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**Breastfeeding Rates in Marshallese Mothers:
A Needs Assessment**

A thesis submitted in partial fulfillment
of the requirements of Baccalaureate of Science in Nursing

by

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ABSTRACT

Background. Multiple health disparities are associated with the Marshallese population in Northwest Arkansas. Childhood obesity, linked to a decrease in exclusive breastfeeding, is one of the predominant issues. Since their migration to the United States, exclusive breastfeeding rates of Marshallese mothers have steadily declined throughout the years. Little research has been conducted to help combat this growing health disparity. Due to the increased growth in this population in Northwest Arkansas, it is imperative that measures are taken to decrease these disparities to improve the overall health of the future generations.

Objective: To determine the relationship between maternal age, parity, length of hospital stay, and intent to feed on the mother's breastfeeding patterns during hospitalization and the exclusive breastfeeding rate upon hospital discharge.

Methods: A retrospective data analysis of the rates of Marshallese mothers exclusively breastfeeding while in the hospital was analyzed to support a needs assessment for an in-hospital educational interventions. Data was collected through a medical records audit collecting information specific to breastfeeding rates of Marshallese mothers in 2014. Designated variables were assessed to provide frequency data, and compared to breastfeeding patterns to determine any significant relationships.

Results: Length of hospital stay was the only variable that proved to have significant effect on mother's breastfeeding pattern. An overall regression analysis proved that 74% of mothers moved toward the negative direction (formula feeding) during their hospital stay.

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Conclusion: The results from this study prove that the rate of exclusive breastfeeding amongst Marshallese mothers in the hospital is lower than desired levels. A culturally significant educational intervention is needed in order to increase these rates and improve the overall health of both the mother and baby. Further research is needed to discover the reasoning behind their feeding patterns and what further measures can be done to close this cultural gap.

BACKGROUND AND SIGNIFICANCE

The Marshallese population has greatly increased in the United States since the 1986 Compact of Free Association agreement (Choi, 2008). The compact allows Marshallese citizens to fluctuate in and out of the United States without a time constraint, they have specialized work authorization limits, and are offered various public benefits (Choi, 2008). From 1947 to 1986, the Marshall Islands were under the administrative control of the United States as part of the United States Nations Trust Territory (McElfish, Hallgren, & Yamada, 2015). During this time period, the U.S. military tested nuclear weapons on several Marshall Islands (McElfish, Hallgren, & Yamada, 2015). These nuclear bombs exposed Marshall Islanders to significant levels of radiation that lead to an array of ongoing ecological and health problems (McElfish, Hallgren, & Yamada, 2015).

The Marshallese Islands have a high poverty rate and overall inadequate public service infrastructure (Choi, 2008). A majority of the islanders have relocated to our nation in hopes for better education, economic opportunity, and medical treatment (Choi, 2008). While in the United States, the Marshallese pose a low standard of health and inadequate use of healthcare, which has presented to be a

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concern for the healthcare system (Choi, 2008). This situation is further complicated by Arkansas not offering Medicaid services or any alternative state-funded health insurance program to COFA migrants (McElfish, Hallgren, & Yamada, 2015).

However, Marshallese migrant children are covered under Children's Health Insurance Program (McElfish, Hallgren, & Yamada, 2015). The combination of two cultures of communicable and chronic diseases and migration related elements have intensified public health concerns and its negative impact on the health care systems (Choi, 2008).

Despite promotion and available health benefits, breastfeeding rates in Pacific islanders are below desired levels in the United States (Flood & Dodgson, 2010). From a worldwide perspective, around 800,000 children's death could be avoided if all women breast-fed their infants and children (Preidt, 2016). Studies on exclusive breastfeeding have found that exclusive breastfeeding can lead to a decrease in childhood obesity rates and provides protective mechanisms throughout childhood as well (Strong & Lee, 2014). Ethnic and socioeconomic studies prove that Hawaiian, Micronesian, and other Pacific Islander children had a higher likelihood of being overweight compared to Asian and White children (Anderson, Hayes, & Chock, 2013). Compared to White adolescents, 47.7% of Pacific Islanders adolescents are considered overweight or obese (Anderson, Hayes, & Chock, 2013). Breastfeeding also has the potential to prevent approximately half of all cases of diarrhea and a third of respiratory infections in at risk populations, such as low and middle income countries (Preidt, 2016). Studies on financial costs of childhood obesity show that an estimated \$14 billion dollars are spent annually

