took take place at a Midwest academic medical center, providing obstetric and neonatal care. The hospital facility is Magnet-designated and this study was embedded in the quality improvement process already underway in order to achieve BFHI designation at the study facility. Data collection occurred between September 1, 2015 and November 30, 2015. All births that occurred during the study period were included. Quality improvement designation was obtained from the Human Subjects Committee at the medical center.

INSTRUMENTS

Healthcare professionals recorded mother-infant separation each time the infant arrived or left the mother's room on the crib form sheet, an instrument developed by the "Rooming-In Team" of the breastfeeding taskforce at the study facility. Each infant had this form on their crib/bassinet for recording "check-out" time and reason for separation from mother. The form recorded "check-in" times when the infant was returned to the mother. Each of these forms was identified with a number that corresponded to the birth order for the month (hospital facility birth order). In addition, length of stay, feeding technique (breastfed or bottle-fed), newborn gender and ethnicity were documented. The research team also utilized the "Breastfeeding Exclusivity" report. This report included all babies that were discharged from the newborn nursery during the study period and their indicated method of feeding. Demographics included on the "Breastfeeding Exclusivity" report were gender of infant, length of hospitalization, and ethnicity.

DATA COLLECTION METHODS

Participants in the study were identified in order of birth for the month (1st birth = 1,

2nd birth = 2, etc.). This number matched the number provided on the crib form for each

infant. The same number assigned on the crib form matched the number on the

"Breastfeeding Exclusivity" report. These crib forms were collected for analysis monthly.

DATA ANALYSIS

Data were entered into Excel and SPSS for analysis by the research team. Descriptive

statistics were calculated and included mean total time of mother-infant separation, mean

number of separations, mean duration of separation, and reason for mother-infant

separation. Differences between male and female infant separations and differences

between ethnicities were examined using t-tests. Analysis of variance was used to analyze

mean differences across the three study months for mean number of separations, mean

duration of separation, and total time of mother-infant separation.

In order to standardize missing information, all of the identical reasons for separation

(e.g. circumcision) for that month were averaged. This mean number was used as a

replacement for the missing data.

RESULTS

A total of 403 mother-infant dyads were included in this study. There were 139, 124,

and 140 births for September, October, and November 2015, respectively (see Table 1).

Crib form completion steadily increased throughout the three months. September had the

lowest crib form completion rate with 59 (42%) total forms. October had 73 (59%) total

crib forms completed. November had the highest completed crib form rate with 97 (69%)

total crib forms. The mean length of hospital stay in hours for infants during September, October, and November were 48.6, 50.63, and 51.97, respectively. Cesarean section births had the longest length of stay for infants with a mean of 71.03 hours. Vaginally delivered births had a mean length of stay of 46.39 hours.

The mean length of maternal-infant separation in minutes was 56.90, 60.53, and 57.47 for September, October, and November, respectively (see Table 2). Table 2 also shows the average number of separations for each month of the study, which was 0.723 (September), 0.9394 (October), and 1.1170 (November). In September, the separations ranged from 0-3. The range for length of separation in minutes was 5-250 for the month of September. The number of separations in October ranged from 0-4, with the length of separation in minutes ranging from 6-380. The number of separations in November ranged from 0-5, with the length of separation in minutes ranging from 5-240. We found there was no statistically significant difference in mean length of separation between the three months ($p = .815$) and in total length of separation between the three months ($p = .331$). Furthermore, there was no statistically significant difference in the mean number of separations throughout the three months ($p = .075$).

Table 3 includes the most common reasons for separation of mothers and infants. The two most common reasons for separation in September, October, and November were circumcision and maternal request. During September, separation for circumcision occurred 13 (27.1%) times, and separation for maternal request occurred 12 (25.0%) times. Separation for circumcision occurred 23 (33.8%) times and separation for maternal request occurred 11 (16.2%) times during the month of October. In November, separation

for maternal request occurred most frequently at 38 times (34.9%). Separation for circumcisions during the month of November occurred 33 times (30.3%).

Table 4 reveals total length of separations for each month by infant gender. The mean total length of separation time in minutes in September for females was 40.18, while the mean total length of separation time in minutes for males was 47.45. In September, the mean length of each separation in minutes for females was 34.15 and 31.79 minutes for males. Additionally, the mean total length of separation in minutes in October in females and males was 43.96 and 56.81, respectively. In October, the mean length of each separation for males and females was 29.30 and 36.82, respectively. Mean total length of separation in minutes in November for females was 64.59, and for males was 62.44. The mean length of each separation in minutes in November for females and males was 34.68 and 38.83, respectively. Despite male separation for circumcision, there were no statistically significant differences between mean total length of time of separation (p = .738 for September, p = .429 for October, and p = .895 for November) and mean length of each separation (p = .875 for September, p = .438 for October, and p = .588 for November) between male and female infants.

Table 5 identifies length of maternal-infant separations by ethnicity. Mean total length of separation in minutes for September in Hispanic participants was 37.15. Non-Hispanic participant's mean total length of separation in minutes was 47.55. Mean total length of separation in minutes for October was 56.03 (Hispanic) and 50.01 (Non-Hispanic). Mean length of separation in minutes for November in Hispanic participants was 55.64, whereas non-Hispanic participants had a mean of 64.97. There were no statistically significant

differences in mean total length of separation (p = .659 for September, p = .732 for October, and p = .619 for November) or mean length of each separation (p = .704 for September, p = .964 for October, and p = .326 for November) between ethnicities.

