

FACILITATORS AND BARRIERS TO SUCCESSFUL BREASTFEEDING AMONG  
CHUUKESSE MOTHERS WHO HAVE MIGRATED TO GUAM

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## **Abstract**

### **Background/Significance**

Breastfeeding has long been known to positively influence infant health. Chuukese mothers traditionally breastfeed their babies, but little is known about breastfeeding among migrant Chuukese mothers. This study investigated the factors influencing breastfeeding behavior among Chuukese migrants living on Guam. As the first study of this type among Chuukese migrants, information was gained to allow policy development or revision to best support breastfeeding among this group.

### **Method**

This was a qualitative study, based on the theory of reasoned action, utilizing key informant and focus group interviews. Key informants (n=9) included three each from health care professionals, migrant Chuukese breastfeeding mothers, and migrant Chuukese formula/mix-feeding mothers. Focus groups (n=7) included migrant Chuukese breastfeeding mothers (n=8 mothers) and migrant Chuukese formula/mix-feeding mothers (n=10). A total of 27 individuals participated in the interviews.

### **Findings**

Facilitators for breastfeeding included attitude shaping, confidence, family support, knowledge acquisition, and traditional values. Barriers to breastfeeding included cultural conflict/social change, lack of commitment, lack of community support, lack of family support, lack of health care staff support, lack of knowledge about managing common problems, and mixed messages. The findings supported the theory of reasoned action in that where facilitators were present, breastfeeding was practiced. Where barriers existed, formula/mix-feeding occurred.

### **Conclusion**

Findings should be shared with members of the health care community of Guam, as well as other states and jurisdictions where Chuukese mothers migrate. Efforts should be made to address the barriers, including policy development/revision, staff education, peer-to-peer breastfeeding support, and provision of support services from non-traditional means such as through churches, non-traditional leaders, and Chuukese women's groups. Future research should address breastfeeding among other cultural groups on Guam, and how health care staff perceive their role in breastfeeding.

## CHAPTER 1: INTRODUCTION

Infant feeding is practiced differently by various groups in different societies. Breastfeeding practices are influenced by many factors, including cultures, traditions, socioeconomic pressures, and personal pressures, to name a few. Historically, as contact with industrialization and westernization occurred, alternatives became possible. Often those alternatives were not as beneficial as breastfeeding for infant health and well-being. In some societies, mothers choose not to breastfeed because formula is so easily available and convenient to use, while other mothers choose to breastfeed for the social and health benefits to themselves and their babies. (Riordan and Wambach, 2009). In Micronesia many political, social and economic factors have served to influence breastfeeding patterns in the past and present. There has been an increase in migration of Micronesians to Guam and other jurisdictions within the U.S. Affiliated Pacific Islands (USAPI), but the influence of this movement on breastfeeding patterns among this population is poorly understood. The purpose of this research is to gain a better understanding of the facilitators and barriers for breastfeeding among Chuukese migrants in Guam.

### **Overview of Importance of Breastfeeding.**

Breastfeeding is the preferred method of feeding for newborns and infants (American College of Obstetricians and Gynecologists, 2003). The advantages of breastfeeding are well documented (American Academy of Pediatrics, 2005; and Association of Women's Health, Obstetric and Neonatal Nurses, 2007). Breastfeeding is both protective of infant and maternal health and preventive of health care problems in future years. Infant health benefits related to breastfeeding include decreased incidence and severity of infectious diseases, potential

protection against sudden infant death syndrome, and protective effects against diabetes mellitus, allergies, asthma, lymphoma, ulcerative colitis, and hypertension (American Academy of Pediatrics, 2005, and Association of Women's Health, Obstetric and Neonatal Nurses, 2007). Breastfeeding enhances neurodevelopment and contributes to family and environmental health (American Academy of Pediatrics, 2005). Breastfeeding is also protective of the mother's health, providing protection against blood loss immediately following delivery, providing a contraceptive effect, and protecting against breast cancer (American College of Obstetricians and Gynecologists, 2003).

The importance of breastfeeding is emphasized through work by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF). The collaborative efforts of these organizations produced the Innocenti Declaration on the Protection, Promotion, and Support of Breastfeeding (1990), and the Baby Friendly Hospital Initiative (1991); both programs support and promote breastfeeding.

Breastfeeding has consistently been identified as a leading indicator for infant health worldwide. The U.S. Department of Health and Human Services (USDHHS, 2011) also recognizes the importance of breastfeeding and seeks to increase the incidence of breastfeeding by all mothers. It recognizes that the incidence and duration of breastfeeding decreases among all racial groups by five to six months postpartum. The Healthy People series has strived to increase the incidence of breastfeeding across the nation for many decades (USDHHS, 2011).

The current Healthy People 2020 goals (USDHHS, 2011) continue to seek to improve breastfeeding rates, and recognizes such as an important public health goal. The USDHHS notes that work is needed to promote breast feeding among low-income and certain racial/ethnic populations that are unlikely to initiate breastfeeding in the hospital or to continue breastfeeding

for the infant's first year of life. The USDHHS data comparing the 1998 breastfeeding rates to current goals indicates that these rates are not meeting the goals of 75% initiation; 50% breastfeeding at six months; and 25% breastfeeding at one year of life. (These are the same breastfeeding goals that have been in place for at least twenty years). It is recognized that certain racial and ethnic groups tend to be less likely than Caucasian women to breastfeed their babies. There is limited data about breastfeeding patterns collected for the USAPI, and none have collected about Pacific Islanders who migrate from one island jurisdiction to another. Such data are relevant and necessary as residents from these island jurisdictions have many significant health disparities. Additionally, the social disruption of migration is likely to influence choices with regards to breastfeeding.

### **Historical Perspective of Breastfeeding Practice and Problems**

#### **Nationally**

Thulier (2008) and Riordan and Wambach (2009) presented a chronological review of breastfeeding in the United States. Historically, during periods of wealth and affluence, women tended to turn to alternate methods of infant nutrition (Riordan and Wambach, 2009). Lack of breastfeeding alternatives in the early 1600s led affluent mothers to seek wet nurses to provide breastmilk for infant nutrition. Only the rich could indulge in this luxury (Thulier, 2008; Riordan and Wambach, 2009).

In 1700 colonial America, infant mortality reached levels of 50%. Although not exclusively related to the lack of breastfeeding, babies who were bottle fed did have higher mortality rates compared to breastfed babies. Many of those children died from infectious diseases such as gastroenteritis or associated illnesses related to malnutrition. Physicians of that time strongly encouraged mothers to breastfeed for as long as possible (Thulier, 2008; Riordan

and Wambach, 2009). However, despite the immunologic superiority of colostrum, there were widespread cultural beliefs that colostrum had a negative impact on infant health (Thulier, 2008).

In postcolonial America, during the 19<sup>th</sup> century and the beginning of the 20<sup>th</sup> century, a trend began in which women sought the advice of physicians and other experts regarding the best practices related to infant feeding. Involvement of physicians in what had previously been a more social decision regarding infant nutrition gave the physicians increased influence over infant feeding. During that time, pasteurization was recognized as a means to decrease bacterial contamination. As pasteurization of infant formula and sterilizations of feeding bottles became available, many physicians encouraged mothers to formula feed their babies (Thulier, 2008).

With the emergence of refrigeration and antibiotic therapy in the 1930's, infant morbidity and mortality decreased over time, and bottle feeding of infants became common. Early formulas were simple recipes based on cow's milk, either fresh or condensed. Problems with allergies to cow's milk began to emerge and formula based on other protein sources such as soy and meat were developed. In more recent years, manufacturers have allotted attention and resources to the development of an artificial means of infant nutrition that is chemically more similar to breastmilk.

World War II had a significant impact on women's role in society. Many women entered the workforce to fill needed positions previously held by men who were off to war. The impact of employment had a further damaging impact on breastfeeding. By the 1950's, society considered formula feeding as the modern form of infant feeding. Breastfeeding rates dropped from 70% initiation in the 1930's, to 38% in the mid 1960's, to an all-time low of 28% in 1970 (Thulier, 2008).

Since this all-time low, several events occurred to improve the breastfeeding rates in the United States. The La Leche League (LLL) was formed in 1956 to provide lay support to breastfeeding mothers, with the belief that mother-to-mother support was better than doctor-to-mother support. The U.S Federal Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) was established in 1974 to provide professional support to mothers and their babies, and to promote breastfeeding (Thulier, 2008).

About this time, breastfeeding research began moving forward in earnest, and research clearly documented the health benefits of breastfeeding for both mother and baby. In 1981, the World Health Organization (WHO) developed the International Code of Marketing of Breastmilk Substitutes. Unfortunately, the United States did not vote in favor of this program, and in fact was the lone dissenting vote. Also during this time, skilled lactation consultants began to emerge, and the International Board of Lactation Consultants was formed (Thulier, 2008).

In 1986, the U.S. Public Health Service recognized the need to increase breastfeeding in U.S. mothers and developed the Healthy Mothers/Healthy Babies program. The emphasis of this program was the use of volunteers to educate and support mothers in order to increase the rate of breastfeeding in the United States.

In 1990, the WHO and the UNICEF produced their Innocenti Declaration on the Protection, Promotion, and Support of Breastfeeding, followed in 1991 by their Baby Friendly Hospital Initiative. By 2008, sixty-three hospitals in the United States accomplished the goal of becoming “Baby Friendly” (Thulier, 2008) with 199 by 2014.

Today, breastfeeding continues to play an important role in infant and child health. Mothers historically received support from their own mothers and aunties who successfully

breastfed their babies. As the trend to bottle feed babies became the norm several decades ago, this support may no longer exist because a generation or more of women do not have the necessary skills and experience to help younger mothers to breastfeed. This calls for and increases the role for professional nursing and medicine to supporting breast feeding among new mothers.

### **Regionally**

Micronesia, a term used to describe island groups within portions of the western Pacific region, is an inexact term, and has changed reference over the 180 years since it was introduced. Most of the six member USAPI ( the U.S. territories of Guam, American Samoa (AS), and the Commonwealth of the Northern Mariana Islands (CNMI), as well as the three independent island nations of the Republic of Palau, the Republic of the Marshall Islands (RMI) and the Federated States of the Micronesia (FSM) lie within Micronesia. Only American Samoa (AS) lies outside of Micronesia. The FSM is comprised of four states, namely: Chuuk, Kosrae, Pohnpei and Yap. Each of these states has its own language and culture. The six USAPI jurisdictions include over 104 inhabited islands and low-lying atolls, and cover a geographical expanse greater than that of the continental United States (Levin, 2008). Appendix A provides a visual of the expanse of the USAPI. Multiple languages and cultures are represented within this region. The history of the relationship among the territories in the USAPI and multiple governments is important. Policies enacted by both the US and the individual jurisdictions have significantly impacted health systems, outcomes and breast feeding patterns in the region.

Hezel (2010), Lewis and Rapport (1995), and Taylor (2008) provide accounts of the historical changes in the health of people of the USAPI. They note that prior to outside contact, the health of the Micronesian people was reported to be quite good. Significant health changes

arose as contact with westerners occurred. Massive depopulation followed as outsiders brought infectious diseases, and induced infertility as a result of sexually transmitted infections. Never having had contact with these infectious diseases, the Micronesians were immunologically unprepared to launch response to these novel diseases, and widespread loss of life occurred.

In the early 1900's, western medicine arrived in several Micronesian jurisdictions, primarily from Germany and Japan. Public health measures such as better sanitation and quarantine were introduced, and infectious diseases were decreased.

Japanese control of the region began in 1914 and led to further improvement in health services. Following World War II, the U.S. Navy entered the health care system of the USAPI (Hezel, 2010, Lewis & Rapport, 1995, and Taylor, 2008). A survey conducted between 1948 and 1951 found the general health of the population to be excellent, with the exception of intestinal parasites, yaws, skin conditions, and tuberculosis, and there was an almost complete absence of malnutrition. Diabetes was not even mentioned, and less than 10% of the population had hypertension. There were still limited outbreaks of communicable diseases, but the incidence was declining.

Post World War II an American-modeled government infrastructure was introduced and jobs became available, and family incomes improved through employment and U.S.-provided subsidies. By the 1960s, the economy improved markedly and ships arrived carrying imported foods for purchase. Hezel (2010) calls this the “new scourge of affluence”.

The changing lifestyle altered the health of the people, and non-communicable diseases (NCD's) began to emerge. In 1956, there was virtually no diabetes, and limited numbers of people had heart disease (Hezel, 2010). Since that time, however, there has been a steady

increase in both of these illnesses, with an NCD epidemic declared by the Pacific Islands Health Officers Association (PIHOA) in recent years for all of the USAPI (Kuardei, 2010). Obesity entered the region and now contributes to most of the NCD's in Micronesia. Today, infectious disease rates have declined overall, but NCD's are at epidemic rates.

Curtis (2004) speaks of an epidemiologic transition, where countries experience social and fiscal development resulting from modernization with consequent changes in the population's health profile. In Micronesia, it represents a transition from traditional subsistence lifestyle to a cash economy. In many developed countries, this transition marks a shift away from infectious disease as a primary source of morbidity and mortality to a burden from NCD's. In developing countries, however, this transition often results in an increasing incidence of NCD's while the infectious disease burden remains. This is seen within Micronesia, as the jurisdictions struggle with the effects of modernization (Hezel, 2010).

McMurray and Smith (2001), and Shell (2002) documented the changes resulting from modernization on the residents in the RMI and Kosrae, respectively. As contact with modern society and globalization made for easier access to outside food sources, a more sedentary lifestyle was adopted. The overall disease patterns in these jurisdictions shifted. The dual burden of high rates of both communicable diseases and non-communicable diseases are now present. The island populations have failed to make the full epidemiologic transition. They must deal with the negative health aspects of both the developing and the developed world, placing a significant burden on the health care system and the entire island communities as a whole.

During the time between the end of World War II and today infant nutrition also became an issue as formula feeding began and increased, at the expense of breastfeeding. Formulas were sometimes diluted to save money, further reducing nutritional density. Vitamin A

deficiency, with resulting immune suppression and blindness, initially noted in Chuuk and Pohnpei, are seen throughout the region. While babies were suffering from under-nutrition, adults were becoming overweight and obese (WHO, 2001). Obesity is a contributing factor for many of the NCD's seen today. Virtually all of the NCDs are related to lifestyle choice.

**Importance of Breastfeeding to Infant Health.** Infant nutrition is important for reduction in infant morbidity and mortality. Over 10.8 million children under the age of 5 years die world-wide annually; 3.9 million of these are neonatal deaths. Under-nutrition affects immunity against infectious disease. Thirteen percent of these deaths could be prevented if infants were exclusively breastfed for 6 months, with another 6% prevented if adequate and safe complementary foods were introduced following exclusive breastfeeding (WHO, 2007). While under-nutrition is a significant problem in many parts of the world, obesity is also a major problem for some children. Both nutritional extremes have significant health consequences, and contribute to the NCDs in older children and adults. The United Nations (1985) found that one factor in reducing child mortality was breastfeeding; as breastfeeding rates and duration increases, mortality rates decrease. Optimal infant nutrition starts with exclusive breastfeeding. Optimal infant nutrition lays the foundation for life-long appropriate nutrition.

Limited research concerning breastfeeding patterns has been completed within the USAPI. Such data documenting breastfeeding incidence, prevalence, and factors that influence breastfeeding choice and success are relevant and necessary for the USAPI region. There are marked health disparities among this population, including severe disparities in women and children's health (Palafox, 2011). What research has been done in this arena was conducted many years ago, and is probably outdated. There is considerable migration between jurisdictions

in the USAPI, but very little is known about the impact of this migration on breastfeeding patterns among these migrants.

Marshall and Marshall (1979), in their historical review of breastfeeding practices in Chuuk State, FSM, indicate that prior to World War II, while Chuuk was under Japanese control, breastfeeding was still the norm. Following the war, when Chuuk came under U.S. control, commercial formulas were more readily available. American influence led to an increased use of cow's milk in the diet of children, and greater promotion of bottle-feeding by health care professionals. From 1945 to 1975, there was a steady increase in commercial formula use, a decrease in breastfeeding rates, and an earlier age of weaning. Marshall and Marshall also found an increase in the consumption of milk by 1-2 year-olds. They reported that these changes seemed to accelerate in the 1970s. The authors concluded that it was likely that at least some Chuukese women wanted to imitate “modern” infant feeding practices of Americans as the society transitioned from a traditional subsistence society to a cash economy. As more mothers worked outside of the home, and as others became full-time students, the time available for breastfeeding decreased. There was also found to be a strong relationship between infant feeding choice and the feeding choices of close relatives and traditional patterns. Like previous babies, subsequent babies were bottle fed, resulting in a further decline in breastfeeding rates.

In a subsequent study, Marshall and Marshall (1980) studied the diets of babies in Chuuk. They found 10% of babies were formula fed exclusively, but 41% were breastfed with formula supplementation, 31% were breastfed with supplements for 1-6 months and then exclusively formula fed. Only 18% were exclusively breastfed. Many Chuukese lived as extended families, often with 3-4 generations within a household. This allowed older female family members to influence infant feeding practices, and to serve as important sources of information about

traditional practices for care and health feeding of infants. Most families used traditional foods such as bananas, tapioca, papaya, and mango as first foods. Rice and breadfruit were added next. Fish, as the primary protein source, was introduced much later. While traditional foods comprised the diet of most babies, there was also reliance on prepared foods, beginning at 3-4 months of life. When the incidence of illness in infancy was examined, it was found that infants who had consumed any formula had a higher incidence of infectious diseases, notably respiratory, gastrointestinal, and skin disorders. They attributed this to the fact that most mothers lacked the capacity to refrigerate formula after it was prepared for consumption.

Levy, Taylor, Higgins, and Grafton-Wasserman (1988) reported on the health patterns among citizens of the RMI. This jurisdiction was noted to have the fastest growing population in the USAPI, with population density at 20,000 people per square kilometer. Adult literacy rates were quite low (25%), copra farming, income from U.S. military jobs, and grants provided the major source of cash income. Important health statistics included very high fertility rates and associated adverse health consequences (teenage pregnancy, women greater than 39 years of age bearing children, increased parity, and short birth intervals). During 1988, breastfeeding was declining among younger women, in both initiation and duration.