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towards childhood obesity medical care. (Strong & Lee, 2014). McCrory and Layte (2012) discovered that mothers had a 51% reduction risk for obesity if they breastfeed for 26 weeks or more.

It is unclear why Marshallese mothers have resorted to not exclusively breastfeeding. Acculturation to the American culture could play an important role. Previously, young women grew up with the support of family and community regarding breastfeeding by seeing their mothers and family members openly breastfeeding (Flood & Dodgson, 2010). Research demonstrates that support by peers has the greatest positive impact on breastfeeding rates (McInnes & Chambers, 2008). In this culture, the eldest female plays the predominant role in providing familial support to breastfeeding mothers (Scott, Shreve, Ayers, & McElfish, 2016). Perinatal characteristics from a study analyzing Hawai'i breastfeeding and childhood obesity revealed that less than 15% of mothers breastfed for six months or more (Anderson, Hayes, & Chock, 2013). This finding supports the potential assumption that social and cultural factors play a role in influencing behavior and environment, leading to increased childhood obesity (Anderson, Hayes, & Chock, 2013).

Regardless, it is the responsibility of health care providers to provide evidence-based knowledge, support, and encouragement to mothers regarding this decision to positively impact continued breastfeeding (Strong & Lee, 2014). A foundation of trust between mother and healthcare professional leads to positive outcomes in breastfeeding education (McInnes & Chambers, 2008). Flood and Dodgson (2010) conducted a study in which 34% of Pacific Islander mothers chose

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not to breastfeed due to unfamiliarity in the United States. These researchers found that cultural influences shaped their decisions, but that pamphlets or group classes did not prove to be effective promotion strategies (Flood & Dodgson, 2010). Their results indicate that promotion interventions should be culturally relevant to have an impact (Flood & Dodgson, 2010). Education provided to mothers should, therefore, be culturally sensitive in regard to communication. Breastfeeding education should be based off of the mother's knowledge and understanding, in the appropriate language, and presented in an open concept with a multitude of options. Instructions and information should not be given as hard and fast facts that the mother cannot understand (McInnes & Chambers, 2008).

Following a thorough search using a variety of databases no research was found examining breastfeeding rates in Marshallese Islander mothers in the hospital setting. Scott, Shreve, Ayers, & McElfish (2016) conducted a study outside of the hospital setting that analyzed the perception and beliefs behind why Marshallese women in Northwest Arkansas undergo certain breastfeeding practices. There are a multitude of barriers that influenced feeding decisions amongst these mothers. Public shaming, perceived milk production, and maternal employment proved to principal barriers (Scott, Shreve, Ayers, & McElfish, 2016). Due to economic reasons, Northwest Arkansas is home to the largest population of Marshallese Islanders in the contiguous US. It is important to understand the rate of exclusive breastfeeding in this population and design methods to encourage exclusive breastfeeding in this population. Therefore, the purpose of this study is to determine the exclusive breastfeeding rate prior to discharge among Marshallese mothers between the

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years 2012 and 2014 and to establish the need for further education. The study will answer the research question: What is the rate of exclusive breastfeeding in a hospital setting among Marshallese mothers?

METHODS

Overview

This study was conducted following approval from the University of Arkansas Institutional Review Board and the Northwest Arkansas hospital's Quality Improvement Department. The information technologist of the department and lactation consultant were utilized to further ensure proper competency of the collected data.

Design.