LIMITATIONS

One significant limitation to our study was the lack of strict crib form compliance. When analyzing data, we found missing information in the check-out or check-in sections. In the future, strict compliance to completion of crib forms will help to promote a more accurate representation of the data.

Another limitation was the use of only one study facility. The concentration on a singular study facility was due to the efforts to achieve BFHI designation at this study facility. In the future, using a sample that includes multiple hospitals could positively benefit the research by providing a broader view of rooming-in practices, as well as a more diversified patient population.

DISCUSSION AND CONCLUSION

Of the 403 births that occurred at the study facility, only 229 (56.82%) total crib forms were collected. The percent of crib form completion steadily rose through the months of study participation. Low crib sheet adherence may be due to lack of proper participation education. The research team believes nurses became more accustomed to the crib form sheets as the months progressed, resulting in higher completion. We believe crib sheet completion rates would rise if the study were to be continued in the future for a longer duration of time.

On average, infants included in this study were separated from their mothers less than 60 minutes per day. These results are consistent with the views of best practice as defined by the *Guidelines and Evaluation Criteria for Facilities Seeking Baby-Friendly Designation* (2010). According to Baby-Friendly designation, separation less than 60 minutes in a 24-hour period is considered rooming-in. October showed the highest mean length of separation, just above 60 minutes. Although infants were separated less than one hour per day, the length of separations in minutes had a wide range due to maternal surgeries and car seat challenges.

Overall, circumcision was found to be the most common reason for separation for two of the three months. Maternal request was the second most common reason for separation. Crib form sheets contained many reasons for maternal request in the "comments" section. Reasons for maternal request included tubal ligation, leaving unit to smoke, showering, etc. Analyzing the crib form sheets showed some of the maternal request reasons for separation to be unnecessary. The research team believes staff and maternal education on the importance of rooming-in may have a significant impact on the reduction of unnecessary maternal-infant separations.

For future studies, the research team recommends researching maternal-infant separation time per nurse, although this could be difficult due to lack of confidentiality. Analyzing this information can help the research team to understand differences in individual nursing practice. Additionally, this can help the study facility further educate nurses on the benefits of rooming-in. The research team also recommends inquiry into reasons behind maternal request for separation. This is in an effort to reduce unnecessary

separation, and to encourage rooming-in when the situation arises. Finally, the research team recommends the implementation of a more efficient way of documenting maternal-infant separation. A more efficient documenting strategy may obtain higher completion of crib forms.

Understanding the reasons and amount of time for each separation of mothers and infants helps to assist the study facility in decreasing the amount of time of separation. The results of this study will help the study facility achieve Baby Friendly Hospital Initiative designation.

FUNDING

CONFLICT OF INTEREST

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APPENDIX A

Table 1

Number of Participants and Crib Form Information

	September	October	November
Number of Births	139	124	140
Number of Crib Forms Missing Identifiers	10	6	4
Number of Completed Crib Forms with All Identifiers	49	67	93
Percentage Completed	42%	59%	69%
Mean Length of Stay for Infants in Hours	48.6	50.63	51.97
Cesarean	65.68	75.65	71.76
Vaginal	44.5	45.52	49.15
Forceps-Assisted	61	n/a	n/a
Vacuum-Assisted	n/a	n/a	55

Table 2

Number and Length of Separations

Month	Number of Separations Range	Number of Separations Mean	Length of Separations Range (in minutes)	Length of Separations Mean (in minutes)
September	0-3	0.7234	5-250	56.90
October	0-4	.9394	6-380	60.53
November	0-5	1.1170	5-240	57.47

Table 3

Total Number of Separations per Reason by Month

	September	October	November
Car Seat Challenge	2 (4.2%)	6 (8.8%)	3 (2.8%)
Circumcision	13 (27.1%)	23 (33.8%)	33 (30.3%)
Imaging	5 (10.4%)	0 (N/A)	7 (6.4%)
Hearing Screen	3 (6.3%)	9 (13.2%)	4 (3.7%)
Lab Draw	5 (10.4%)	6 (8.8%)	16 (14.7%)
Maternal Request	12 (25.0%)	11 (16.2%)	38 (34.9%)

Table 4

Mean Total Length and Mean Length of Each Separation Based on Gender (Minutes)

	September	October	November
Mean Total Length of Separation Time			
Female	40.1850	43.9638	64.5909
Male	47.4536	56.8082	62.4388
Mean Length of Each Separation			
Female	34.1478	29.3019	34.6795
Male	31.7893	36.8245	38.8316

Table 5

Mean Total Length and Mean Length of Each Separation Based on Ethnicity (Minutes)

	September	October	November
Mean Total Length of Separation Time			
Hispanic	37.1538	56.0332	55.6364
Non-Hispanic	47.5464	50.0162	64.9653
Mean Length of Each Separation			
Hispanic	37.1538	33.5221	29.8636
Non-Hispanic	30.9624	33.9981	38.4951