Crawford and Willmott (1971) studied the peoples of the Gilbert Islands (which are close to RMI). They found increased use of refined cereal and imported food since the 1950s. In addition, the very late introduction of weaning foods, decreased duration of breastfeeding, and introduction of refined and imported foods was largely responsible for poor nutrition for many Gilbertese children. Traditionally, the Gilbertese lived on fish, coconut, taro, breadfruit, pandanas, papaya, bananas, and pumpkin. Children less than one year of age fed on breastmilk and coconut. As changes occurred due to modernization, high population density with

overcrowding and the need for imported food followed. Changes led to an increased cash economy and increased pressure on available land. Residents decreased the use of coconuts and fish, and substituted sugar water for breastmilk for their babies. Within the Gilbert Islands, residents in Maiana, maintaining a more traditional lifestyle, gradually decreased the use of local produce since the 1950s, but not to the degree seen in Betio, the main village in the country. In terms of infant nutrition, fresh fish was not usually introduced into the diet until the last months of the first year, and not regularly until the second half of the second year. As lactation decreased, fish consumption as a protein source was not yet a regular food staple. This led to a number of children being underweight, with protein-calorie malnutrition. At age 5 months, most children had weight comparable to Americans and Australians. By 10 months, the weights were at the 10<sup>th</sup> percentile compared to the U.S. and Australia. Oral and eye problems associated with nutritional deficiencies began to occur. These changes were more noticeable in Betio than in Maiana. Jansen (1977) also studied the Gilbertese. He found a high percentage of mothers using breastfeeding at the onset of feeding their newborns, but some mothers also combined breastfeeding with formula feeding. At the time of the study, breastfeeding was often prolonged and introduction of complementary foods delayed. Diseases linked directly to nutritional deficits, such as Vitamin A deficiency, anemia, protein-calorie deficiencies, and other micronutrient deficiencies were present when complementary foods were added to the diet late.

**Recent Reports of Infant Feeding in the Pacific.** The WHO (2001b) reported the status of infant feeding throughout the world. The most recent data from American Samoa indicated that 94% of mothers start breastfeeding, but only 40% breastfed for 1 month and 32% breastfed for 6 months. Only 20% of babies were exclusively breastfed, and complementary foods were

begun during the first months of life by 50% of babies. During the preschool years, 31% of children were obese, and 40% were obese in kindergarten.

WHO (2001b) reported that in the CNMI, 85% of infants were breastfed, with 17% exclusively breastfed, and 31% predominantly breastfed at 4 months of age. Data from school age children showed that 33% were overweight.

The FSM (WHO, 2001b) reported that 90% of children were breastfed, with 75% still breastfed at one year of age. Forty-eight percent of children in Pohnpei between age 2 and 4 years were underweight. Unfortunately, data was reported nationally, without clear differentiation between states.

Guam (WHO, 2001a) reported 19.8% of infants were exclusively breastfed. Combining breastfeeding with formula feeding was practiced by 53.4% of mothers.

The RMI (WHO, 2001b) indicated that 95% of mothers breastfed their babies (20% exclusively). Sixteen percent were exclusively breastfeeding at 4 months, and 4% at 6 months. Fifty seven percent continued to breastfeed until 1 year of age. Underweight, rather than obesity, was the tendency in youth.

The Republic of Palau (WHO, 2001b) showed 84% of infants breastfed, with 17% still breastfeeding at 1 year of age. Fifty-six percent of babies were exclusively breastfed at four months. While 1.4% of children under age 5 years were underweight, 0.6% were overweight.

Novotny, et al., (2007) found that 73% of mothers from the CNMI breastfed, with 53% breastfeeding for 6 months, and 22% breastfeeding for one year. Those mothers who breastfed their babies had infants with lower BMI than comparable formula-fed infants. They also found that the longer the duration of breastfeeding, the lower the incidence of overweight and obesity,

indicating that breastfeeding had a small but consistent protective effect against obesity in children. This complemented the findings of Hawaiian infants studied by the same researchers.

Englberger, Marks, and Fitzgerald (2003) found that in the FSM during the past four decades, imported foods replaced the traditional foods in the diet. They also found that while breastfeeding was the norm in the 1950s, declines in breastfeeding rates accelerated in the 1970s. This led to nutrition-related illnesses including Vitamin A deficiency and anemia, and increased risk for chronic diseases. They outlined the need for further research into the nutritional content of local foods and the factors affecting the consumption of local versus commercial foods.

Gammino, Gittelsohn, and Langidrik (2007) examined the dietary intake of infants and young children in the RMI, including rural and urban areas. They found decreased duration of breastfeeding and early introduction of complementary foods contributing to poor nutritional status and increased morbidity from infectious disease among young children. While the mean duration of breastfeeding overall was 11 months, only 16% exclusively breastfed for the first 6 months of life. Supplemental foods were added to the diet as early as 1-2 months of life. They cited modernization and increasing reliance on a global economy leading to significant changes in traditional food consumption and infant/child feeding patterns. Of particular concern was the shift from breastfeeding to bottle feeding. Infant growth tended to follow the U.S. grow curve, but as the child aged, they became more and more underweight. Weaning foods were introduced earlier in babies that were not exclusively breastfed in all locales. Traditional weaning foods were widely used in all locales, but nutrient density of the traditional foods varied widely. Micronutrient deficiency was also found to be a significant health problem in young children. Commercial foods were also used, and mothers tended to believe that store-bought foods and commercial products were healthy because they came from the U.S. and were expensive. Urban

children had overall lower nutritional intake than their rural counterparts, possibly due to the heavier reliance on a cash economy in urban areas. Urban children also had poor health in general, possibly from poor nutrition, and exposure to more infectious diseases from overcrowding, poor sanitation, and inadequate safe water supply.

**Responses to Declining Breastfeeding Rates in the Pacific.** Because breastfeeding rates declined in Chuuk, modern-day health care professionals stepped up efforts to portray “breast as best” in earnest in the late 1970’s and to encourage a return to the breastfeeding tradition. In the FSM, Pretrick (1986) reported that the majority of infant mortality was linked to bottle-feeding as opposed to breastfeeding. Many mothers who bottle-feed were also working mothers. Two legislative resolutions were put into place to address this situation. One law required that bottles, nipples, and formulas can only be obtained by prescription from a physician. The other law allowed 30 days paid maternity leave, and allowed breastfeeding mothers 30 minutes leave each day for nursing their babies. Yap had addressed the need for advances in child nutrition to decrease mortality during infancy and early childhood (Rody, 1986). As health care had focused more heavily on curative rather than preventive health care, their proposal addressed the increasing incidence of malnutrition seen among bottle-feeding babies, the delayed feeding of solid foods, and the feeding of inappropriate solid foods. Their strategy was to plot infant growth on standardized growth charts so that deviations from normal growth were identified early and strategies implemented to return growth to the normal curve.

The CMNI (Easches, 1986) noted a decrease in breastfeeding that was attributed to the availability of new formulas and baby foods. Easches (1986) also cited the improper mixing of infant formulas due to directions on the label being in foreign languages. This led to numerous problems with both under- and over-mixing, both of which potentially caused serious health

problems. As a result, they established a marketing code, implemented breastfeeding and infant nutrition education through culturally appropriate pamphlets and audiovisual aids, established breastfeeding support groups, established breastfeeding policies in the hospital, and legislated extension of maternity leave to 6 weeks.

Pobocik et al. (2000) found that in working closely with adolescents on Guam, the occurrence and duration of breastfeeding was increased. Their educational program, combined with support, guided the mothers through the initiation of breastfeeding, with ongoing support throughout their experience.

Leon Guerrero (in Haddock, 2010), reported that as Guam transitioned from a rural subsistence economy to a cash economy, a shift in diet occurred from natural fruits, vegetables, meats, and fish to one with high amounts of sugar, soft canned foods, sweetened drinks, and convenience food products. The high cost of fresh fruits and vegetables (local or imported) restricted the quality and quantity of these foods in the diet. These deficiencies led to decreased vitamins and minerals in the diet. She found that pre-school children on Guam had a high incidence of iron deficiency anemia, dental caries, and gingival inflammation, all of which are attributed to poor nutrition. She also found poor nutrition contributing to susceptibility to active tuberculosis, and low birth weight. She reported that nutritionists have played a role in improving health through nutritional counseling and support systems. As Guam became more westernized, the diet became higher in fat, and the population became more sedentary. In the mid-1990s, studies conducted on Guam 5th graders' diet demonstrated a diet with increased quantities of energy-rich foods, containing excess fats, and sugars, and sugar-sweetened beverages, and decreased quantities of vitamins, minerals, and fresh fruits and vegetables. The Youth Risk Behavior Study on Guam in 1999 (Haddock, 2010) found that only 24.7% of

children had any fruits and vegetables in their diet the previous day, and 32.4% were overweight. Pobocik, Richer, and Hentges (1999) found that the diet placed the individuals at risk for chronic disease.

Most recently, the Nana Yan Patgon Act (Yamashita and Rodriquez, 2013) was passed into law, an act relative to the rights of nursing mothers and children. This law addressed mothers' right to breastfeed and supported efforts to prohibit discrimination among breastfeeding mothers. It placed a requirement on employers to provide accommodations for breastfeeding mothers. Agencies within the Government of Guam, and educational institutions are required to provide nursing rooms for mothers to comfortably breastfeed their babies (outside of restroom facilities). It tasked Guam Department of Public Health to coordinate with Guam Memorial Hospital to promote breastfeeding and provide breastfeeding education within maternal health care offices and maternal health care facilities.

Harris (1986), working in the RMI, implemented programs where health care experts taught youth about programs and health services that were available. Community outreach workers also developed radio and television ads, and implemented school and community meetings to address nutrition and family planning activities.

Communication with B. Mafnas, an International Board Certified Lactation Consultant (IBCLC) on Guam (personal communication, 2011), revealed that more than 50% of mothers began with the idea that they would breastfeed exclusively. In reality, more than 50% combined breastfeeding with formula feeding. She reported that in her experience, the best facilitators of breastfeeding involved counseling women before pregnancy, talking early during pregnancy to mothers about infant feeding choices, cost, nutritional value, and encouraging classes and support groups who provided help once the baby arrived. Barriers included non-breastfeeding

friends and family, the easy accessibility to formula, the reality of the experience with lack of preparation, and unrealistic expectations.

Mafnas also noted that while the AAP recommends beginning complementary foods at 4-6 months of life, some mothers started as early as 2 months. Foods were started slowly to assess for allergies, beginning with rice cereal, then vegetables, followed by meats. Fruit was added last. In her experience, she found that most baby foods were commercially prepared, although some mothers made their own baby food using local foods. She also noted feeding practice differences among Micronesians where it was common to give supplemental water to babies which resulted in decreased breastmilk and less nutrition. She also saw high-sodium foods given to babies as well.

Mafnas recommended that health care professionals encourage breastfeeding. She advocated educating mothers on good food practices, getting back to the basics, and less dependency on commercially prepared foods. She also recommended ensuring that the basic food groups were provided daily once complementary foods were begun.

The health of Micronesia's children is clearly in jeopardy. The changes in lifestyle as the region modernized contributed to the decline in nutrition for the past many decades. These changes in diet and activity led to a decline in health as infectious diseases remained, and NCD's reached epidemic levels.

The majority of infants are not exclusively breastfed and the duration of breastfeeding has shortened over the years. Complementary foods are added to the diet early in some jurisdictions, and very late in other jurisdictions. These complementary foods, while comprised of some local nutritious foods, most often were comprised of high sugar, commercially-prepared foods. Protein is added very late in most areas. The outcome of formula feeding in the youngest

infants is exposure to infectious disease due to poor sanitation and food storage capability. Also important is the risk of improper preparation of formula. As complementary food is introduced, the consequences become either obesity or under-nutrition with the long term consequences that lead to poor lifetime health, poor school performance, and generalized poor productivity.

### **Breastfeeding Patterns in Chuuk Over Time**

Among the USAPI, Chuuk State, FSM has some of the most serious health disparities. Chuuk is the most populous of the FSM states. Outward migration throughout the freely associated states has been significant since the Compact of Free Association was implemented with the U.S. in the 1940's. Increasing numbers of Chuukese continue to migrate, and many locate to Guam. In the last ten years, the Chuukese population on Guam rose from 6,229 (4% of the total Guam population) to currently 17,974 (11% of the total Guam population). As these residents relocated to Guam, little was known about their breastfeeding practices, and how migration impacted breastfeeding.

Marshall and Marshall (1979), in a study of Chuukese mothers, concluded that "it is likely that at least some Trukese (Chuukese) women sought to emulate what they regarded as the modern bottle-feeding practices of American women." (pg. 247). They also found that mothers traditionally made their infant feeding decisions based on advice from friends and relatives, their beliefs about optimum health for their child and themselves, convenience and cost. They further report that efforts to portray "breast as best" began in earnest in the late 1970's to return to the breastfeeding tradition.

Although limited research has been published regarding breastfeeding incidence in the other Micronesian islands, I. Nero, the Chief Nurse from Chuuk, (personal communication, June 2010) indicated that breastfeeding was the usual form of infant nutrition. No data has been

reported for the Pacific Islanders living in Guam in many years, nor has there been any definition of when breastfeeding is considered successful.

### **Changing Breastfeeding Patterns with Migration Globally**

Migration has been found to impact breastfeeding initiation and duration. Sussner, Lindsay, and Peterson (2008), studied a sample of 679 Latina, low-income mothers. One-half of the mothers had lived in the U.S. for less than eight years. They found a decline in breastfeeding as length of residence in the U.S. increased. Significant factors found included the mother's nativity, her parents' nativity, and the presence of her grandmother as a symbol of social support. The most significant finding was the adoption of English language to be correlated with declining rates of initiation and duration of breastfeeding. The authors theorize that migrant mothers may adopt the majority culture's attitudes about breastfeeding as a means to fit into the new culture and environment. They advocated a qualitative study to investigate their assumptions.

Babington (2008) studied recent Vietnamese migrants to the United States. This qualitative study included 12 mothers, 50% of whom chose to breastfeed their babies. While all mothers indicated that they realized breastfeeding was best for their babies, they struggled with work and family obligations that hampered breastfeeding success. All mothers had received information about breastfeeding from family members and health care professionals.

Harley, Stamm, and Eskenazi (2007) studied mothers of Mexican descent. In the quantitative study of 490 mothers, they found that mothers who lived their whole lives in the U.S. had lower initiation rates (83.3%) and duration to 12 months (6.8%) than mothers who had lived 5 years or less in the U.S. (94.6% and 31.8% respectively). In all groups of mothers, those

mothers who returned to work, were first-time mothers, and were younger had shorter durations of breastfeeding.

In a study of 30,586 mothers, Singh, Kogan, and Dee (2007) also found that mothers living their whole life in the United States had lower rates of breastfeeding initiation and shorter duration of breastfeeding compared to mothers who immigrated to the United States. Of the ethnic groups studied, Hispanic and Asian migrant mothers had the highest rates and longest duration of breastfeeding overall.

Celi, Rich-Edwards, Richardson, Kleinman, and Gillman (2005) surveyed 1829 multi-ethnic mothers, and found that those mothers who migrated to the US had a significantly higher likelihood to breastfeed when compared to their matched ethnicities who had long-term residencies in the U.S., as well as to whole-life residents of the U.S. Those participants who had long-term or whole-life residencies in the U.S. tended to have higher levels of education and income, as well as increased access to medical care than recent migrants. The Black and Hispanic participants tended to have lower socioeconomic status, less education, were younger, less likely to be married, were more likely to have been breastfed as an infant, and were more likely to be an immigrant, or the child of an immigrant, than their white counterparts.

Gibson-Davis and Brooks-Gunn (2006), in their quantitative study of 4207 mothers in fifteen states, found that immigrant mothers were much more likely to breastfeed when compared to long-term U.S. residents. They also found that for each year that a mother lived in the U.S., there was a 4% decrease in breastfeeding. Among Hispanic mothers, foreign-born Hispanic mothers had very high rates of breastfeeding even though they were not highly educated and lived at or below poverty levels in many instances. Their U.S.-born counterparts had better socioeconomic status and education levels, yet had a 50% lower breastfeeding rate,

suggesting that migration status rather than ethnicity was an important factor. This finding supports the findings of Carmichael, Prince, Burr, Nakamoto, and Vogt (2001) and Bonuck, Freeman, and Trombley (2005), who also found being foreign-born to be significant in the establishment of breastfeeding.

Pak-Gorstein, Haq, and Graham (2009), in their case study presentation of cultural practices that affect infant feeding, presented several aspects of care to ethnically diverse mothers that were important to breastfeeding success. They discussed colostrum, and the belief in many cultures that colostrum was not supportive of infant health, but was indeed toxic. They also discussed family support as a strong motivator for success in many cultures, and that migration, without an adequate support system and role models, could negatively impact breastfeeding. They went on to discuss the phenomena of “mix feeding” where mothers combined breastfeeding and formula feeding. They viewed this from two view points. One supported the idea that migration placed the mother in a position to see more commercial advertisements enticing mothers to formula feed. The other view point was that under-nutrition, being a reality in many developing countries, supported the use of formula which allowed the mother to quantify the amount of milk taken.

Jessri, Farmer, and Olson (2012), conducted a qualitative study of Middle Eastern mothers who had migrated to Canada and found that culture/religious beliefs helped guide the breastfeeding experience. Mothers reported some concerns with maintaining breastfeeding during religious periods such as Ramadan. Social support of breastfeeding in Canada was found to be less encouraging of breastfeeding than their home countries. Mothers cited less support from employers for breastfeeding in Canada, so continuation of employment was an issue. Also, breastfeeding in public was less accepted in Canada. Mothers were critical of Canadian health

care professionals, and found most non-supportive of breastfeeding. Although many of the mothers were living far distant from their close friends and family, they continued to feel support from them. All mothers were very supportive of breastfeeding, and planned to breastfeed for at least two years, although they faced several challenges in terms of common problems of breastfeeding, employment, and social support in country. The authors attributed this strong support of breastfeeding to the religious beliefs of each of the mothers. Dennis, Gagnon, Van Hulst, and Dougherty (2012) also completed a Canadian-based study that compared migrant mothers and Canadian-born mothers. They found differing risk factors for breastfeeding challenges, and suggested that differing groups might benefit from differing strategies to support breastfeeding success.

These studies consistently showed the impact of support, motivation, and education in the breastfeeding decision. They also showed the impact that acculturation, with exposure to alternate forms of infant feeding, and social support, had on breastfeeding initiation.

### **Migration within the USAPI**

The United States is a nation of immigrants. Most Pacific Islanders also came to their current locale as a result of migration, either from intra-island, inter-island, or international migration. Guam is a small island jurisdiction which became a U.S. territory following the Spanish American War in 1898. Situated in Micronesia in the western Pacific Ocean, it serves as the most developed USAPI west of the Hawaiian Islands (Bureau of Statistics and Planning (2012). Guam frequently provides support to the other USAPI jurisdictions. Many of these jurisdiction residents transit through, and relocate to Guam.