The design of this study is a descriptive needs assessment study using a retrospective data analysis of exclusive breastfeeding rates of Marshallese island mothers prior to discharge. This study was split into two separate components. The first aspect was an analysis of medical records determining exclusive breastfeeding rates in Marshallese mothers prior to discharge in a Northwest Arkansas hospital. This collected information served as a needs assessment for developing an educational intervention to encourage breastfeeding. The information collected contained the mother's age, number delivery of mother, method of delivery, gestational age, birth weight, intent to breastfeed, length of hospital stay, insurance stay, and feeding pattern during hospital stay. All of the information could be found in the mother's medical chart minus the feeding pattern during hospital stay. This information was obtained from the baby's medical chart. The mother and baby were

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matched for accuracy by comparing delivery date and delivery time. The mother's MSN number was found in the baby's chart as well. Feeding intention was found in the mother's chart, but the provided information was stated either at the time of admission, or at a previous prenatal appointment. The information obtained served as a reference to prove the need for the design of a breastfeeding teaching intervention specifically for Marshallese mothers.

Study Population

Participants included in this study were pregnant Marshallese mothers between the ages 18 and 45 delivering full-term infants. The aim of this study was to assess recent trends in feeding patterns, so mothers had to deliver between the years 2013 to 2015 to be considered relevant. Mothers younger than 18, babies delivered between 37 and 42 weeks, babies admitted to the NICU, babies with a cleft lip or palate or any other suspected genetic defects, and babies treated for hyperbilirubinemia were excluded in this study.

Study Procedures.

All patient information was coded and de-identified according to the Health Insurance Portability and Accountability Act (HIPPA) guidelines. A master list containing randomized chart number and patient's MSN number was kept in a secure location in the hospital to protect patient privacy. This list also served as a mechanism of avoiding repetition of charts collected. All medical chart reviews were conducted in the designated Northwest Arkansas hospital.

TIMELINE

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Needs assessment data collection began on September 14, 2015 and was completed on March 3, 2016.

STATISTICAL ANALYSIS

To measure the outcome, the valence of the direction of change from pre to post was used. How the valence was determined can be seen in Figure 1 below. Any change that moved or stayed in a positive direction (defined as breastfeeding only), was labeled positive change. Any change that moved or stayed in a negative direction (defined as moving away or remaining away from breastfeeding only), was labeled negative. So, for instance, if a mother indicated that she planned to breastfeed only but actually breastfed and used formula, this was considered a negative outcome. On the other hand, if a mother initially indicated that she planned to use formula but actually breastfed instead, this was considered a positive outcome. Likewise, if a mother initially indicated that she planned to use formula but breastfed and used formula, this as considered a positive change as well. Figure 1 below represents the outcome of the direction of change.

		pre-study planned behavior		
		breastfeeding	formula	both
post-study observed behavior	breastfeeding	positive	positive	positive
	formula	negative	negative	negative
	both	negative	positive	negative

Figure 1 Determination of or designation of the outcome was based on the intersection of the pre-study planned behavior and post-study observed behavior.

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Descriptive Statistics

Data collection began with a database search that resulted in 122 medical charts that met the eligibility criteria. Of those 122 charts, 100 charts were randomly chosen with a numeric randomizer to be included in the study. A univariate analysis was conducted to review the current trends of pregnant Marshallese mother's in the hospital. This descriptive data looked at the frequency of all of the independent variables used in the study such as: different biological ages, number of parity, length of hospital stay, and feeding intention prior to birth.