The Trust Territory of Pacific Islands was established in 1947, when the United States entered into a trusteeship with what was to become the Federated States of Micronesia, the

Republic of the Marshall Islands, the Republic of Palau, and the Commonwealth of the Northern Mariana Islands. These countries are also known as the freely associated states. During the Carter Administration, in the late 1970s, large numbers of Micronesian emigrants entered the U.S. for schooling (Levin, 2008). The four states of the FSM became an independent nation in 1978, and remained under the authority of the United States until 1986, when the Compact of Free Association went into effect. The Compact provided substantial economic assistance to the FSM for fifteen years, and allowed migrants to enter into, legally engage in work, and establish residence within the U.S. without limitation on their length of stay. Until this time, migration to Guam from the freely associated states was minimal, representing 2.1% of the total Guam population. With the implementation of the Compact, migration began to increase, and Guam experienced increasing numbers of migrants from the mid-1980's to mid-1990's. The largest numbers of migrants came from Chuuk (Yager, 2001). Most migrants came to Guam for employment or education, seeking better lives for themselves and their families. By 2000, Guam had the highest numbers of migrants of all the U.S. affiliated locales, representing 5% of Guam's total population. This outward migration allowed total population growth in Chuuk to remain static, while Gootnick (2011) and Morrison (2011) report increasing numbers of Micronesian migrants in both Guam and Hawaii, with 12% of Guam's population now compact migrants. These migrants tend to be less educated, secure low paying jobs, and live at or below the poverty level. Data from the Bureau of Statistics and Planning on Guam (2012) estimate there are 17,974 Chuukese living on Guam, representing 11.2% of the total population. This data is similar to the data produced by the FSM government (2012) and the FSM Office of Statistics, Budget, and Economic Management (2012) which indicate that 78% of the Guam migrants from FSM are

Chuukese, or between 10,575 and 10,943 persons. The top three reasons for migration are employment, family reasons, or education.

Lewis and Rapaport (1995) described the epidemiological changes that occurred, that affected public health delivery. While including more than just the Micronesian region, they cited the diversity across the region, and social and political development as key factors in the epidemiological transition. They reported much of the same history of the region as cited by Hezel (2010). One issue cited by Lewis and Rapaport (1995) that was not eluded to by Hezel, was the sometimes intensive migration, with impressive increases in remittance incomes to aid those left behind. The transition noted that tertiary medical services became a common reason for travel abroad. This placed a very high financial burden on already challenged health care services of the State. Some jurisdictions used half of their budgeted resources for health on these referrals. This practice was in place at the same time that significant cuts to the gross national product were made for education and health in most jurisdictions. Migration within the USAPI had both positive and negative consequences for the migrants in terms of health, economics, and social support, and likely effects breastfeeding patterns.

### **Problem Statement**

Breastfeeding has long been known to have a positive impact on infant health. The Centers for Disease Control and Prevention (CDC), supports “protecting, promoting, and supporting breastfeeding”. Their 2009 Breastfeeding Report Card (2009), while only providing data from the fifty states and the District of Columbia, found that many states fall short of the recommended rates for initiation and duration of breastfeeding. Limited research has been completed within the United States Affiliated Pacific Islands (USAPI) to document breastfeeding

incidence and even less is known about breast feeding among Micronesians who migrate within the USAPI.

Despite much research worldwide describing the breastfeeding experience, there is a dearth of research describing breastfeeding experiences in the USAPI. In addition, limited research of any sort has been conducted to determine the facilitators and barriers to breastfeeding for mothers in the region. However, there are many studies indicating factors that impact the breastfeeding decision in other parts of the world. Furthermore, there is no data about facilitators and barriers for initiating and continuance of breastfeeding among Micronesian migrants in Guam, and no data for Chuukese migrants, who comprise the largest numbers of migrants to Guam. A study that identifies facilitators and barriers for breastfeeding among Chuukese mothers who migrate to Guam would expand the knowledge base for women and children's health in the region.

### **Significance**

The outcome of this research will allow health care teams on Guam to actively promote breastfeeding, and potentially develop breastfeeding policies that could benefit Micronesian migrants within the USAPI. Data derived from this research is needed to make health care decisions, develop culturally appropriate health promotion activities, and support breastfeeding policy development. This study will advance the knowledge of infant health care within this understudied population.

### **Purpose**

The purpose of this study is to document the facilitators and barriers to breastfeeding among Chuukese mothers who have migrated to Guam, using a standardized definition of breastfeeding, and to identify the facilitators and barriers to successful breastfeeding among

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those mothers. The research question to be addressed is: “What are the facilitators and barriers to successful breastfeeding among migrant Chuukese mothers living on Guam?”

## **CHAPTER 2: REVIEW OF LITERATURE**

The U.S. Surgeon General (U.S. Department of Health and Human Services, 2011), also recognizes the important role of breastfeeding in promoting and supporting health for mothers and babies, and has outlined several actions to support breastfeeding as a means to promoting health. Such actions include maternal support individually, in groups, within the health care system and at work, education programs for fathers, grandmothers and health care providers, community-based support, national campaigns, policies on the marketing of infant formulas, access to lactation consultation services, maternity leave, and support for breastfeeding research.

There is no one term that is consistently used to denote successful breastfeeding. The term breastfeeding is used to describe many different levels of breastfeeding in terms of exclusivity (e.g. breast milk only or breast milk and food), duration and impact on mother and baby. The overall goals in the U.S. is to observe 75% of women initiating exclusive breastfeeding at birth, 50% of babies breastfeeding at six months, and 25% of babies still receiving breast milk at one year of life.

None of the studies that have examined breastfeeding among women in the USAPI defined what would be considered to be “successful breastfeeding”. Instead they have focused on factors such as incidence rates or exclusive breastfeeding versus breastfeeding combined with formula feeding.

### **Studies of Breastfeeding**

#### **Historical Research of Breastfeeding**

**Globally.** Consistent definitions of breastfeeding have not been used across breastfeeding research or programs that aim to support breastfeeding worldwide. As early as the 1950s, concern about the decline in breastfeeding was reported (Jelliffe, 1955; Jelliffe, 1956). His work continued for the next 30 years (Jelliffe, 1976; Jelliffe, 1967; Jelliffe, 1986), focusing on the identification of factors contributing to the decline in breastfeeding. However, no actual definition of breastfeeding was stated in his publications, but he did recognize breastfeeding for its dyadic nature with “nutritional, psychological, and biological interaction between mother and offspring with each affecting the other” (Jelliffe, 1976, pg 1227; Jelliffe & Jelliffe, 1981, pg 145). Jelliffes’ international work highlighted the decline in breastfeeding worldwide as Western contacts expanded. Documented breastfeeding initiation rates in England declined from 77.2% in 1929-1930 to 55% in 1942, and 36.2% in 1949 (Jelliffe, 1956). While formula feeding was primarily practiced by women from the upper socioeconomic status, his concern was that the phenomena would spread to middle and low socioeconomic levels (Jelliffe, 1955), and identified partial breastfeeding in practice in Jamaica. Jelliffe also identified the importance of prolonged breastfeeding in some developing tropical countries (1955; 1956; 1967).

**Nationally.** Thulier and Mercer (2009), explored the history of breastfeeding in America, and demonstrated that breastfeeding rates varied across time. Data from the National Center for Human Statistics (1966; 1978), and the Office of the Assistant Secretary for Health (1979), (as cited in Thulier and Mercer, 2009), reported 70% initiation rates in the 1930s with 45% still breastfeeding at 3 months, with a steady decline to a low of only 28% initiation in the 1970s with 8% still breastfeeding at 3 months. She cited reversal of this trend in 2004 with 73% initiation; 30% still breastfeeding at 3 months; and 11% breastfeeding at 6 months. No definition

of breastfeeding was provided, and exclusive versus mixed (breast milk and food) were not articulated in the report.

Bain (as cited in Jackson, Wilkin, and Auerbach, 1956), reported on a nationwide survey in the United States in 1948 which found that 38% of new mothers were exclusively breastfeeding, 27% combining breastfeeding with formula feeding, and 35% exclusively formula feeding upon discharge from U.S. hospitals.

The work of these early researchers illustrated that breastfeeding practices were declining in the U.S. and worldwide. The potential negative health impact was recognized.

By 1990, researchers recognized the need for consistent definitions of breastfeeding. Labbok and Krasovec (1990) and Labbok and Coffin (1997) called for consistency in breastfeeding definitions guiding research in the United States. Hill, Ledbetter, and Kavanaugh (1997), in their research of breastfeeding with low-birth weight infants, also found the need for uniformity in breastfeeding definitions. Yet, years later, the research continued to show inconsistencies in the definitions used to document breastfeeding. Cattaneo, Davanzo, and Ronfani (2000), found inconsistencies in the definitions of breastfeeding throughout Italy, while Binns, Frazer, Lee, and Scott (2009) called for consistency in use of breastfeeding definitions in Australia. Ip et al., (2007) found the need to use consistent breastfeeding definitions in their study of breastfeeding and maternal child health outcomes in developed countries. Smith (2003), demonstrated an understanding of the complexity of defining successful or effective breast feeding, and noted that breastfeeding is multi-factorial and individually perceived by women.

Successful breastfeeding was not specifically addressed in these publications. Articulating a clear definition of successful breastfeeding and gaining a better understanding of

patterns and factors that influence breastfeeding in the USAPI will assist with increasing successful breastfeeding in the Region.

Historically, breastfeeding was described as putting the infant to the mother's breast. In 1990, Labbok and Krasovec described breastfeeding patterns they observed in research: full, partial, and token. They further divided full breastfeeding into exclusive and almost exclusive, and partial breastfeeding into high, medium, and low. The World Health Organization and UNICEF (1990) recognized breastfeeding in their Innocenti Declaration,

Breastfeeding is a unique process that: Provides ideal nutrition for infants and contributes to their healthy growth and development, reduces incidence and severity of infectious diseases, thereby lowering infant morbidity and mortality, contributes to women's health by reducing the risk of breast and ovarian cancer, and by increasing the spacing between pregnancies, provides social and economic benefits to the family and the nation, and provides most women with a sense of satisfaction when successfully carried out. (World Health Organization and UNICEF, 1990, pg. 1)

Fifteen years later, the Innocenti Declaration was updated to call for action to support and empower women to make breastfeeding a means for improving the health of their babies, to ensure that governments review and strengthen policies to support breastfeeding, to guide community-based organizations to provide technical guidance and support to mothers, and encourage public interest organizations to give priority to breastfeeding as an optimal feeding practice (2005).

Different authors and organizations described breastfeeding differently in terms of general definition, timing for initiation, recommended duration, exclusivity vs. concomitant use

of formula or other foods. The WHO (2007) recommended that breastfeeding should be initiated within one hour of birth, with no supplementation during hospitalization. Labbok further refined the definitions/patterns of breastfeeding in 2000 and added the category “almost exclusive” to address ingestion of liquids, traditional foods, vitamins, medications, and so forth. The Academy of Breastfeeding Medicine published their position paper on breastfeeding, and included additional definitions of breastfeeding in 2008. They categorized breastfeeding as “breastmilk feeding” (which is further defined as exclusive breastfeeding, except when medications were administered), “human milk feeding”, and “artificial breastmilk substitutes”. Key recommendations included improved promotion of breastfeeding globally through governmental and non-governmental support, education of health care providers, promotion of policies to address appropriate use of breastmilk substitutes, and employer support of breastfeeding. Table 1 compares and contrasts the work of WHO, Labbok, and The Academy of Breastfeeding Medicine. Each author addressed similar aspects of breastfeeding, but their definitions suggested subtle differences.

Table 1: Comparison/contrast of breastfeeding definitions among three groups.

<b>Breastfeeding Category</b>	<b>WHO/UNICEF (1991)</b>	<b>Labbok (2000)</b>	<b>The Academy of Breastfeeding Medicine (2008)</b>
Breastfeeding definition	The infant has received breast milk direct from the breast or expressed.		The mother/child act of milk transference
Exclusive breastfeeding	The infant has received only breast milk from the mother or a wet nurse, or expressed breast milk, and no other liquids or solids with the exception of drops or syrups consisting of vitamins, mineral supplements, or medicines.	No other liquid or solid from any other source enters the infant’s mouth.	No other liquid or solid is fed to the infant, with the exception of medicines.
Almost exclusive		Allows occasional tastes of other liquids, traditional foods, vitamins, medicines, etc.	
Predominant breastfeeding	The infants’ predominant source of nourishment has been breast milk.		

	However, the infant may also have received water and water-based drinks (sweetened and flavored water, teas, infusions, etc.), fruit juice; oral rehydration salts solution (ORS), drop and syrup forms of vitamins, minerals and medicines, and ritual fluids (in limited quantities). With the exception of fruit juice and sugar water, no food-based fluid is allowed under this definition.		
Full breastfeeding	Exclusive breastfeeding and predominant breastfeeding together constitute full breastfeeding.	Includes exclusive and almost exclusive.	
Full breast milk feeding (or fully breast milk fed)/Breastmilk feeding/Human milk feeding		The infant receives expressed breast milk in addition to breastfeeding.	Provision of mother's milk to the infant. Feeding of human milk from any other individual or pooled milk.
Partial		Mixed feeding, designated at high, medium, or low. Methods for classification suggested include percentage of calories from breastfeeding, percentage of feeds that are breastfeeds, etc. Any feeding of expressed breast milk would fall under this category.	
Complementary feeding	The child has received both breast milk and solid or semi-solid food.		
Token		Minimal, occasional breastfeeds (for comfort or with less than 10 percent of the nutrition thereby provided.)	
Bottlefeeding/Commercial Infant Formula Feeding	The infant receives no breastmilk.		Artificial breastmilk substitute feeding.

### Successful breastfeeding

During 2000, combinations of these definitions were used to describe successful breastfeeding. Cattaneo et al. (2000) refined the WHO definition of breastfeeding, and established categories of breastfeeding as exclusive, predominant, and complementary, as well as

non-breastfeeding to further define breastfeeding. Their definition of breastfeeding allowed the infant to receive other foods or liquids including non-human milk.

Labbok and other collaborators (Labbok, Belsey, & Coffin, 1997; Coffin, Labbok, & Belsey, 1997; Labbok, 2008; and Labbok, 2011) continued to support the original work of Labbok and Krasovec (1990). Their research continued to follow the definitions that were published in 1990. Consistency in the definition of successful breastfeeding is key to establishing baseline data for comparison and policy development.

The works of these researchers specifically categorized/quantified feeding, but did not define successful breastfeeding or address the factors associated with the successful breastfeeding. Some authors used the term effective breastfeeding. Hill, Ledbetter, and Kavanaugh (1997) followed the patterns of breastfeeding as described by Labbok and Krasovec (1990), (exclusive breastfeeding, > 80% breastfeeding, 50-80% breastfeeding, 20-49% breastfeeding, < 20% breastfeeding, and token or comfort feeding) for their research, but suggested that the definition be further explored. Mulder (2006) further described effective breastfeeding as “the interactive process between mother and infant, resulting in the direct transfer of breast milk from the mother’s breast to the infant in a manner and quantity adequate to meet both maternal and infant needs.” (p. 334). Her research focused highly on the initiation of breastfeeding, specifically such factors as infant and maternal readiness, and the physical aspect of rooting, positioning, latching, and suckling. Mulder (2009) also investigated effective breastfeeding as described as either exclusive breastfeeding or breastfeeding with supplementation. Edwards (2009) utilized the Healthy People 2010 definitions of breastfeeding. Riordan, Gill-Hopple, and Angeron (2005) described the act of latching and suckling and milk intake. The work of each of these authors also sought to quantify breastfeeding and address the

biological aspects of the act of breastfeeding. Their work did not address the psychosocial aspects which address the art of breastfeeding.

Smith (2003), while not actually defining breastfeeding, found it to be multifactorial and individually perceived by women. Driscoll (1992) defined breastfeeding as a personal experience for mothers. She further defined breastfeeding as successful when it empowered “the mother to promote a feeling of personal growth and development.” (p. 565). She indicated that breastfeeding is “an intimate relationship between a mother and her infant. It is a personal experience that is defined as successful or as a failure by the mother alone.” (p. 569). Loh (2000) looked at what she termed “successful breastfeeding” in Hawaii. Her research focused on the use of the Healthy People 2000 objectives for breastfeeding success. Leff, Gagne, and Jefferis (1994) described successful breastfeeding as “a complex interactive process resulting in mutual satisfaction of maternal and infant needs” (p. 99). Duration was not a dominant measure of success to them.

Hoddinott and Pill (2000) defined breastfeeding initiation as “any baby who is put to the breast, even if only once”. (p. 227). Kuan et al. (1999) defined breastfeeding success based on maternal perspectives. Isabella and Isabella (1994) indicated successful breastfeeding was a relationship between mother and baby in which the “mother anticipates infant’s needs and responds accordingly, thereby receiving positive reinforcement and validation of her role as mother” (p. 263). Auerbach (1994), stated that only the mother can qualify breastfeeding as successful or not, and recognizes that quantifying defeats this activity. Table 2 indicates the manners in which successful breastfeeding has been described. Clearly, the physical act and biological aspect of breastfeeding predominates. The psychosocial aspects take the backstage in the literature. The term breastfeeding connotes providing breast milk to the baby, the mechanical

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act, as opposed to the concept of successful breastfeeding, which integrates this biological aspect with psychosocial dimensions. Successful breastfeeding is a more complex concept that integrates the biological aspect of breastfeeding, with the wholistic concepts of body, mind, and spirit. It is best approached through qualitative means.

Table 2: Successful Breastfeeding

	Categories of Successful Breastfeeding	Interactive Process Between Mother and Baby	Physical Readiness	Maternal Perspective (defined by mother)	Maternal Personal Growth and Development (validation of maternal role)	Personal Reinforcement
Auerbach (1994)				X		
Cattaneo et al (2000)	X					
Driscoll (1992)					X	
Edwards (2009)	X					
Hill, Ledbetter, Kavanaugh (1997)	X					
Hoddinott, Pill (2000)	X					
Isabella, Isabella (1994)					X	X
Kuan et al. (1999)				X		
Labbok and collaborators (1997, 1997, 2008, 2011)	X					
Leff, Gagne, Jefferis (1994)					X	
Loh (2000)	X					
Mulder (2006)		X	X			
Mulder (2009)	X					
Riordan, Gill-Hopple, Angeron (2005)			X			
Smith (2003)				X		

### **Attributes for Successful Breastfeeding**

Attributes are key characteristics that recur repeatedly throughout the literature. The attributes identified from this concept analysis included reciprocity, improved health/well-being, and fulfillment. Exclusive breastfeeding and sustained duration aid the achievement of these characteristics.

### **Antecedents to Successful Breastfeeding**

**Initiation of breastfeeding.** Several antecedents have been found to support successful breastfeeding. Mother related reasons for wanting to breastfeed (Brodribb, Fallon, Hegney, & O'Brien, 2007; Nelson, 2006; Brand, Kothari, & Stark, 2011) and infant temperament (Driscoll, 1992; Nelson, 2006) were important to the beginning breastfeeding experience. Previous breastfeeding experience, contact with others breastfeeding, and multiparity (Carmichael, Prince, Burr, Nakamoto, & Vogt, 2001; Hoddinott & Pill, 2000; Kruse, Denk, Feldman-Winter, & Rotondo, 2006; Sutherland, Pierce, Blomquist, & Handa, 2011; MacGregor & Hughes, 2010) aided the mother in beginning breastfeeding. Moore and Coty (2006) also found that being future-oriented aided with intent to breastfeed. Renschler (1991) found that motivation and commitment were key to successful breastfeeding.

Several factors were important to initiation of breastfeeding. Assistance with/support in initiation of breastfeeding (Cramton et al., 2009; Cricco-Lizza, 2005; Hoddinott & Pill, 2000; Kuan et al, 1999; MacGregor & Hughes, 2010), rooming in (Cramton et al., 2009; Elliott & Gunaratnam, 2009; Isabella & Isabella, 1994; Moore & Coty, 2006), and unrestricted access to baby (Cramton et al., 2009) all facilitated the initiation of breastfeeding.

**Demographics of successful breastfeeding.** Certain maternal demographics such as age, educational level (Birenbaum, Fuchs, & Reichman, 1989; Dulong, Kersting, & Bender, 2003;

Jackson, Wilkin, & Auerbach, 1956; Kemberling, 1979; Kuan et al. 1999; Renschler, 1991; Thulier & Mercer, 2009; and Winicoff, Laukaran, Myers & Stone, 1986), culture (Birenbaum, Fuchs, & Reichman, 1989; Jackson, Wilkin, & Auerbach, 1956; Kemberling, 1979; Kruse et al., 2006; Thulier & Mercer, 2009; Winicoff, Laukaran, Myers & Stone, 1986); family income and marital status (Birenbaum, Fuchs, & Reichman, 1989; Flood & Dodgson, 2010; Kemberling, 1979; Renschler, 1991; Thulier & Mercer, 2009; Whalen & Cramton, 2010; Winicoff, Laukaran, Myers & Stone, 1986); non-smoker (Birenbaum, Fuchs, & Reichman, 1989); previous breastfeeding success (Birenbaum, Fuchs, & Reichman, 1989); and parity (Jackson, Wilkin, & Auerbach, 1956) were important antecedents to breastfeeding success. Table 3 shows the demographic characteristics of the breastfeeding mother. Dulon, Kersting, and Bender (2003) found younger mothers more likely to breastfeed, while Jackson, Wilkin, and Auerbach (1956) found older mothers more likely to breastfeed. Birenbaum, Fuchs, and Reichman (1989) found less educated mothers more likely to breastfeed, while other authors discovered that higher levels of education correlated with increased breastfeeding (Jackson, Wilkin, and Auerbach, 1956; Kemberling, 1970; Renschler, 1991; Thulier and Mercer, 2009; Whalen and Cramton, 2010; and Winicoff, Laukaran, Myers, and Stone, 1986). Most authors found Caucasians more likely to breastfeed (Birenbaum, Fuchs, and Reichman, 1989; Jackson, Wilkin, and Auerbach, 1956; Kruse, et al. 2006; and Thulier and Mercer, 2009). Kemberling (1979), Whalen and Cramton (2010), and Winicoff, Laukaran, Myers, and Stone (1986) found non-white mothers more likely to breastfeed. Most authors found higher socioeconomic status correlated with increased breastfeeding (Birenbaum, Fuchs, and Reichman, 1989; Flood and Dodgson, 2010; Kemberling, 1979; Renschler, 1991; Whalen and Cramton, 2010; and Winicoff, Laukaran, Myers, and Stone, 1986). Dulon, Kersting, and Bender (2003) and Thulier and Mercer (2009) found lower-income

mothers more likely to breastfeed. Mothers who were married or living with their partner were found to be more likely to breastfeed than single mothers (Birenbaum, Fuchs, and Reichman, 1989; Kuan, et al. 1999; and Thulier and Mercer, 2009). Authors were split on the parity of mothers (Jackson, Wilkin, and Auerbach, 1956; and Whalen and Cramton, 2010), but previous breastfeeding experience was found to support subsequent breastfeeding behavior (Birenbaum, Fuchs, and Reichman, 1989; Dulong, Kersting, and Bender, 2003; and Whalen and Cramton, 2010). Birenbaum, Fuchs, and Reichman (1989) found non-smokers were breastfeeders.

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Table 3: Demographics and Behavioral Characteristics of the Breastfeeding Mother

	Age		Educational Level		Culture		Family Income		Marital Status		Parity		Previous Breastfeeding Experience	Smoking	
	Younger	Older	Less Education	More Education	Caucasian	Non-White	Low SE Status	High SE Status	Single	Married/Live with Partner	Primipara	Multipara		Non-smoker	Smoker
Birenbaum, Fuchs, & Reichman (1989)			X		X			X		X			X	X	
Dulon, Kersting, & Bender (2003)	X						X						X		
Flood & Dodgson (2010)								X							
Jackson, Wilkin, & Auerbach (1956)		X		X	X						X				
Kemberling (1979)				X		X		X							
Kuan, et al. (1999)										X					
Kruse, et al. (2006)					X										
Renschler (1991)				X				X							
Thulier & Mercer (2009)				X	X		X			X					
Whalen & Cramton (2010)				X		X		X				X	X		
Winicoff, Laukaran, Myers, & Stone (1986)		X				X		X		X		X			

**Maternal psychological factors that influence breastfeeding.** Several authors found that confidence, self-esteem, self-efficacy, and self-concept are factors that characterize mothers who successfully breastfeed their babies. These characteristics are outlined in Table 4, and described below. Avery, Zimmerman, Underwood, and Magnus (2009) found that confidence was very important, but commitment was also important. Brand, Kothari, and Stark (2011), also found confidence and commitment led to breastfeeding success. They additionally found that mothers who breastfed previously were more likely to breastfeed subsequent babies. Britton and Britton (2008), focused on self-concept in their research. They found that self-satisfaction, value as a family member, moral worth were key factors related to exclusive breastfeeding. Chin and Solomonik (2009), found social structures within a woman's life were important, with vulnerable women less likely to breastfeed. Mothers who had supportive situations that led to confidence building were more likely to breastfeed (Cramton et al., 2009). Driscoll (1992) reported that competence at the physical act of latching and feeding was important, as well as confidence, value, and self-esteem. Entwistle, Kendall, and Mead (2009) found key determinants to successful breastfeeding were self-confidence, positive social environment, knowledge of breastfeeding, and access to maternal care services. Hoddinott and Pill (2000), focused on confidence. Jelliffe (1955; 1956; 1967; 1976) repetitively found maternal attitude to be key to breastfeeding success. Kemberling (1979) also found confidence-building to be important to breastfeeding success. Kools, Thijs, Kester, and de Vries (2006) found that mothers with higher ratings of self-efficacy had higher rates of breastfeeding. Moore and Coty (2006) found that positive breastfeeding experiences fostered more confidence and commitment to continued breastfeeding. Racine et al. (2009) found that motivation is important to success at breastfeeding despite difficulties initiating or continuing breastfeeding, while Driscoll (1992) found that

competence with breastfeeding was important. Sutherland, Pierce, Blomquist, and Handa (2011) found that successful breastfeeding with a first pregnancy led to successful breastfeeding with subsequent babies.

In a quantitative study of 382 Hispanic, Black, and Asian mothers by Bonuck, Freeman, and Trombley (2005), it was found that being foreign-born, and having previously breastfed a child were significant predictors of breastfeeding in subsequent pregnancies.

Table 4: Maternal Psychological Factors

	Confidence	Commitment	Vulnerability	Self-Esteem/ Self-Concept	Competence	Attitude	Self- Efficacy	Motivation
<b>Avery, Zimmerman, Underwood, Magnus (2009)</b>	X	X						
<b>Bonuck, Freeman, Trombley (2005)</b>	X							
<b>Brand, Kothari, Stark (2011)</b>	X	X						
<b>Britton, Britton (2008)</b>				X				
<b>Chin, Solomonik (2009)</b>			X					
<b>Cramton, Zain-Ul-Abideen, Whalen (2009)</b>	X							
<b>Driscoll (1992)</b>	X			X	X			
<b>Entwistle, Kendall, Mead (2009)</b>	X							
<b>Hoddinott, Pill (2000)</b>	X							
<b>Jelliffe (1955, 1956, 1967, 1976)</b>						X		
<b>Kemberling (1979)</b>	X		X					
<b>Kools, Thijs, Kester, de Vries (2006)</b>							X	
<b>Moore, Coty (2006)</b>	X	X						
<b>Racine et al. (2009)</b>								X
<b>Sutherland, Pierce, Blomquist, Handa (2011)</b>	X							

**Time.** Having time, or willingness to invest the needed time for breastfeeding and family obligations were key factors that impacted successful breastfeeding. Babington and Patel (2008), Flood and Dodgson (2010), and Kools, Thijs, Kester, and de Vries (2006) found that work and school obligations affected successful breastfeeding, with Babington and Patel (2008), and Flood and Dodgson (2010) also finding family responsibilities impacting breastfeeding success. As these obligations increased, breastfeeding success decreased. Chin and Solomonik (2009) also found time to impact breastfeeding success. Also, health care professionals investing time in the breastfeeding experience (Brand, Kothari, & Stark, 2011; Hoddinott & Pill, 2000; Kuan et al. 1999; and MacGregor & Hughes, 2010) was key to breastfeeding success. Table 5 shows the aspects of time that are important to successful breastfeeding.

Table 5: Time

	Work/School	Family Responsibilities	Lack of Time	Health Care Professionals Time Commitment
Babington, Patel (2008)	X	X		
Brand, Kothari, Stark (2011)				X
Chin, Solomonik (2009)			X	
Flood, Dodgson (2010)	X	X	X	
Hoddinott, Pill (2000)				X
Kools, Thijs, Kester, de Vries (2006)	X			
Kuan et al. (1999)				X
MacGregor, Hughes (2010)				X

**Knowledge.** Knowledge gained from family, peers, health care professionals (Babington & Patel, 2008; Barona-Vilar, Escriba-Aguir, & Ferrero-Gandia, 2009; Cramton et al., 2009; Flood & Dodgson, 2010; Kemberling, 1979; Kuan et al., 1999; Morrison, Reza, Cardines, Foutch-Chew, & Severance, 2008; Elliott & Gunaratnam, 2009), and mass media (Baker, Sanei, & Franklin, 2006; Sarasua, Clausen, & Frunchak, 2009) were additional attributes to breastfeeding success. Henderson and Redshaw (2010) found that the decision to breastfeed antenatally, combined with consistent professional advice, practitioner help, and active support and encouragement were keys to success. Likewise, Winicoff, Laukaran, Myers and Stone (1986) found that consistent information from health care professionals was key to breastfeeding support and success. Bhutta and Labbok (2011) found that group and individual counseling, and prenatal interventions were key to breastfeeding success with mothers from developing countries. Table 6 summarizes the knowledge component of successful breastfeeding.

Hauck, Hall, and Jones (2007), in assessing breastfeeding duration, theorized that the use of a breastfeeding journal as part of an educational program, could increase the duration of breastfeeding. In their quantitative study of 276 mothers (140 control; 136 intervention), using breastfeeding self-efficacy as their basis, they found no difference between the intervention and control groups. In discussing the limitations of their study, concluded that the timing of the distribution of the breastfeeding journal, and a broader selection of participants should be altered in future studies.

Kruse, Denk, Feldman-Winter, and Rotondo (2006) reviewed birth records from 67,585 Caucasian, Black, and Hispanic mothers who delivered first and subsequent babies. They found fluidity in decision-making from one pregnancy to another, supporting the idea of continued

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education and support for all pregnancies. Overall, first pregnancies had more exclusive breastfeeding, however.

Table 6: Knowledge

	Maternal	Family	WIC	Health Care Professionals	Mass Media	Husband	Group Counseling
Babington, Patel (2008)	X	X	X	X			
Baker, Sanei, Franklin (2006)				X	X		
Barona-Vilar, Escriba-Aguir, Ferrero-Gandia (2009)				X		X	
Bhutta, Labbok (2011)				X			X
Cramton, Zain-Ul-Abideen, Whalen (2009)				X			
Elliott, Gunaratnam (2009)		X		X			
Flood, Dodgson (2010)	X						
Henderson, Redshaw (2010)				X			
Kemberling (1979)				X			
Kuan et al. (1999)				X			
Morrison, Reza, Cardines, Foutch-Chew, Severance (2008)		X		X		X	
Sarasua, Clausen, Frunchak (2009)				X	X		
Winicoff, Laukaran, Myers, Stone (1986)				X			

**Health policy and support.** Health care policy and health care system policies were key to supporting breastfeeding initiation and continuation (Baker et al., 2006; Cramton et al., 2009; Driscoll, 1992). Brand, Kothari, and Stark (2011) found that prenatal care, face-to-face (rather than disseminated information), and adequate maternity leave policies increased breastfeeding success. Winicoff, Laukaran, Myers, and Stone (1986) found that lack of sound policies was an impediment to breastfeeding. Additionally, support from family and health care professionals, including consistent correct information (Barona-Vilar et al., 2009; Chin & Solomonik, 2009; Cramton et al., 2009; Driscoll, 1992; Flood & Dodgson, 2010; Hoddinott & Pill, 2000; Kuan et al., 1999; Morrison et al., 2008; Nelson, 2006; Sarasua et al., 2009; Elliott & Gunaratnam, 2009; Isabella & Isabella, 1994; Winicoff, Laukaran, Myers & Stone, 1986; Moore & Coty, 2006) were more likely present in the mother who successfully breastfed.

Carmichael, Prince, Burr, Nakamoto, and Vogt (2001), in their quantitative study of 535 mothers, found that while 82% of Hawaiian mothers receiving support through a Supplemental

Nutrition Program for Women, Infant, and Children (WIC) program initiated breastfeeding, nearly half of those mothers turned to formula supplementation within a week of delivery. The factors that supported breastfeeding included previous breastfeeding experience, a close family member or friend who had previous breastfeeding experience, having had one or more children previously, Asian/Pacific Island ethnicity (except Filipino), and being foreign-born. The mothers who introduced formula early were working or going to school, teen-aged, and Hawaiian/part Hawaiian or Filipino ethnically.

Morrison, Reza, Cardines, Foutch-Chew, and Severance (2008) in their qualitative study, conducted focus groups and one-on-one interviews with 33 young mothers from Hilo, Hawaii. They found that approximately one-third of mothers exclusively breastfed their babies for two to three months. They found that support from their mother and/or partner, significant family members, and health care professionals were significant predictors of success in breastfeeding.

Research consistently showed that support and education were strong motivators for initiation and continuation of breastfeeding. Gill, Reifsnider, and Lucke (2007), and Hannula, Kaunonen, and Tarkka (2008), found a significant increase in initiation and duration of breastfeeding when mothers had support in the form of prenatal education, postpartum telephone calls, and home visits. Gill, Reifsnider, and Lucke (2007), in their qualitative study of 158 mothers, found that mothers who received appropriate support had twice the odds of starting breastfeeding, twice the odds of continuing to breastfeed for 6 months, and only one-half the tendency to quit breastfeeding at any one time.

Hannula, Kaunonen, and Tarkka (2008) found that professional support using varied methods and sites was important to breastfeeding success or failure. They also found that individuality and cultural backgrounds should be considered in providing support.

Encouragement and support to enhance empowerment for the mothers was important, as was peer-support. Spencer, (2008) found the use of a hermeneutic phenomenological approach beneficial to explore breastfeeding from the perspective of the mothers who were experiencing it.

Brodribb, Fallon, Hegney, and O'Brien (2007), in their longitudinal study of 562 Australian mothers, found mother-related reasons (cost, convenience, enjoyment), health effects for the infant (better for baby, prevents allergies, enhanced immunity), moral and family influences (mother breastfed, husband encouragement, the right thing to do, fashionable, mother encouragement), advice from others (mother encouragement, health provider encouragement – either physician or nurse), and convenience as factors supporting breastfeeding. McInnes and Chambers (2008), in their review of qualitative research involving breastfeeding from 1990-2005, found “mother/health care professional relationship, skilled help, time spent with mothers, and medicalization of breastfeeding” as the recurrent themes affecting breastfeeding. They also found that social support, either compatible or incompatible, had impact on breastfeeding initiation.

Similarly, Cricco-Lizza (2005), in her study of 11 Black, non-Hispanic mothers seeking assistance from a large, metropolitan WIC clinic found that personal and caring breastfeeding peer counseling, and practical assistance with breastfeeding (skill development) were very significant in increasing breastfeeding among participants. In her 130 observed interactions with the staff at the WIC clinic, she found personalized, caring behaviors displayed. In her ethnographic study of primiparous African-American or Caribbean-American low-income mothers, she (Cricco-Lizza, 2007) found that the long-term relationships that developed due to the ethnographic approach allowed for trust to develop.

Several studies indicated the importance of education and support to breastfeeding success. Barona-Vilar, Escriba-Aguir, and Ferrero-Gandia (2007) conducted focus group interviews with 19 mothers, followed by in-depth interviews of 12 mothers, in their qualitative study with Italian mothers, and found that most mothers recognized the need for support in breastfeeding. Women from a higher socioeconomic status focused on their partner's opinion and support, while women from a lower socioeconomic status placed more emphasis on professional support. They found that all mothers benefited from seeing breastfeeding in practice. They also found that cultural practices and support were positive factors for gaining information about breastfeeding.

Kools, Thijs, Kester, and de Vries (2006) surveyed 248 mothers at initiation of breastfeeding and followed them at 1, 2, and 3 months postpartum in an effort to determine the factors that impacted breastfeeding continuation. They found a negative association between breastfeeding continuation when there was a lack of social support. There was a positive association with mothers who had a high degree of self-efficacy. The mothers who returned to work were more successful if their employment was part-time rather than full-time.

**Social environment.** Stable, safe lives (Chin & Solomonik, 2009; Flood & Dodgson, 2010; Isabella & Isabella, 1994) were more prevalent in the mothers who successfully breastfeed their babies. Community follow-up (Cramton et al., 2009; Cricco-Lizza, 2007; Kuan et al. 1999) was key to successful continuation of breastfeeding once established in the hospital.