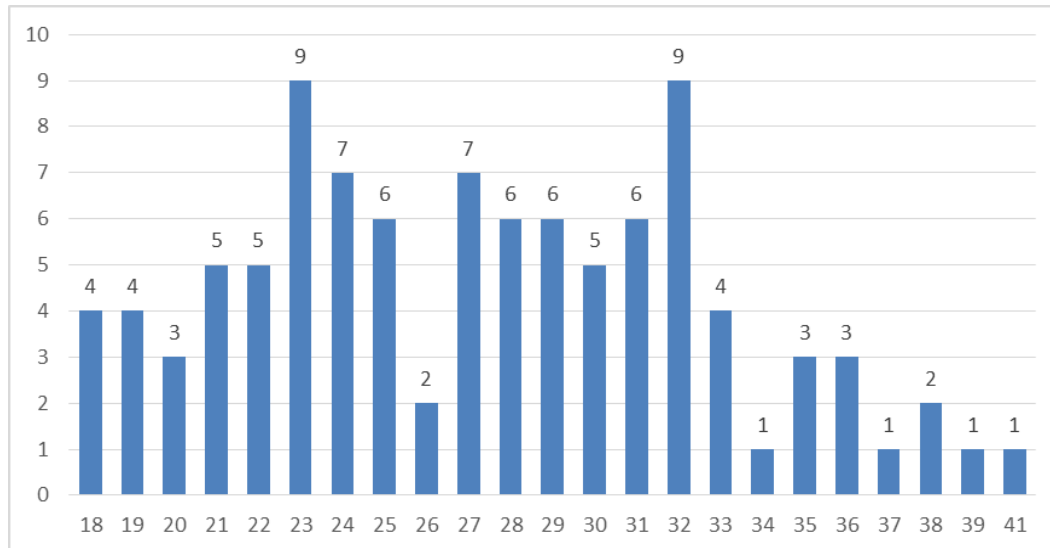


Figure 2. Frequency distribution of mother's age.

The range of age is quite large, from 18 to 41. However, the majority of mother's are between 23 and 32 years old. Because of the large range, age was separated into 3 categories to be used in a later comparison: 18-24, 25-31, and 32-41.

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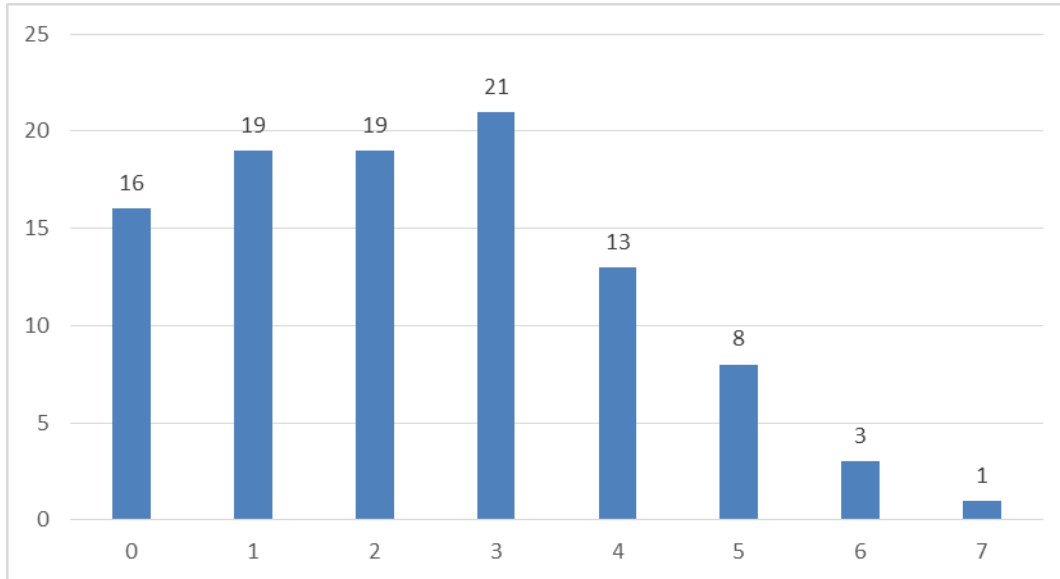


Figure 3. Frequency distribution of parity among mothers

The large majority (three-fourths) of all mothers in the sample had between 0 and 3 prior pregnancies. Less than five percent of mothers had 6 to 7 prior pregnancies.

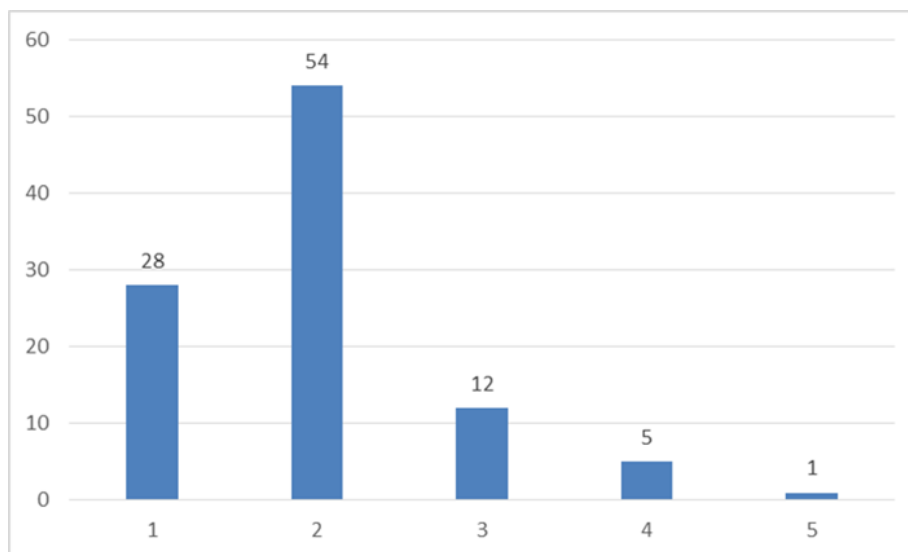


Figure 4. Number of days in hospital post-birth.

Number of days that the mother remains in the hospital may affect a mother's choice to breastfeed. It serves as a reference for knowing how long the hospital staff had on influencing feeding patterns. Approximately 8 out of every 10 mothers in the

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sample remained in the hospital for 1 to 2 days. Very few had a hospital stay for more than 3 days, with only one remaining for 5 days.

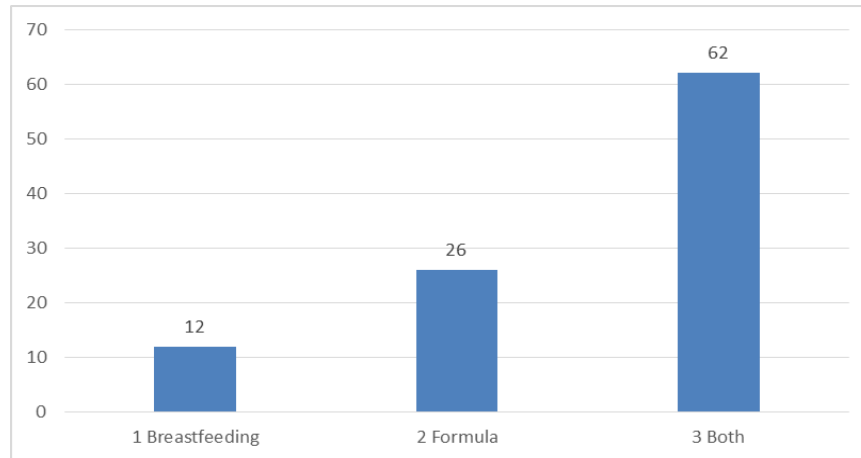


Figure 5. Mother's pre-birth stated feeding intentions

Two-thirds (62%) of mothers entered the hospital intending on using both breastfeeding and formula. The smallest proportion of the mothers, just over ten percent, initially planned on solely breastfeeding. Approximately one quarter of them planned on using only formula.

Results

Given that the level of measurement of all input as nominal, and the outcome variable was nominal, a series of Chi-Square Tests of Independence were conducted to answer a primary question in this study. 1. Is there a significant relationship between each of the independent variables and the dependent variable? 2. What is the nature of strength of this relationship? Alpha was set at .05 for all tests conducted.