**Culture.** Several studies have found that culture plays a role in breastfeeding success. Sussner, Lindsay, and Peterson (2008) and Celi, Rich-Edwards, Richardson, Kleinman, and Gillman (2005) found that migrant mothers tended to breastfeed soon after immigrating to the U.S. As length of residence increased and English language was adopted, breastfeeding rates

tended to decline. Gibson-Davis and Brooks-Gunn (2006) also had similar findings, and concluded that each year in residence resulted in lowering rates of breastfeeding. Harley, Stamm, and Eskenazi (2007) and Singh, Kogan, and Dee (2007) found that mothers of foreign descent who had lived their entire lives within the United States tended to have lower initiation rates and shorter duration of breastfeeding in comparison to recent immigrants. Pak-Gorstein, Haq, and Graham (2009) discussed cultural practices of breastfeeding mothers, with two perspectives. One was linked to availability of commercial advertisements in the U.S., and the other linked to malnutrition in their home countries leading to the belief that formula-feeding allows mothers to quantify milk ingestion. Jessri, Farmer, and Olson (2012) found that Middle Eastern mothers tended to follow their cultural and religious beliefs about the importance of breastfeeding even after migration.

### **Summary: Facilitators and Barriers to Breastfeeding**

The authors clearly demonstrated variation in demographic characteristics in terms of facilitators and barriers to successful breastfeeding. While some authors found young mothers more likely to breastfeed, others found older mothers more likely to breastfeed. While some authors found higher education a facilitator, others found advanced education a barrier. The authors continued to be divided in terms of culture, income, marital status, ethnicity, being foreign-born, parity, and previous breastfeeding experiences. One study found non-smokers more likely to breastfeed.

Several factors that are related to attitude were found to be facilitators. Time was a facilitator to breastfeeding when the mother was able to invest time to the breastfeeding experience. When health care workers invested time to the mother/baby dyad, breastfeeding was facilitated. Less time, as with increasing work and family obligations, was found to be a barrier

to breastfeeding. Likewise, when health care workers failed to give time, a barrier to successful breastfeeding was created.

Attitudes were formed when mothers had the knowledge they needed to make breastfeeding decisions. When mothers received accurate information from family, peers, health care professionals, and the mass media, breastfeeding was facilitated. When inaccurate and inconsistent information was received from family and health care professionals, a barrier was created.

Mothers were influenced by their beliefs about how others important to them felt about breastfeeding. Mothers felt supported in breastfeeding if they felt family/friends/health care workers believed they should breastfeed. This type of support was received if they had access to or received prenatal care, received face-to-face information sharing, had adequate maternity leave from employers, a close family member or friend who breastfed, and consistent information from family and health care professionals. Active support from these individuals and groups also served as a facilitator. Support following discharge from the hospital was also a facilitator. When mothers perceived the importance of breastfeeding from mother-centered or infant-centered benefits, a positive breastfeeding experience tended to follow. Breastfeeding was also enhanced through positive family influences. Higher income mothers tended to focus on partner's opinions and support; lower income mothers tended to focus on opinions and influence from health care professionals. When sound policies did not exist, inconsistent information from family and health care professionals was received; when mothers felt lack of support from family and friends, and when breastfeeding was "medicalized", barriers were built.

Perceived or actual control over the physical act of breastfeeding served as a facilitator. The authors found that confidence, self-esteem, self-efficacy, self-concept, previous experience

with breastfeeding, feelings of value, competence, positive social environments, knowledge of breastfeeding, access to maternity care, and motivation as strong facilitators for successful breastfeeding. Facilitation of breastfeeding was enhanced when women felt they had stable, safe lives. Barriers were found in mothers who felt vulnerability or lacked the previously discussed characteristics.

### **Consequences of Successful Breastfeeding**

The consequences of successful breastfeeding included infant satiety or satisfaction, maternal comfort and enjoyment, and adequate infant weight gain (Mulder, 2006), overall maternal and infant health (Leff, Gagne, & Jefferis, 1994; Brand, Kothari, & Stark, 2011), and maternal role attainment and lifestyle compatibility (Leff, Gagne, & Jefferis, 1994).

### **Definition of Successful Breastfeeding**

For this research, successful breastfeeding is operationally defined as a reciprocal/symbiotic process, satisfying to both mother and infant, in which mother and infant reap rewards of improved health/well-being, involving the biologic, psychologic, and social aspects necessary to support the process. It begins with initiation of exclusive or predominant breastfeeding at birth, and continues as long as mother/baby find the experience satisfying, for at least six months or longer. It results when maternal confidence, competence, self-esteem/self-concept, time, support from family, friends, and health care professionals, and health care policies work in concert to support breastfeeding.

#### **Biological component**

- Exclusive/full breastfeeding – breastmilk only, either directly from mother’s breast or expressed breastmilk, (except for medications and supplemental water as needed).

- Predominant breastfeeding – combining breast milk with formula or complementary foods, with greater than 50% of feedings from breast milk.
- Infant weight gain follows appropriate growth curve

#### Psychologic component

- Mother and baby are satisfied – mother confident with positive self-esteem; baby calm.

#### Social component

- Support systems are in place and utilized.

### **Definition of Migration**

For this research, migration is operationally defined as a mother transferring their place of residence from Chuuk to Guam within the past five years.

### **Conclusion**

Breastfeeding has been studied around the world, both quantitatively and qualitatively. Many factors impact a mother's decision to initiate and continue breastfeeding. Demographic characteristics, ethnicity, education, support, and motivation are all important components of the breastfeeding decision. When a mother migrates to another geographic region, some of these factors may not be in place to support her to make her infant feeding decision for breastfeeding.

### **Theory of Reasoned Action**

#### **Historically**

The theory of reasoned action was developed in 1965 (Ajzen and Fishbein, 1980). The goal of this theory is to predict, understand, and influence human behavior. Ajzen and Fishbein

(1980) consider that a person's attitudes, or the personal judgment that the behavior is good or bad, combined with subjective norms, or the perception of social pressures by significant people, are the keys to identifying an individuals' intent to perform the proposed behavior. The relative influence of both attitudes and subjective norms influence behavior.

Attitudes are a function of beliefs. Beliefs underlie a person's attitude toward a behavior, or their behavioral beliefs. Subjective norms are also a function of beliefs, but involve one's belief that other people think they should or should not perform a behavior. This is termed normative beliefs, and involves social pressure to perform or not perform a behavior independent of one's own attitude.

External variables are comprised of individual personality, demographics, and socialization. Ajzen and Fishbein (1980) believe that external variables may influence beliefs a person holds or the importance attached to attitudinal and normative beliefs, but only to the extent that it influences the determination of that behavior.

**Behavioral beliefs/Attitudes.** Attitudes are a person's general feeling of the advantages or disadvantages regarding a concept (Ajzen and Fishbein, 1980). An attitude toward a behavior is a person's judgment that performing the behavior is good or bad and that they believe they should or should not perform the behavior. Attitude refers specifically to the person's own performance of the behavior rather than to its performance in general. Attitudes are determined by beliefs about that behavior, and beliefs about the behavior are formed by associating it with various characteristics, qualities, and attributes. Beliefs may result from direct observation of a behavior, they may be acquired indirectly by accepting information from outside sources, or they may be self-generated through inference processes. Salient beliefs are the immediate determinants of the person's attitude.

Attitudes have been extensively studied, and Ajzen and Fishbein (1980) believe that they could be used to explain human action. Their initial work was with uni-dimensional scales, with attitude determined through Thurstone/Likert-type scales that determined the favorable or unfavorable attitude toward a behavior. Later work recognized the contribution of affect, but also cognition (beliefs) and conation (intention), finding a close link between attitude and behavior. Other work found that attitudes may initially predispose one to behave in a manner based on positive or negative beliefs about the behavior. But the behaviors ultimately demonstrated depend on the nature of the reinforcements one receives, and recognition of the multi-component aspect of attitudes. These are comprised of the person's beliefs about the behavior, feelings toward the behavior, and action tendencies with respect to the behavior. This initial work concluded that attitudes alone could not predict behavior. The final approach seemed to focus on the belief that attitude and behavior is moderated by other variables.

**Normative beliefs/Subjective norms.** Normative beliefs, or subjective norms, involve the social environment, or one's perception that most people important to them think they should or should not perform a behavior. It refers to a person's perception, and may not actually reflect what the others think one should do. It has to do more with the individual perception that others who are important to him think he should or should not do something. This guides one to perform or not perform a behavior.

The relative importance of attitudes and subjective norms guides intention, but not necessarily behavior in and of itself. A deeper understanding of the factors influencing behavior requires that we look for the determinants of attitudinal and normative components.

People usually have more information about things that are important to them, and therefore they tend to be more certain of and to have stronger beliefs about behaviors that are

important to them. While some beliefs about performing a behavior may involve a referent, only the person's belief that the referent thinks he should or should not perform the behavior is normative belief.

According to Ajzen and Fishbein (1980), a person's behavior is assumed to be determined by his intention. Intentions are determined by attitudes toward the behavior and subjective norms. Attitudes and subjective norms must be explained in terms of beliefs about the consequences of performing the behavior and about the social expectations of others. Since a person's beliefs represent the information (correct or incorrect) he has about his world, it follows that a person's behavior is ultimately determined by this information.

**External variables.** External variables include personality traits, attitudes toward people or institutions, and demographics (Ajzen and Fishbein, 1980). External variables will be related to behavior only if they are related to one or more of the variables specified in the theory. For instance, demographics such as education may affect 1) salient referents, 2) normative beliefs, and/or 3) motivation to perform or not perform a behavior, although there is no necessary relation between any external variable and a given behavior.

The same can be true for personality traits and behavior. Generally speaking, beliefs reflect a person's past experience. Exposure to different kinds of information leads to the formation of different beliefs (Ajzen and Fishbein, 1980).

Demographic variables and personality variables and traditional attitudes are sometimes viewed as residues of past experiences or are assumed to influence the person's interpretation of his environment and thus the beliefs he holds. External variables are sometimes related to beliefs underlying a given behavior and can provide insight into the factors determining these beliefs and thus by ultimately increasing our understanding of behavior in question. According to the

theory of reasoned action, external variables are not expected to improve prediction of attitudes and subjective norms.

### **Recent Work on the Theory of Reasoned Action**

Fishbein and Ajzen (2010) continue refinement of their theory of reasoned action, believing that behaviors can have profound effects on health and well-being. Their ultimate goals are to further understand the determinants of human behavior, and to contribute to the identification of solutions for personal and social problems that are caused by human behavior.

Behavior follows from information or beliefs that people possess about the behavior under consideration. One acquires this information from a variety of resources such as personal experience, formal and informal education, print and network media, internet, and interactions with family and friends. Demographics can influence the experiences one has and the sources of information, but also the ways that information is interpreted and retained.

As in their previous work, (Ajzen and Fishbein, 1980) behavioral beliefs and normative beliefs formed the basis for intention toward a given behavior. Their recent work has renamed the normative component to normative beliefs/perceived norms, and added perceived behavioral control. Perceived behavioral control involves personal and environmental factors that help or impede their attempts to carry out a behavior, or control beliefs (involving self-efficacy). If more control beliefs facilitate a behavior, there will be higher perceived behavioral control. Attitudes, perceived norms, and perceived behavioral control guide intentions and behavior, leading to behavioral intentions or readiness to perform a behavior.

Lack of requisite skills and abilities, and/or presence of environmental constraints can prevent a person from performing a behavior. One may lack actual control. When one has perceived control over behavioral performance then intention is expected to be a good predictor

of behavior. Intentions are comprised of attitudes, perceived social norms, as well as actual behavioral control (skills, abilities, as well as facilitators and barriers of actual performance), and are important determinants of behavior.

As with the prior model, demographics can potentially influence beliefs, values, group membership, experiences, exposure to experiences and information, social support, and coping. Figure 1 gives a graphic description of the theory of reasoned action. The dotted lines in the model recognize the potential importance these factors may have in influencing behavior. The Reasoned Action Model will be used to guide data collection and analysis for this exploratory, qualitative study.

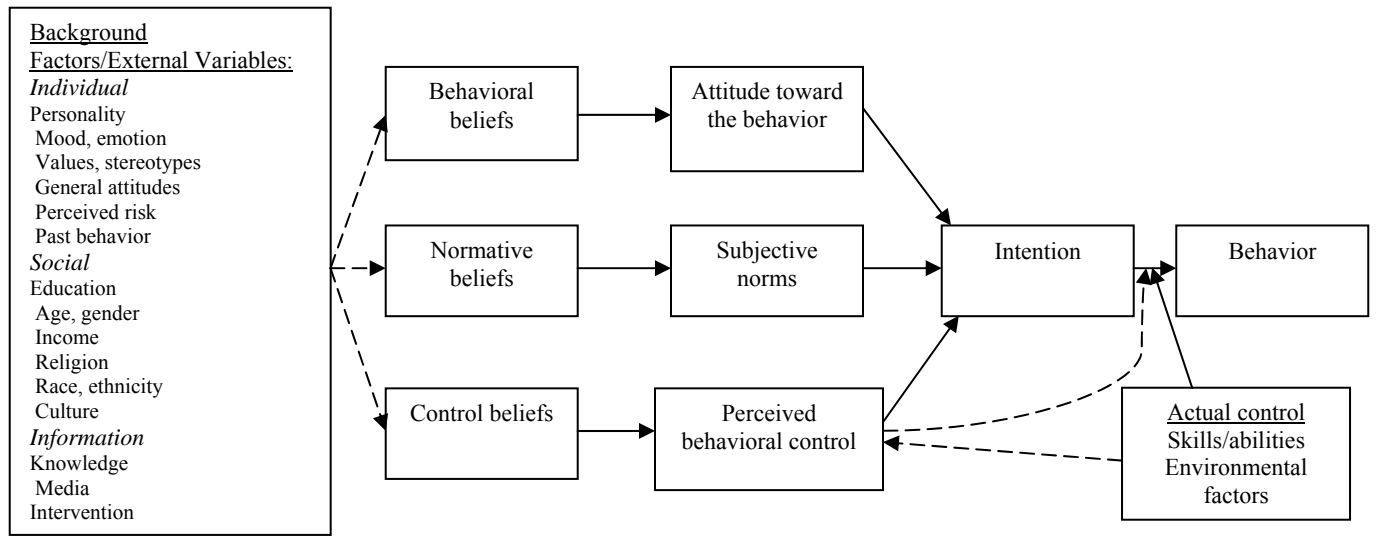


Figure 1. The Reasoned Action Model (2010)

### Theory of Reasoned Action Relevant to Breastfeeding Intention and Behavior

The theory of reasoned action has been successfully used in breastfeeding research. Swanson, Power, Kaur, Carter, and Shepherd (2006), used the theory of reasoned action in their study to determine how knowledge and social influences predicted breastfeeding behavior among adolescents in Scotland. DiGirolamo, Thompson, Martorell, Fein, and Grummer-Strawn (2005) examined the effects of prenatal intention and initial breastfeeding experiences on breastfeeding initiation and duration using the theory of reasoned action in the U.S. Anchondo, et al. (2012) investigated physician’s experiences with and attitudes towards breastfeeding using both the theory of reasoned action and the health belief model in a university-based hospital on the U.S./Mexico border. They found the theory of reasoned action supported prediction of intent, but needed to address initial experience when predicting maintenance of breastfeeding.

While these studies have successfully used the theory of reasoned action among mothers and health care providers around the world, no studies have been identified that have addressed

breastfeeding in the USAPI using this model. The theory of reasoned action will be used to gain a better understanding of breastfeeding among migrant Chuukese women living on Guam.

### **CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY**

The purpose of this research was to determine the facilitators and barriers to successful breastfeeding among Chuukese migrant mothers living on Guam. The outcome of this research provides information describing mothers most likely to breastfeed their babies, and allows health care teams within the USAPI to actively promote breastfeeding. With the knowledge gained from this research, breastfeeding promotion activities can be developed to increase awareness of the importance of breastfeeding, target support activities, and potentially develop regional breastfeeding policies to help motivate mothers to breastfeed their babies, thus improving breastfeeding rates over time.

#### **Method**

##### **Background of Method Used**

Because so little is known about breastfeeding patterns in women from Chuuk, FSM who migrate to Guam, the theory of reasoned action was used to guide this exploratory, qualitative study to gain a better understanding of the facilitators and barriers to breastfeeding among this group of migrants. Sandelowski (2000) describes qualitative descriptive studies as the method of choice when straightforward descriptions of phenomena are preferred, and also notes that qualitative descriptive studies are “one of the most frequently employed methodological approaches in the practice disciplines” (p. 335). She differentiates qualitative description methodology from other descriptive studies such as phenomenology, grounded theory, and ethnography, while acknowledging that all qualitative methodologies have some characteristics in common. Qualitative description involves the arrangement of the facts in everyday words, offering an inclusive summary of an event in everyday vocabulary. According to Sandelowski (2000), researchers using qualitative description stay closer to their data than researchers using

other qualitative methods. Qualitative description continues to be recognized (Sandelowski, 2010) for its value “in the knowledge its use can produce, but also as a vehicle for presenting and treating research methods as living entities that resist simple classification”. (p. 77).

**Method Overview**

Focus group interviews and key informant interviews were conducted to determine the facilitators and barriers to successful breastfeeding among mothers on Guam. Methodology included work as documented by Morgan (1997) and Krueger and Casey (2009) which guided the focus group methodology.

Methodology included development and validation of the survey and focus group forms, cognitive testing of the forms with Chuukese mothers, pilot testing of the demographic data tools and interview guide questions, nine (9) key informant interviews, one (1) pilot focus group, five (5) focus group interviews, and one final validation focus group. This study included twenty-seven (27) participants. Table 7 summarizes the methodology for the study.

Table 7: Summary of Methodology

Task	Participants
Content validity of interview guide questions	Review by 5 experts in maternal-child health.
Cognitive testing of interview guide questions	Review/interview with 3 Chuukese women.
Pilot test (n=1) for both demographic data tool and interview guide questions	One initial focus group with 4 mothers who met eligibility criteria to ensure that tools were appropriate and represented the theory of reasoned action. No changes were made following the pilot test.
Key informant interviews (n=9) (3 healthcare providers; 3 breastfeeding mothers, and 3 formula feeding mothers)	Three (3) interviews each of a) health care professionals; b) Chuukese migrants who breastfed in Guam; c) Chuukese migrants who formula/mix-fed in Guam.
Focus group interviews (n=7) (3 breast feeding mothers and 3 formula feeding mothers and 1 final validation focus group which contained breastfeeding and formula feeding mothers)	All participants were Chuukese mothers who met the inclusion criteria; there were 18 participants, 8 were breastfeeding and 10 were formula feeding.

**Focus Group and Key Informant Interview Guide.** The two tools that were developed for the study (demographic data tool and interview guide tool) were guided by the theory of reasoned action. The Infant Feeding Demographic Data Tool (consisted of eight (8) questions for key informant participants, and expanded to twenty-seven (27) questions for focus group participants) was used to determine the demographic characteristics of the participants. The Guam Infant Feeding Key Informant/Focus Group Interview Guide Tool consisted of eight (8) questions, based on key concepts from the theory of reasoned action and was used for both key informant and focus group participants. Assessment scales are found in Appendix B. Table 8 indicates how the questions in the tools are related to the theory of reasoned action.

Table 8: Tools as Guided by Theory of Reasoned Action

Category	Infant Feeding Demographic Data Tool	Guam Infant Feeding Key Informant/Focus Group Interview Guide Tool
Background Factors	X	
Behavioral Beliefs		Question 1
Attitude		Question 2
Normative Beliefs		Question 3
Subjective Norms		Question 4
Control Beliefs		Question 5
Perceived Behavioral Control		Question 6
Intention		Question 7
Summary		Question 8

**Validity Assurance.** To assure content validity, the Infant Feeding Demographic Data Survey Form and the Guam Infant Feeding Focus Group Interview Guide were given to a panel of five experts in maternal-child health for review. Revisions to the forms, mainly simplification of grammar, were made based on recommendations from the expert panel.

In addition, to ensure understandability of the questions, cognitive testing was completed. The researcher sat with three Chuukese mothers, and read each individual question aloud, and

asked “What does the question mean to each of you?” When it was apparent that the meaning of the question was not clear to the participants, the question was reworded until the intent was unambiguous to the group.

**Research Team.** The research team consisted of the researcher and a co-facilitator during each encounter. The researcher served as the moderator, and the co-facilitator took notes on the responses, clarified key points to participants as necessary, and summarized the key points of the conversation. The co-facilitators were native Chuukese women who are fluent in both Chuukese and English. To support a successful focus group, the research team arrived at the assigned meeting place 15-20 minutes prior to the start of the session. This time was used to set up necessary equipment, and to arrange the room. During the actual focus group session, the moderator posed questions to the participants, and took brief notes on their responses. The moderator trained the co-facilitators in the specifics of focus group research.

**Criteria for Inclusion or Exclusion in Study.** Inclusion criteria for the health care professionals for key informant interview (nurse, nutritionist, and community health worker) were: at least two years of experience which included providing maternal child care services to Chuukese women, at least 18 years of age, and spoke English to the extent required for full participation in the project. Exclusion criteria were health care professionals who were younger than 18, had not had experience with providing maternal child care to Chuukese women, and/or did not speak English to the extent required for full participation in the project.

Inclusion criteria for the mothers interviewed (either key informant or focus group interviews) included Chuukese mothers who spoke English to the extent that they could understand the consent and engage in the discussions of the key informant interviews and focus groups, had migrated to Guam from Chuuk within the last 5 years, were at least eighteen years of

age, had delivered a baby in Guam, and were willing and able to participate. Exclusion criteria were mothers who were younger than 18 years, had not delivered a baby in Guam, did not migrate to Guam from Chuuk, and/or did not speak English to the extent required for full participation.

**Recruitment of Participants.** Participants for the key informant interviews (n=9) were recruited from members of the health care community on Guam, and Chuukese mothers who met inclusion criteria. The participants were identified as experts in breastfeeding from within the health care community, and from mothers who attended public health clinics.

Participants for the focus groups (pilot focus group [1]; focus groups [5]; and final validation focus group [1]) were solicited using fliers posted at clinics, Chuukese churches, and other public places, as well as from discussions with health care providers giving care to women and children. A snow-ball technique was also used, with additional participants identified from family members and friends.

**Facilities and Layout for Key Informant and Focus Group Interviews.** A small, quiet room was used for the key informant and focus group sessions. Key informant interviews took place in a location agreed upon by the key informant and researcher. The health care providers were interviewed at their work site. Mothers were interviewed in their homes, or a location where they were comfortable to meet. Time and date matched the individual key informants' work or personal schedule.

Focus groups were held in a location that was easily accessible to both the participants and the research team, including homes, churches, and community meeting rooms. The participants and the research team sat together. The tape recorder (and back up tape recorder) was set up in the center of the room.

**Study Participants.** The participants in the study included: maternal-child healthcare workers from Guam, and Chuukese migrant mothers who had delivered infants on Guam. A total of 27 participants were interviewed.

**Pilot Testing.** An initial focus group session was conducted to pilot test the layout, format, and questions. This focus group pilot study included participation from four mothers who met eligibility criteria.

**Conducting the Focus Groups and Key Informant Interviews.** Nine (9) key informant interviews and a total of nine (9) focus groups were completed. The description of these interviews follows.

*Key informant interviews.* After identifying potential participants, the researcher scheduled the key informant interviews based on convenience of the participants. The procedures were explained to the participants, and included signing an informed consent document. Upon agreeing to participate, a consent form was given to each participant. The researcher slowly read the consent form to participants, paused at the end of each section for questions, and ensured understanding of the consent form prior to obtaining signatures. Each interview took place in a quiet relaxing room that was equipped with drinks for comfort. Participants were welcomed to the key informant interview, and an overview of the topic was given. Ground rules were given.

Prior to beginning the key informant interview, the researcher asked the mothers to complete the demographic data tool (Appendix B), the researcher went over the informed consent and confidentiality document (Appendix C) and answered any questions. The researcher informed the participants that the interview would be recorded and that all data collected would

be considered confidential. The mothers were asked a series of open-ended questions that pertained to their breastfeeding experience.

The research team conducted each key informant interview. The research assistant helped with interpretation of the comments during the key informant interviews.

Nine (9) key informant interviews were conducted. The key informant interviews were completed first, to further refine the focus group discussion topics. The key informants who were health care workers (n=3) were completed first. One key informant was a nurse who is also an international board certified lactation consultant (IBCLC); the second key informant was a nutritionist who is a lactation consultant; the third key informant was Chuukese community health worker. All health care workers had a history of working with Chuukese mothers for many years. Interviews with the health care workers were conducted in their work setting at a time that was convenient for them.

Breastfeeding mothers (n=3) were interviewed next. Three breastfeeding mothers who met inclusion criteria were identified through the Guam Department of Public Health and Social Services and by word-of-mouth. Mothers were interviewed in their homes.

Formula/mix-feeding mothers (n=3) were interviewed last. Three formula/mix-feeding mothers who met inclusion criteria were identified through the Guam Department of Public Health and Social Services and by word-of-mouth. Mothers were interviewed at Public Health and in their homes. The information obtained from the nine key informant interviews guided focus group interviews. After the nine (9) key informant interviews were held, it was found that the items in the Interview Guide were appropriate and inclusive enough to address all the concepts of the theory of reasoned action. Therefore, the Interview Guide was used for the focus groups.

*Focus group interviews.* After identifying potential participants, the researcher scheduled the focus groups, based on convenience of the participants. The procedures were explained to the participants, and included signing an informed consent document. Upon agreeing to participate, a consent form was given to each participant. The researcher slowly read the consent form to participants, paused at the end of each section for questions, and ensured understanding of the consent form prior to obtaining signatures. Each interview and focus group interview took place in a quiet relaxing room that was equipped with drinks for comfort. Participants were welcomed to the focus group, and an overview of the topic was given. Ground rules were given.

Prior to beginning the focus group, the researcher asked the mothers to complete the demographic data tool (Appendix B), the researcher went over the informed consent and confidentiality document (Appendix C) and answered any questions. The researcher informed the participants that the interview would be recorded and that all data collected would be considered confidential. The mothers were asked a series of open-ended questions that pertained to their breastfeeding experience.

Notes were taken during the session. The researcher and assistant took notes. Codes were used to identify speakers and the key ideas offered. Bulleted notes that summarized key concepts or points made by participants were also recorded on newsprint hung in the front of the group to allow quality control and on-site feedback and verification to ensure accuracy of note taking. The research team conducted each focus group session. The research assistant helped with interpretation of the comments during both the key informant and focus group interviews.

A total of seven (7) focus groups were completed (pilot group [1]; focus group [5]; and final validation focus group [1]). Focus group participants included Chuukese women who had migrated to Guam and subsequently delivered a baby while in Guam. Eight (8) of the focus group participants included mothers who breastfeed their infant, while ten (10) of the focus group participants included mothers who gave formula to their babies, either exclusively, or in combination with breastfeeding.

*Pilot focus group (n=1).* The initial focus group was the pilot test, as described above. That focus group took place in a community meeting room at a central location on Guam. Four breastfeeding mothers participated who met inclusion criteria. No changes were made to the focus group script and the remaining focus groups proceeded as planned.

*Focus groups (n=5).* Focus groups followed until saturation was achieved. (Two (2) were breast feeding mothers, and three (3) were formula/mix feeding mothers). These focus groups took place at various locations on Guam, including churches, housing areas, and private homes. Two to four mothers who met inclusion criteria participated in each focus group. Saturation was reached after the five additional focus groups. In total, six focus groups were conducted (3 breastfeeding mothers and 3 formula/mix feeding mothers).

*Validation Focus Group Interview.* After saturation was achieved, the data from the six focus groups were reviewed. Following this initial analysis, the final validation focus group was completed. The final focus group was used to validate and confirm findings from prior groups. Two mothers participated, and met in an agreed upon housing area in central Guam. The validation focus group contained one mother who breastfed and one mother who mix-fed. Mothers were asked the same questions used in previous focus groups, and then

afterwards were informed how previous mothers had responded. Their responses were consistent with the prior focus groups and they indicated agreement with the previous findings.

### **Protection of Human Subjects**

Institutional Review Board (IRB) approval from the University of Hawaii was obtained prior to initiating the study. As the researcher is an employee of the University of Guam, IRB approval was also obtained from the University of Guam. When changes were made at any point in the study, approval was again obtained.

The risk of loss of privacy was addressed by keeping the informed consents and confidentiality agreements in a locked file accessible only to the researcher. Codes were assigned for each individual participating in the interviews and records of the observations were kept separately from the informed consents.

To protect against psychological risks, participants were told the following: 1) their participation in the study was entirely voluntary; 2) they were free to refuse to participate and to withdraw from the study or any portion of the study; and 3) they had the right not to answer any question they felt uncomfortable with. At the conclusion of the project and analysis of the data, findings were reported. Only codes were used to identify the content of the interviews of an individual family.

The field notes were kept in a locked file. The participants were assured that they would not be identified in any way in any publication of the study. Potential risks to the subjects were identified as personal feelings of inadequacy due to problems with breastfeeding their baby. However, no participants indicated any negative effects. The benefits include gaining knowledge to assist in improving breastfeeding rates among infants and children on Guam.

### **Data Analysis Process**

Demographic Data: Data from the demographic data tool was comprised of descriptive quantitative data. This data was entered into the Statistical Package for the Social Sciences (SPSS). Descriptive statistics were used to describe the participants.

Qualitative Data: Qualitative research requires collaboration between the research and the participants to ensure trustworthiness of the findings. Graneheim and Lundman (2004) describe the concepts relevant to data analysis in qualitative research, which includes manifest and latent content, meaning units, condensed meaning unit, abstracting, content area, code, category and theme. Manifest and latent content derived from the interviews formed the basis for analysis. Manifest content refers to the obvious components identified in the data. Latent content refers to interpretation of the data, thereby deriving meaning from the text. The meaning unit comprises the related words or statements made by participants. The meaning units were then condensed to shorten the statements, while still preserving the basic unit. These condensed statements were further refined to arrive at codes, categories and themes. To use this process, the interviews were tape recorded and reviewed several times by the researcher to gain a perspective of what was being stated. Initial analysis coding was done by the researcher, and then reviewed by one Chuukese research assistant who is a nursing student born and raised in Chuuk, and one University of Hawaii faculty member who is familiar with qualitative research and the Chuukese culture. Where the reviewers were not in full agreement with the coding, discussion occurred until full agreement was achieved. In the end, the three reviewers agreed that the data analysis process was complete.

Credibility was established by the researchers by verifying the analysis outcomes with the final participant focus group. This assured that the results of the research were believable from the perspective of the participants in the research.

This method of data analysis aimed to achieve trustworthiness in terms of credibility, dependability, and transferability. Credibility refers to the confidence that the data and analysis addresses the focus of the study. Dependability refers to the degree to which the researcher decisions affect the analysis process. Transferability refers to the extent that the findings can be transferred to other settings or groups, and involves the reader's decision making in this regard. Attention to these three concepts assured trustworthiness.

## **CHAPTER 4: PRESENTATION OF FINDINGS**

Breastfeeding has long been identified as a key measure to ensure infant health and well-being. In spite of this, trends have indicated that breastfeeding has been replaced or supplemented by commercial formula by many mothers. Limited information is available regarding the facilitators and barriers to successful breastfeeding on Guam. No information exists regarding breastfeeding experiences of migrant Chuukese mothers on Guam, a population that traditionally breastfeed their babies. This study sought to identify the facilitators and barriers to breastfeeding among migrant Chuukese mothers on Guam. Key informant and focus group interviews were conducted. Specific findings of the key informant and focus group interviews are presented.

### **Key Informant Interviews**

Key informant interviews were conducted with nine (9) participants. Demographic data and responses to guided questions in the interviews were collected. The findings from the key informant interviews follow.

**Demographic Findings from Key Informant Interviews.** Three health care workers were interviewed as key informants. They included one nurse who is an IBCLC, one WIC nutritionist and certified lactation consultant, and one community health worker. All key informants were female; one was Caucasian, one Filipino; one Chuukese. The healthcare workers had a mean age of 52 years (range 50-54 years). All three were married; two lived in the northern part of Guam, one lived in the south. One originated from a Chuuk lagoon island (Uman). They had lived an average of 19 years on Guam (range 13-23.75 years). One held an associate degree; two held baccalaureate degrees. Two reported annual incomes above \$50,000; one reported an income of \$10-20,000.

Three Chuukese breastfeeding mothers were also key informants. They had a mean age of 28 years (range 26-30 years). One was single, one was married, and one was living with their significant other. All originated from Chuuk lagoon islands (Tol, Uman, and Moch), but two currently live in central Guam, and the other currently lives in southern Guam. They have lived on Guam an average of 2 years (range 1-3 years). Two had completed high school, one had an associate degree. Two reported incomes below \$10,000; one indicated the income was unknown.

Three Chuukese formula/mix-feeding mothers also served as key informants. They had a mean age of 23 years (range 19-26 years). Two were single; one was married. Also from Chuuk lagoon islands (Uman, Weno, and Fefan), they currently live in northern, central, and southern Guam. They have lived on Guam an average of 4 years (range 3-5 years). All had less than high school education. Like the breastfeeding mothers, two reported incomes below \$10,000; one indicated the income was unknown.

**Interview findings from key informant interviews.** Some variation was found among the three groups. However, the key themes that emerged from these three groups were consistent with the theory of reasoned action. The findings are reported here.

Key informant interviews consisted of three each from health care providers, Chuukese migrant mothers who breastfed their babies, and Chuukese migrant mothers who either formula or mix-fed their babies. The key informants provided a personal perspective on breastfeeding on Guam. The findings are reported here. Table 9 summarizes key informant interviews with all nine key informants. Since the key informant interview findings for the mothers complemented the findings from the focus group interviews, those findings will be reported jointly in the focus group section.

*Behavioral beliefs/Attitude.* Behavioral beliefs result from direct observations or experiences and influences the mother has had. Attitudes involve the general feeling mothers have about the advantages and disadvantages of breastfeeding. The health care provider key informants had five themes related to behavioral beliefs and attitude: 1) knowledge acquisition from a trusted person, 2) traditional values, 3) mixed messages, 4) attitude shaping, and 5) cultural conflict/social change.

All participants agreed that mothers receive their knowledge almost exclusively from word of mouth interactions with others. The maternal grandmother is a key person in the life of the mother, and has much influence. When mothers are given the correct information about breastfeeding, they are able to form positive attitudes about breastfeeding. These all serve as facilitators for breastfeeding.

Another key informant indicated that breastfeeding is very good for the baby, and believes that breastfed babies rarely get sick, do not get into trouble, and maintain close ties to their mother for 20-30 years. She indicates that back home in Chuuk where there is no WIC, most cannot afford formula. She states, “In our culture, if you breastfeed, you are a good mother.”

However, barriers were also present. One key informant pointed out that mixed messages are received when mothers are taught that breastfeeding is best, but are given formula. Another barrier presents when mothers migrate to Guam. Even if they have been exposed to breastfeeding in Chuuk, (or even breastfed a baby before), the new environment on Guam entices mothers to try to fit in. They formula feed to appear more “Americanized”.

Another key informant indicated that cultural conflict and social change has altered the way breastfeeding is practiced. She stated that the new generation has lost, in her opinion, the

essence of patience. They want everything instantly, and that formula is the new fast food for the baby.

*Normative beliefs/Subjective norms.* Normative beliefs and subjective norms involve the mother's perception of what her most trusted confidants think she should or should not do. It may not reflect reality, but does guide breastfeeding behavior. These include the mother's perception of how people close to her think she should feed her baby. Normative beliefs and subjective norms focused on three main themes: 1) cultural conflict/social change, 2) family support, and 3) mixed messages.

The health care worker key informants believed that family support was the key facilitator. Family is very important in the Chuukese culture, and mothers who believed that they were meeting family expectations breastfed their babies. To Chuukese mothers, if you breastfeed, you are a good mother.

There were also barriers to successful breastfeeding. Cultural conflict/social change was a barrier. If mothers wanted to acclimate to Guam, one health care worker key informant indicated the mother would not choose to breastfeed. In this way, the mother has a choice to make – to follow her traditional roots, or to follow what she believes to be the acceptable way to feed babies on Guam. While the family has much influence over the mother, another health care worker key informant indicated that if the mother believed that the family wanted WIC support they would formula feed. For them, feeding formula requires money, so being seen giving formula indicates a higher economic status.

*Control beliefs/Perceived behavioral control.* Control beliefs and perceived behavioral control influence a mother's success with breastfeeding. When mothers have a high level of perceived control, intention to breastfeed will follow. The health care worker key

informants indicated five themes here: 1) family support, 2) traditional values and beliefs, 3) lack of support, 4) mixed messages, and 5) cultural conflict/Social change.

Family support and traditional values and beliefs were the two facilitators identified by the health care worker key informants. They acknowledged that when the mother received positive encouragement and resources from the maternal grandmother and mother's social circle, they felt supported and breastfeeding would result. They also acknowledged the convenience of breastfeeding and the cost savings were very much facilitators of breastfeeding.

They identified many barriers with regard to control and perceived control. When mothers felt a lack of support from the health care system, they lost their sense of control. One health care worker key informant indicated that Chuukese mothers do not tend to ask health care workers for assistance if a problem is present. If no one from health care interacts with the mothers as breastfeeding is being initiated and maintained, mothers may fail to breastfeed due to lack of perceived control.