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Table 1 Association Between Maternity Age and Breastfeeding Behavior

	18 to 24	25 to 31	32 to 41
Behavior	N(%)	N(%)	N(%)
Breastfeeding	11 (42.3)	10 (38.5)	5 (19.2)
Formula	9 (36.0)	11 (44.0)	5 (20.0)
Both	17 (34.7)	17 (34.7)	15 (30.6)

Mother's age

The mother's age was the first variable explored as a potential explanatory factor in breastfeeding behavior. The test for difference among age groups on the outcome was found to be non-significant, $\chi^2 (4, N = 100) = 1.87, p = 0.76$. The *Phi-Coefficient* (0.14) revealed a weak association. This means that the mother's age was statistically non-significant in affecting breastfeeding behavior. The weak association indicates that between the two variables, there is a small relationship amongst the two asides the statistical result.

Table 2 Association Between Parity and Breastfeeding Behavior

	0 to 2	3 to 4	5 to 7
Behavior	N(%)	N(%)	N(%)
Breastfeeding	16 (29.6)	7 (20.6)	3 (25.0)
Formula	12 (22.2)	11 (32.4)	2 (16.7)
Both	26 (48.2)	16 (47.1)	7 (58.3)

Parity

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The number of previous pregnancies was the second variable obtained to determine if there was an association between parity and breastfeeding. The test revealed no significant association $\chi^2(4, N = 100) = 2.14$. The *Phi-Coefficient* was found to be similar in strength as maternity age (0.15), showing a weak association between parity and breastfeeding. Both breastfeeding and formula feeding prove to be the common feeding pattern regardless of number of deliveries.

Table 3 Association Between Number of Days in Hospital and Breastfeeding Behavior

	1 Day	2 Days	3 or More Days
Behavior	N(%)	N(%)	N(%)
Breastfeeding	13 (46.4)	10 (18.52)	3 (16.67)
Formula	7 (25.0)	12 (22.2)	6 (33.3)
Both	8 (28.6)	32 (59.3)	9 (50.0)

Days in hospital

It was believed that number of days spent in the hospital might have an effect on the breastfeeding behavior of the mother. This suspected association was found to be significant, $\chi^2(4, N = 100) = 10.5, p < .05$. In addition, the *Phi-Coefficient* showed almost twice the strength of association than previous variables tested (0.32), designated as a moderate association.

Table 4 Difference Between Breastfeeding Intentions and Behavior

Behavior	Intent		
	Breastfeeding	Formula	Both
	N(%)	N(%)	N(%)
Breastfeeding	7(58.3)	1(3.9)	18(29.0)
Formula	0(0.0)	18(69.2)	7(11.3)
Both	5(41.7)	7(26.9)	37(59.7)

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Intentions

A fourth test was conducted to determine if there was a significant association between the initial feeding intentions prior to birth and the actual feeding behavior post-birth of the mothers. Reading Table 4 by column, it is clear that there are changes between intent and actual behavior. The overall differences were found to be significant, $\chi^2(4, N = 100) = 42.1, p < 0.01$. Note, because one of the cells had a count of less than 5, the Fisher's Exact Test was run along with the Chi-Square test. Given the magnitude of the differences, however, this made no difference in the p-value. Additionally, the Phi-Coefficient revealed a strong association between intent and behavior, (0.64).

A final test was conducted to determine if the general direction of change between intent and behavior was significant, i.e. whether positive vs. negative changes were different from another. Table 5 provides a clear answer to this question, as it pertains to the participants in the study.

Table 5 Difference Between Breastfeeding Intentions and Behavior

Variable	Positive (%)	Negative (%)
Observed Change	26.0	74.0
No Difference (Null)	50.0	50.0

Three-quarters of Marshallese mothers in the study had negative outcomes. Tested against a 50/50 split, or no difference, using the Chi-Square Goodness of Fit, there was a significant difference between the percentage of mothers who moved (or stayed) in the positive versus the negative direction, $\chi^2 = 23.0, p < 0.01$. This correlation proves that the mother's feeding patterns significantly moved to the negative direction (toward formula) during their hospital stay.