One health care worker key informant indicated her disappointment that lack of breastfeeding support from health care and family make breastfeeding more difficult than it needs to be. She expressed the desire that more mothers could be reached, that there be no stigmas, and more mother-to-mother support for breastfeeding could be found. She wished that others could catch her passion for breastfeeding.

The act by WIC of providing formula to mothers for their babies sends mixed messages to mothers that they may need to give supplementation to babies, that their milk is not adequate. This challenges the mother's perception of her control over breastfeeding success.

The cultural conflict/social change that young mothers experience when they migrate to Guam challenges their perception of control. Also considered is whether or not they want to fit the cultural norm to formula feed that they perceive is present on Guam.

***Intention.*** Intent is formed from behavioral beliefs, normative beliefs, and feelings of control. There were mixed views from the health care workers. Two workers believed that traditional values and beliefs support long-term breastfeeding. They believed that mothers would breastfeed for 2 years or more. They viewed this as a facilitator. The other key informant believed that cultural conflict and social change would result in mix-feeding their babies. This was viewed as a barrier.

**Table 9 Summary of Key Informant Interviews**

<b>Health Care Workers</b>					
<b>Meaning unit</b>	<b>Condensed meaning unit (Description close to the text)</b>	<b>Condensed meaning unit (Interpretation of the underlying meaning)</b>	<b>Sub-theme (threads of meaning running through condensed text)</b>	<b>Theme</b>	<b>Impact on Breastfeeding</b>
<b>Behavioral Beliefs</b>					
Breastfeeding is best. Evidence based research shows that breastfeeding is best. Sharing that information is important.	Breastfeeding is better than formula.	Person to person sharing of knowledge is important.	Behavioral beliefs are shaped from knowledge gained from a trusted person.	Knowledge guides breastfeeding practice.	Facilitator
Chuukese mothers gain knowledge from others by word of mouth.	Mothers are comfortable receiving information from others.				
Maternal grandmother is key to passing on information about breastfeeding. She speaks the language, and knows the customs.	Mothers are more comfortable with their mothers.				
WIC provides one to one counseling and teaching about breastfeeding, but they give formula	WIC teaches that breastfeeding is best, but gives formula.	Mothers receive mixed messages from WIC.	Mixed messages confuse mother's behavioral beliefs.	Mixed messages result in formula use.	Barrier
<b>Attitude</b>					
How a baby is fed is very important. Breastfeeding is best. Bonding, hormones, emotional development, health are all supported by breastfeeding.	Breastfeeding is important in many different aspects.	Breastfeeding is best for baby.	Attitude shaping – forming positive attitudes about breastfeeding	Attitude shaping - advantages to breastfeeding leads to successful breastfeeding	Facilitator
If moms have breastfed before, they know it is best. But on Guam, they will formula feed if they think it's more acceptable here.	Moms reshape their values to fit in.	There are social and generational changes occurring with mothers. They want to fit in to Guam.	Attitudes change when exposed to new cultural values and beliefs	Cultural conflict/ Social change challenge attitudes about breastfeeding.	Barrier
Breastfeeding is very important to health. Babies who are breastfed grow up to show respect for their mother. But he young will formula feed, especially if in public. The parents care for the baby.	Generational changes are happening.				
On Guam, they will do both breast and formula feeding. They want to fit in, be American/Guamanian. They want to be accepted. They won't breastfeed in public.	Mothers reshape their values to fit in.				
The new generation has lost the essence of patience. They want everything instantly. Formula is the new fast food.	There is much change occurring with the younger mothers.				
Breastfeeding is very good for the baby compared to formula. Breastfed babies are	Breastfeeding is the expectation in Chuukese	When breastfeeding is supported, positive outcomes	Traditional values and beliefs foster	Traditional values in Chuuk	Facilitator

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hardly sick, do not get in trouble, and mom still has control after 20-30 years. Breastfed children have a more positive attitude towards parents. Western life most don't like to breastfeed. Back home in Chuuk, we don't have WIC, we can't afford milk. In our culture, if you breastfeed, you are a good mother.	families.	are achieved.	continued breastfeeding.	support breastfeeding.	
<b>Normative Beliefs</b>					
If the mother is acclimating to society, she will formula feed. If she is maintaining a familiar societal way, she will breastfeed.	The mother has to choose to follow traditional ways or follow what she believes to be acceptable ways of Guam.	There is conflict between family and adaptation to Guam.	Normative beliefs are challenged when exposed to differing views between family and the new culture/society	Cultural conflict/ Social change challenge the feeding decision.	Barrier
The family has much influence over the mother. They will encourage her to tell WIC they are formula feeding so they can get formula and show higher status.	For some family members, formula feeding shows status. The baby is more Americanized.	Families also struggle with the changes in Guam. Formula shows status – they have money.			
If you breastfeed your baby, you are a good mother. The family will support the breastfeeding mother by giving good food for mom to eat.	Breastfeeding is best.	The family supports breastfeeding.	When the mother believes her family supports breastfeeding, successful breastfeeding is achieved	Family support fosters breastfeeding.	Facilitator
<b>Subjective Norms</b>					
The family is very important to the mother, and strongly influences the mother's beliefs. Families believe that breastfeeding is best.	The family is key to the mother's decision making.	Mother's follow family guidance.	Mothers want to follow the guidance of others important to them.	Family support guides mother's decision making.	Facilitator
The family has a strong influence over the mother. Even if they think breastfeeding is best, they may encourage formula feeding for status.	The family is key to the mother's decision making, and may influence formula feeding to acclimate to Guam.		Mothers want to follow the guidance of others important to them, and struggle when mixed messages are received.	Mixed messages confuse mother's decision making.	Barrier
<b>Control Beliefs</b>					
Mother and social circle provide support and build confidence. Positive encouragement and resources facilitate breastfeeding.	This support allows mom to feel confident that she can be successful at breastfeeding.	Support and education make breastfeeding easier.	Traditional family support for breastfeeding allows mothers to feel control of their own decision making.	Family support allows mothers to feel control and confidence and will succeed at breastfeeding..	Facilitator
Finances make breastfeeding easy. Convenient – no milk, bottles, brushes to buy. Easy to BF before and after work. Breastfeeding is natural.	Breastfeeding is convenient and economical. It is easy to breastfeed.	Support and education make breastfeeding easier.	When mothers weigh the advantages to breastfeeding, they feel control.	Traditional values and beliefs foster breastfeeding.	
Hospital policies do not support breastfeeding. Public policies and doctors do not always facilitate breastfeeding.	If mother does not feel support, or has inaccurate information, lack of confidence, she will	Health care policies and practices are not supportive of breastfeeding.	When health care policies and practices do not support	Lack of support from health care challenges	Barrier

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	have a hard time breastfeeding.		breastfeeding, mothers do not feel control.	mothers' control and leads to formula use.	
Mothers who breastfeed are tired. They have to get up at night to feed the baby.	When mom breastfeeds, she is the only one who can attend to the baby for feeding.	Breastfeeding has challenges.	When mothers do not feel support, they lack control.	Lack of support from family challenges breastfeeding success.	
<b>Perceived Behavioral Control</b>					
Breastfeeding can be challenging. It is a new skill to be learned. Mothers may not ask for help if there is a problem. Chuukese mothers do not usually have a home visit or call after discharge. They give up breastfeeding if there is a problem. They don't ask for help.	When a problem is encountered, the mom may not ask for help or know how to access help. Chuukese mothers may not have access to support if a problem arises.	Breastfeeding can be challenging. If no one checks on the mother to ensure breastfeeding is going well, breastfeeding may fail.	The mother's perception of control is challenged when problems present.	Lack of support from trusted family and health care leads to formula use.	Barrier
Even though WIC consistently says to breastfeed, they give formula to the mothers.	Mothers receive conflicting information from health care providers.	Health care messages are inconsistent.	The mother's perception of control is challenged when mixed messages are received.	Mixed messages make perceived control difficult and leads to formula use.	
Breastfeeding is easy and natural. It is part of the Chuukese cultural. The new generation doesn't follow the culture all the time.	Breastfeeding is traditional in Chuuk.	The younger generation struggles with tradition and exposure to new ways.	The mother's perception of control is conflicted when trying to fit in to the new culture/society.	Cultural conflict/ Social change tests perceived control and leads to formula use.	
Wish more mothers could be reached at whatever level they are at. Wish there were no stigmas, more woman to woman support. Wish others would catch the passion. Breastfeeding contributes to the circle of life.	Some health care workers are passionate about breastfeeding support.	Breastfeeding support is needed.	Breastfeeding must be supported by family, friends, and health care staff in order to assist mothers to be successful at breastfeeding.	Lack of support from health care and family make breastfeeding difficult.	Barrier
<b>Intention</b>					
Chuukese mothers intend to breastfeed for 2 years or more.	Chuukese mothers will breastfeed.	Chuukese mothers follow tradition.	Mothers who follow traditional values intend to breastfeed for 2 years or more.	Traditional values and beliefs support long-term breastfeeding.	Facilitator
Chuukese mothers set a breastfeeding goal of 1 month. They want formula.	Chuukese mothers will mix feed.	Chuukese mothers are changing their traditional ways.	Cultural and social changes have altered the tradition of breastfeeding.	Cultural conflict/ Social change challenge long-term breastfeeding.	Barrier

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<b>Breastfeeding Mothers</b>					
<b>Meaning unit</b>	<b>Condensed meaning unit (Description close to the text)</b>	<b>Condensed meaning unit (Interpretation of the underlying meaning)</b>	<b>Sub-theme (threads of meaning running through condensed text)</b>	<b>Theme</b>	<b>Impact on Breastfeeding</b>
<b>Behavioral Beliefs</b>					
Breastfeeding is best. Knowledge is gained from each other by word of mouth, from doctors, nurses, and family.	Talking is the best way to relay information. Doctors and nurses are educated; parents and friends are easy to talk to.	Person to person sharing of knowledge is important.	Behavioral beliefs are shaped from contact with a trusted person.	Knowledge acquisition from a trusted person leads to breastfeeding success.	Facilitator
Breastfeeding is best. Written materials from the clinic and internet are also useful.	Written information allows mothers time to process information at home.	Written materials are helpful to some mothers.	Behavioral beliefs are also shaped from written information.	Knowledge acquisition from trusted sources leads to breastfeeding success.	
<b>Attitude</b>					
Breastfeeding is so important that breastfeeding in public is acceptable. Mothers who have had several children are comfortable with that. New mothers are shy.	Breastfeeding is so important, many mothers will breastfeed in public on Guam	Breastfeeding is very important.	Positive attitudes are formed when traditional values are in place.	Traditional values shape attitudes and lead to successful breastfeeding.	Facilitator
<b>Normative Beliefs</b>					
Families expect mothers to breastfeed their babies.	Families advocate breastfeeding.	Families want their babies to be breastfed.	When the mother believes her family supports breastfeeding, successful breastfeeding is achieved.	Traditional values lead to successful breastfeeding	Facilitator
Families expect breastfeeding, but will give formula if mother is working.	Families advocate for breastfeeding, but support formula supplementation if mother is working.	Mix feeding is acceptable for working mothers.	Normative beliefs are challenged when exposed to differing needs between family and the new culture/society.	Cultural conflict/ Social change challenge beliefs and lead to formula use.	Barrier
<b>Subjective Norms</b>					
Mothers consider what family and friends think, but in the end they make their own decisions.	It is a traditional expectation that mother's breastfeed their babies. Mothers are beginning to be independent of family values.	Mothers are making their own decisions.	As mothers adapt to changes in society, the way decisions are made change.	Cultural conflict/ Social change alters traditional decision making.	Barrier
<b>Control Beliefs</b>					
Breastfeeding is easy. Friends and family help to cook and do household chores. That helps	Family and friends help with other chores to allow time for	Family and friends support breastfeeding.	Control in breastfeeding is	Family support empowers	Facilitator

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with breastfeeding.	breastfeeding.		facilitated when family and friends assist with household chores.	control in the mother's ability to breastfeed.	
Breastfeeding is easy. Don't have to pay for milk.	Breastfeeding is easy, and there are financial advantages to breastfeeding.	Breastfeeding is easy and economics make mothers feel control.	When mothers weigh the advantages to breastfeeding, they feel control.	Traditional values and beliefs foster breastfeeding.	
<b>Perceived Behavioral Control</b>					
Breastfeeding is easy. If there were problems, talk to family first; then doctor. Family (maternal grandmother and father of the baby) encouraging.	Breastfeeding is easy. Families can give advice if there is a problem. Doctors can too.	Family support helps through challenges with breastfeeding.	When mothers feel support from family, they feel control over breastfeeding	Family support allows mothers to feel in control to breastfeed.	Facilitator
<b>Intention</b>					
Babies are breastfed until 8 months to one year, or until mother looks for a job. When they start to eat, then combine food with breastmilk.	Mothers plan to exclusively breastfeed until solid foods are introduced.	Mom and baby control the length of breastfeeding.	Intent to achieve long-term breastfeeding is facilitated by traditional values and beliefs	Traditional values support extended breastfeeding intent.	Facilitator
<b>Formula Feeding Mothers</b>					
<b>Meaning unit</b>	<b>Condensed meaning unit (Description close to the text)</b>	<b>Condensed meaning unit (Interpretation of the underlying meaning)</b>	<b>Sub-theme (threads of meaning running through condensed text)</b>	<b>Theme</b>	<b>Impact on Breastfeeding</b>
<b>Behavioral Beliefs</b>					
Breastfeeding is best, but baby prefers formula.	Wanted to breastfeed, but felt problems were insurmountable.	It is OK to mix feed or give formula.	Behavioral beliefs are shaped from knowledge obtained and life experiences.	Lack of knowledge of managing common problems leads to formula use.	Barrier
Both breastmilk and formula are the same. Formula is given when there isn't enough breastmilk or baby doesn't like to breastfeed.	Both breastfeeding and formula feeding are important. Formula helps when breastfeeding problems occur.	It is OK to mix-feed.	Behavioral beliefs are shaped from knowledge obtained.	Lack of knowledge of managing common problems leads to formula use.	Barrier
<b>Attitude</b>					
Breastfeeding is the best. When problems arise, need to give formula.	Early problems challenge breastfeeding success.	Without support, breastfeeding failed.	Attitudes of trusted others impact breastfeeding success.	Lack of knowledge in managing common problems leads to formula use.	Barrier
<b>Normative Beliefs</b>					
Breastfeeding is supported by the family.	Families support breastfeeding, but do not know how to manage common problems.	When mothers perceive problems, formula is given.	Normative beliefs are formed when confidence is challenged.	Lack of knowledge about managing common	Barrier

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				problems leads to formula use.	
It is very important to listen to the family, but my baby didn't like breastfeeding.	Families support breastfeeding, but if the baby doesn't like breastfeeding, there is nothing to do except give formula.	When problems occur, formula feeding is acceptable.	When mothers do not know how to manage common problems, decisions are challenged.	Lack of knowledge about managing common problems leads to formula use.	
<b>Subjective Norms</b>					
It is important for the mother to make her own decisions.	Mothers want to make their own decisions.	Mother is becoming more independent of traditional ways.	As mothers adapt to changes in society, the way decisions are made change.	Cultural conflict/ Social change alters traditional decision making.	Barrier
<b>Control Beliefs</b>					
Breastfeeding is easy. There is no cleaning of bottles; no formula to buy. But, with formula, the baby can be left with parents.	There are positives and negatives. Breastfeeding is economical, and easy (no cleaning of bottles). But formula allows independence for the mother.	Advantages and disadvantages to both breastfeeding and formula feeding.	As mothers adapt to cultural/societal change, they lose some control over breastfeeding.	Cultural conflict/ Social change shift away from traditional breastfeeding.	Barrier
Breastfeeding is easy. The family cooks for the mother. But, when mother works, need to give formula.	Family supports the breastfeeding mother by doing extra chores for her. When mother works outside the home, the family gives formula.				
<b>Perceived Behavioral Control</b>					
Thought could breastfeed at first. Wanted to breastfeed so wouldn't have to buy formula. But the nurses said to give formula because there was not enough milk. Breastfeeding is easier, but when there is not enough breastmilk, supplement.	When problems are encountered, breastfeeding is challenged if health care support is lacking.	Problems with breastfeeding make formula more acceptable.	The mother's perception of control is challenged when problems present.	Lack of support from health care staff leads to formula use.	Barrier
The baby started to breastfeed, but the baby had to stay in the hospital after mom was discharged. When tried to breastfeed when visiting baby, the baby didn't want. She told the nurses, but they didn't do anything to help.					
<b>Intention</b>					
Most mothers breastfeed only for 6 months, then use formula with breastmilk for the next 6 months.	Most Chuukese mothers breastfeed for 6 months and then mix feed.	Mix-feeding is acceptable.	Traditional values guide intent.	Cultural conflict/ Social change lead to formula use	Facilitator
Will really try to breastfeed next baby, and will breastfeed as long as the baby wants.	Chuukese mothers want to breastfeed.	Breastfeeding is expected.		Traditional values lead to breastfeeding.	

## **Focus Group Interviews**

### *Demographic Findings from Focus Group Interviews*

The demographic findings from the focus groups are separated into breastfeeding mothers and mothers who gave formula as half or more of their infant feeding. Breastfeeding mothers (n=8) had a mean age of 34 years (range 26-40 years). Six were married, and two lived with their significant other. Most mothers were from Chuuk lagoon islands (Tol, Uman, and Eot). One was from the outer island of Eneop; one from Satawal. Fathers tended to be from outer islands (Eneop, Ettal, and Satawal), while three were from lagoon islands (Uman, Weno, and Tonoas). Mothers had lived on Guam an average of 3.9 years (range 2-5 years). Three mothers had less than high school education, one had completed high school, and four had attended some college. Two fathers had less than high school education, two had completed high school, one had some college, one had an associate degree, and one had a master's degree. Data for one father was not reported. Six mothers received WIC services; two mothers did not. Most mothers (n=5) reported living in apartments; the others (n=3) reported living in single houses. Half of the mothers lived in nuclear households; half lived with extended families (n=4 each). Only one mother indicated she had participated in a breastfeeding support group. Six mothers lived in central Guam (Tamuning, Mangilao, Barrigado, and Maite). Two mothers were from northern Guam (Dededo and Yigo). Two mothers reported annual incomes below \$10,000. Five mothers reported annual incomes of \$10,000-19,000. One mother indicated the income was unknown. All received prenatal care during their most recent pregnancy, with most commencing during the first trimester (n=6). One mother had prenatal care beginning in the second trimester and one mother began prenatal care in the third trimester. Once prenatal care began, mothers reported regular visits. Half of the mothers saw a physician, and half of the mothers saw a nurse

midwife for prenatal care. One mother received prenatal care at a private clinic, and one received prenatal care at Naval Hospital; the other mothers (n=6) all received care through public health. Mothers had delivered from one to five children (average 3.0). Five mothers delivered at Guam Memorial Hospital, two delivered at Sagua Managu (birthing center), and one delivered at Naval Hospital. Five mothers delivered vaginally, and three delivered by cesarean section. All mothers reported exclusive breastfeeding with their most recently born child. Most mothers had exclusively breastfed all of their children. Food supplementation was begun at 6 months of age for all mothers.