DISCUSSION

The aim of this study was to determine the rate of exclusive breastfeeding in Marshallese mothers. As the study evolved, the data presented itself in a descriptive manner of revealing any current trends the mothers presented with in the hospital. A large portion of the study analyzed current frequencies to provide percentages as a baseline for analyzing how these mothers presented in the hospital. These frequencies were individually compared to feeding patterns and trends to see if there was a significant relationship between the two. There was a weak association between mother's age and number of delivery to breastfeeding rate. Moderate association was found between length of hospital stay and breastfeeding rate. The rate of exclusive breastfeeding steadily decreased the longer the mother stayed in the hospital. Nevertheless, the rate of mothers breastfeeding and formula feeding increased the longer the hospital stay. Breastfeeding cessation can be contributed to a multitude of factors. Nipple soreness, inadequate milk supply, infant difficulties, and fear the infant wasn't satisfied are all documented reasoning why mother's cease breastfeeding (Ahluwalia, Morrow, & Hsia, 2005). The findings in this study contraindicate previous findings that found that women who intended to breastfeed were more likely to initiate breastfeeding and continue breastfeeding (Ahluwalia, Morrow, & Hsia, 2005).

Of the 100 mothers that were reviewed in this study, only 12 of them stated that they intended to exclusively breastfeed their baby. Of those 12, only 7 of them resulted in exclusively breastfeeding. This indicates that less than 10% of Marshallese mothers choose to exclusively breastfeed their baby. Not only did they

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choose not to exclusively breastfeed, statistics of this study show that 74% of mothers moved toward the negative direction (formula feeding) during their hospital stay. Only 39 of the 62 mothers that stated they intended to breast and formula feed actually did both. Seven of those mothers never breastfed and resulted in strictly formula feeding. This finding supports the low rates of breastfeeding that was previously found amongst this population group (Anderson, Hayes, & Chock, 2013). Therefore, the education, or lack thereof, that they are receiving in the hospital is not compatible with their cultural learning style.

Limitations

The majority of the data that was collected was retrieved from the mother's medical chart. Biological age, gestational age, number of delivery, method of delivery, baby's weight, length of hospital stay, intent to breastfeed, and insurance type were all collected from the same source. However, feeding pattern during hospital stay had to be collected in baby's medical chart. In doing this, it was discovered that length of hospital stay for mother and for baby were often times inconsistent. The hospital stay of the baby was limited to the amount of time spent in the nursery. If the baby was discharged before the mother, there was only recording of the baby's feeding during admission. This indicates that the mother's feeding during hospital stay could have deviated toward breastfeeding, but this was not recorded.

Adoption is another cultural choice that is common amongst this population group. When reviewing prenatal documents in the mother's chart, there was physical evidence that the mother plans to follow through with adoption after

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delivery. Research has been conducted on this cultural trend and studies have found that almost 25% of Marshallese children are raised by someone other than their biological parents (Joyce, 2015). Of these adoptions, a majority of them take place because an older relative has solicited the offspring of their younger kin (Joyce, 2015). This cultural trend greatly impacts feeding intention and behavior while in the hospital. A mother who plans to adopt may strictly formula feed without deviation due to their knowing that they will not be taking their baby home. The likelihood of these mothers benefiting from education or an intervention is very small. Sample population would have been a better representation if these mothers were not included.

The language and cultural barrier that existed between the mothers proved to be significant hindrance. In regards to assessing intent to breastfeed, a lot of mothers consider breastfeeding as “breastfeeding and formula.” They don’t look at it as an exclusive entity. That being said, the recorded intent to feed may not be an accurate documentation of what the mothers planned on doing during their hospital stay.

CONCLUSION

The results from this study show that Marshallese mother’s breastfeeding rates are going in the negative direction. Their intent to exclusively breastfeed coming into the hospital was only 12%. This finding is indicative that there is a gap in exclusive breastfeeding education prior to hospital admissions. However, the rate of exclusive breastfeeding while in the hospital was even lower. The education that is provided to the mother’s in the hospital is also ineffective in promoting exclusive

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breastfeeding. Increasing these breastfeeding rates is a crucial step in improving the overall health status of this population group. Further studies need to be conducted to determine why breastfeeding rates are so low. Discovering what factors influence learning patterns among this population would also be beneficial in knowing how to focus further education.

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