The formula feeding mothers (n=10) had a mean age of 30.2 years (range 21-43 years). Seven were married, and three lived with their significant other. Five mothers were from Chuuk lagoon islands (Uman, Udot, and Fefan); four were from the outer islands (Eneop, Ta, and Nema). One mother did not indicate her Chuuk island affiliation. Five fathers were from lagoon islands (Piis Paneil, Uman, and Tol); four were from the outer islands (Eneop, Halls Islands, and Nema). The Chuukese island was not reported for one of the fathers. Mothers had lived on Guam an average of 3.25 years (range 0.5-5 years). Four mothers had less than high school education, two had completed high school, and four had some college education. Five fathers had less than high school education, one had completed high school, three had some college, and one had an associate degree. Seven mothers received WIC services; three mothers did not. About half of the mothers (n=5) reported living in single homes; four reported living in apartments. One mother did not indicate the type of housing. Half of the mothers lived in nuclear households; half lived with extended families. Most did not attend any kind of breastfeeding support group. Five mothers lived in northern Guam (Yigo and Dededo); four were from central Guam (Tamuning, Toto, and Harmon). One mother did not indicate village of

residence. Seven mothers reported income below \$10,000, two mothers reported incomes from \$10,000-19,000, and one reported income \$30,000-39,000. All reported having received prenatal care during their most recent pregnancy, with most commencing during the second trimester; three during the first trimester, six during the second trimester, and one not reported. Once prenatal care began, mothers reported regular visits. Half of the mothers saw a physician, and half of the mothers saw a nurse midwife for prenatal care. All mothers received care through public health. All mothers delivered at Guam Memorial Hospital. Eight mothers delivered vaginally, and two delivered by cesarean section. Mothers had delivered from one to seven children (average 2.7). Most mothers reported mix-feeding with their most recently born child (one mother formula fed only). Most mothers had mix-fed all of their children. Food supplementation was begun at 6 months of age for all mothers. Table 10 summarizes the demographic information for the focus group participants.

Table 10. Demographic Summary for the Focus Group Mothers

<b>Finding</b>	<b>Breastfeeding Mothers</b>	<b>Formula Feeding Mothers</b>
Age (years)	Mean 34 (26-40)	30.2 (21-43)
Marital Status	75% married; 25% living with father of baby	70% married; 30% living with father of baby
Mother's Chuuk Island	75% from lagoon islands; 25% outer islands	50% lagoon islands; 40% outer islands; 10% not reported
Father's Chuuk Island	62.5% outer islands; 27.5% lagoon islands	50% lagoon islands; 40% outer islands; 10% not reported
Length of time on Guam	3.9 years (range 2-5 years)	3.25 years (.5-5 years)
Mothers Education	37.5% less than high school; 12.5% completed HS; 50% some college	40% less than high school; 20% completed HS; 40% some college
Fathers Education	25% less than high school, 25% completed HS; 12.5% some college; 25% college degree	50% less than high school; 10% HS; 30% some college; 10% associate degree
Use WIC Services	75%	70%
Home	62.5% apartment; 27.5% single house	50% single house; 40% apartment; 10% not reported
Household	50% nuclear family; 50% extended family	50% nuclear family; 50% extended family
Breastfeeding Support Group	12.5%	40%
Guam Village	62.5% central Guam; 27.5% northern Guam	50% northern Guam; 40% central Guam; 10% not reported
Annual Incomes	25% < \$10,000; 75% \$10,000-19,999	70% < \$10,000; 20% \$10,000-19,000; 10% \$30,000-39,000
Attended Prenatal Care	100%	100%
Prenatal Care Began	75% first trimester; 25% second/third trimester	30% first trimester; 60% second trimester; 10% not reported
Health Care Provider	50% MD; 50% CNM	50% MD; 50% CNM
Site of Prenatal Clinic	75% PH; 25% private/federal government	100% PH
Site of Delivery	62.5% GMH; 25% birthing center; 12.5% Naval Hospital	100% GMH
Method of Delivery	62.5% vaginally; 27.5% cesarean section	80% vaginally; 20% cesarean section

### ***Interview Findings***

Interview findings from the focus group interviews are provided separately for the breastfeeding mothers and the formula/mix-feeding. Findings are grouped according to the theory of reasoned action, with the most frequent responses listed first in each section.

Facilitators are those aspects that support successful breastfeeding. Several themes emerged as facilitators of breastfeeding. Barriers are those aspects that impede or block breastfeeding

success. Several barriers to breastfeeding were also identified. Discussion of the themes follows. A summary of the findings is provided in Table 11.

### **Breastfeeding mothers**

*Behavioral Beliefs/Attitude.* Behavioral beliefs and attitude focused on three main themes: 1) knowledge acquisition, 2) attitude shaping, and 3) traditional values. Most breastfeeding mothers indicated that they learned much about breastfeeding from persons they trusted. Within the Chuukese culture, person-to-person sharing of information is very important. Mothers received information directly from family and friends. The maternal grandmother was key to teaching new mothers about breastfeeding. While some mothers indicated they received breastfeeding information from health care professionals in verbal and/or written form, most indicated that their maternal grandmother served the role best. Most breastfeeding mothers also indicated that they grew up observing other Chuukese mothers breastfeed their babies, and knowing that breastfeeding was best for their babies.

Positive attitudes about breastfeeding were shaped when mothers acknowledged the benefits to breastfeeding. Mothers were able to iterate many advantages to breastfeeding, especially the health benefits. Mothers also indicated that breastfeeding is traditional in the Chuukese culture, so attitudes were very positive towards breastfeeding.

These themes all represent positive beliefs and attitudes related to breastfeeding. The breastfeeding mothers verbalized no barriers to successful breastfeeding related to behavioral beliefs/attitudes.

*Normative Beliefs/Subjective Norms.* Normative beliefs and subjective norms focused on traditional values as a facilitator. Traditional values shaped the family support. Mothers indicated that breastfeeding is traditional in Chuuk. Families follow tradition. It was very

important for the breastfeeding mothers to meet their family expectations. Maternal grandmother, aunt, and cousins are all important to the mother, but the maternal grandmothers' opinion is most important. The expectation that mothers follow this traditional practice was important to the mothers.

The barrier related to normative beliefs and subjective norms was cultural conflict/social change. Mothers experienced cultural conflict and/or societal change. Most mothers on Guam are required to work to help maintain family finances. With this change from tradition, families adapt by feeding formula to the baby while the mother is at work. In fact, mothers are encouraged to work, and formula is available for the family to feed to the baby.

Another aspect of cultural conflict/social change is found in a change in decision making. Mothers traditionally follow the Chuukese customs. With relocation to Guam, mothers are exposed to other cultural practices, and wish to be independent with regard to decision making. They want to make their own decisions.

***Control Beliefs/Perceived Behavioral Control.*** Control beliefs and perceived behavioral control as facilitators resulted in the following themes: 1) family support, 2) traditional values, and 3) confidence. Family support was very important to the breastfeeding mother's feeling of being in control. Family members provided a social network to support breastfeeding, and encouraged mother in her breastfeeding efforts. With this, mothers gained confidence that they would be successful with breastfeeding. Family and friends helped with various household chores and cooked nutritious food for the mother, so mothers could focus on gaining success with breastfeeding. In fact, the mother is not allowed to do these household activities so that she will heal and be able to care for herself and her baby. In Chuukese, this is called "Saan".

Traditional values fostered control in the mothers. Breastfeeding also allowed mothers to have control over the convenience and economics of infant care. With breastfeeding, there were no formula or bottles to purchase, leaving more money available for other family needs. Breastfeeding was also convenient, with no need to prepare formula and clean bottles.

Mothers also felt confidence with breastfeeding. Several mothers indicated that breastfeeding was easy, but they also knew if they had problems, they could turn to family first, with health care professionals as a back-up, to aid with resolution of problems.

Barriers included: 1) cultural conflict/social change, and 2) lack of commitment. Cultural conflict/social change was a theme related to control. Mothers indicated that breastfeeding in public was common in Chuuk. However, on Guam, they felt it is unacceptable to breastfeed in public in Guam.

Mothers were committed to breastfeeding. One mother indicated that breastfeeding can be difficult sometimes. She felt restrictions in that she needed to stay with her baby during the day, or take the baby with her. She also was the only one who could feed the baby at night. Despite these concerns, she continued to breastfeed.

***Intention.*** The prominent theme related to intention was meeting traditional values and beliefs. Many breastfeeding mothers indicated that traditionally, Chuukese mothers breastfeed for 2 years or more. Their intent was to follow those norms. Other mothers indicated shorter duration of breastfeeding, but exclusive breastfeeding for at least six months was important to the mothers. Work, pregnancy, and other life events seemed to shorten the length of breastfeeding, but mothers remained committed to breastfeeding as long as possible. Several mothers indicated they wished to breastfeed for as long as their baby wanted to. No barriers to breastfeeding were voiced by mothers related to intent.

### **Formula/Mix-Feeding Mothers**

*Behavioral Beliefs/Attitude.* Unfortunately, in this category, no facilitators of breastfeeding were identified by the formula/mix-feeding mothers. Several barriers to successful breastfeeding were identified as related to behavioral beliefs and attitudes. These include: 1) mixed messages, 2) lack of knowledge about managing common problems, and 3) lack of support from family or health care staff.

Many formula-feeding mothers had the belief that breastmilk and formula are equally good. One mother indicated that no one had talked to her about infant feeding during her pregnancy. They viewed formula as an appropriate alternative to breastmilk when there were problems related to perceived low milk supply or difficulty with latch, representing lack of knowledge in managing common problems.

When these problems presented, if support from health care or family was lacking, they resorted to formula or mix-feeding. One mother reported that she had problems with latch-on. Although the nurses told her to keep breastfeeding, no one helped her with the latch. The WIC staff did home visits, but finally gave her a breast pump after several weeks. This help came too late, and she expressed distress at failed breastfeeding. Formula feeding mothers also reported lack of family support when the maternal grandmother was not present, either due to geographic isolation or death.

Mixed messages that were received resulted in a barrier to breastfeeding. Mixed messages confused mothers' beliefs. Formula feeding mothers also indicated mixed messages received from family. Although they believe that breastfeeding is best, the family also supports formula feeding as an acceptable alternative.

*Normative Beliefs/Subjective Norms.* Normative beliefs and subjective norms focused on knowledge acquisition as the facilitator. When the WIC staff told one mix-feeding mother that she should stop giving formula to prevent obesity in her baby, she limited the amount of formula she gave to her baby.

Barriers related to normative beliefs and subjective norms included: 1) cultural conflict/social change, and 2) lack of knowledge about managing common problems. Mothers experienced cultural conflict and/or societal change. Most mothers on Guam are required to work to help maintain family finances. With this change from tradition, families adapt by feeding formula to the baby while the mother is at work. In fact, mothers are encouraged to work, and formula is available for the family to feed to the baby.

Another aspect of cultural conflict/social change is found in a change in decision making. Mothers traditionally follow the Chuukese customs. With relocation to Guam, mothers are exposed to other cultural practices, and wish to be independent with regard to decision making. They want to make their own decisions.

One last aspect of cultural conflict/social change is found in regard to migration. Mothers who had moved to Guam, reshaped their values to adjust into the new social environment. Mothers wanted to fit in. When the mothers believed that formula feeding is “Americanized” or “Guamanian,” they formula fed.

A recurring theme that was elicited was that mothers did not perceive that they produce enough milk for the baby, so mix-feeding was necessary. Mothers were not well informed about management of common breastfeeding problems.

***Control Beliefs/Perceived Behavioral Control.*** No facilitators were identified related to control or perceived control. There were many barriers to achieving control. These included: 1) lack of support from family, health care, and community, and 2) cultural conflict/social change.

Lack of support was by far the most frequently voiced concern that hampered mother's feeling of control. Lack of support from health care was the most frequently cited problem. Numerous examples were given citing lack of support from health care workers. One mother stated that hospital and public practices do not support breastfeeding. Hospital practices that posed barriers to breastfeeding included limited breastfeeding immediately after delivery, limited access to babies for several hours post-delivery, formula feeding during this separation, and providing formula to breastfeeding mothers. Mothers reported difficulty with getting the baby to latch on. Nurses provided formula to those mothers instead of assisting mothers with latch. Mothers perceived lack of milk supply. Nurses gave formula to feed the baby.

Several mothers reported that nurses provided formula to them even when they wanted to breastfeed exclusively, and even when no problems were occurring. As explained by the mothers, in the Chuukese culture, it is rude to not accept a gift when it is offered, so the mothers mix-fed their babies. There was also confusion among the mothers, as many thought that the gift of formula meant that mix-feeding was best for the baby. Many mothers also reported that when their babies had to remain in the nursery, even if for a short period of time, the nurses gave formula. Subsequently the babies did not want to breastfeed.

One mother had to leave her baby in the nursery when she was discharged. The baby had been breastfeeding successfully prior to the mother's discharge. Once the mother left, the nurses gave formula. When the mother tried to breastfeed when she visited the nursery, the baby would not. The mother told the nurses, but they did nothing to help her. She lost control.

Other problems cited by mothers were separation from their babies after cesarean sections, pain and bleeding from nipples, perceived lack of milk supply, difficulty with the latch, and so on. Mothers reported that their babies were given formula during these times, and then would not breastfeed.

Lack of support from family or health care was also cited. Mothers felt fatigue when getting up to feed the baby at night. When the mother did not feel support from the family to ensure adequate rest, she felt a loss of control. Mothers also voiced concerns that breastfeeding was challenging. Though problems existed, many mothers did not ask for help or know how to receive help. When mothers did not feel control over the resolution of problems, they turned to formula or mix-feeding.

Mothers also reported problems related to lack of support from the community. Several mothers went back to work or school following the birth of the baby. When they encountered lack of a safe place to pump or breastfeed their baby at the work/school site, they chose alternative methods of feeding.

Cultural conflict/social change was another theme related to control. One mother indicated that the younger generation struggles with tradition as they are exposed to new ways. As she tries to fit into the new culture/society, she feels conflict and loss of control. Another aspect of conflict deals with the social change resulting from working. As families need the additional income from the mother, they support formula feeding the baby so mother can work. Although the many advantages to breastfeeding were well known to the mothers, with formula feeding, the baby can be left with the parents or other family members while mother is away. Some mothers felt conflict with control in making the decisions regarding infant feeding.

***Intention.*** The prominent facilitator related to intention was meeting traditional values and beliefs. Many formula/mix-feeding mothers indicated their intent to continue formula/mix-feeding for one year or more. Other mothers indicated shorter duration of breastfeeding, but exclusive breastfeeding for at least six months was important to the mothers.

The barrier to intention was cultural conflict/social change. Mothers who are conflicted by changing culture and social practices intend to breastfeed for shorter periods of time. Most Chuukese mothers planned to mix-feed for at least six months, and then formula feed.

Those mothers following tradition, planned to mix-feed for one to three years. The mothers reiterated that Chuukese culture expects mothers to breastfeed.

Table 11 Summary of Key Informant and Focus Group Interviews for Chuukese Mothers (Breastfeeding and Formula/Mix-Feeding)

<b>Breastfeeding Mothers</b>					
<b>Meaning unit</b>	<b>Condensed meaning unit (Description close to the text)</b>	<b>Condensed meaning unit (Interpretation of the underlying meaning)</b>	<b>Sub-theme (threads of meaning running through condensed text)</b>	<b>Theme</b>	<b>Impact on Breastfeeding</b>
<b>Behavioral Beliefs</b>					
Breastfeeding is best. Knowledge is gained from each other by word of mouth, from doctors, nurses, and family.	Talking is the best way to relay information. Reading is not convenient. Doctors and nurses are educated; parents are experienced; friends are easy to talk to.	Person to person sharing of knowledge is important.	Behavioral beliefs are shaped from contact with a trusted person.	Knowledge acquisition from a trusted person leads to breastfeeding success.	Facilitator
Breastfeeding is better because it comes from us. Mothers breastfeed on my island. I knew I should breastfeed from when I was a little girl. I saw others breastfeeding.	Life experiences allow mothers to grow up knowing that breastfeeding is best.	Personal exposure to breastfeeding is important.	Behavioral beliefs are shaped from exposure to life experiences.	Knowledge acquisition through life experiences supports successful breastfeeding.	
Breastfeeding is best. Written materials from the clinic are also important.	Written information allows mothers time to process information at home.	Written materials are helpful to some mothers	Behavioral beliefs are also shaped from written information.	Knowledge acquisition from trusted sources leads to breastfeeding success..	
<b>Attitude</b>					
Breastfeeding is easier. There are no bottles to wash. It's easy to get sick from bottles. Babies hardly get sick if they are breastfed. Breastfeeding is cheaper. Baby has better connection between mom and baby. They are healthy. Both are important, but breastfeeding saves money.	There are many advantages to breastfeeding.	Convenience, economic benefit, bonding/attachment, and health are important reasons to breastfeed.	Positive attitudes are formed when advantages to breastfeeding are noted.	Attitude shaping – advantages to breastfeeding leads to successful breastfeeding.	Facilitator
Breastfeeding is so important that breastfeeding in public is acceptable. Mothers who have had several children are comfortable with that. New mothers are shy.	Breastfeeding is so important, many mothers will breastfeed in public on Guam	Breastfeeding is very important.	Positive attitudes are formed when traditional values are in place.	Traditional values shape attitudes and lead to successful breastfeeding.	
Breastfeeding is better. Formula fed babies get fat.	There are disadvantages to formula feeding.	Health benefits make breastfeeding important.	Positive attitudes are formed when advantages and disadvantages are considered.	Attitude shaping – disadvantages to formula feeding leads to successful breastfeeding.	
<b>Normative Beliefs</b>					
Families expect mothers to breastfeed their babies.	Families advocate breastfeeding.	Families want their babies to be breastfed.	When the mother believes her family supports breastfeeding, successful breastfeeding is achieved.	Traditional values lead to successful breastfeeding	Facilitator
Families expect breastfeeding, but will give formula if mom is working.	Families advocate for breastfeeding, but support formula supplementation if mom is	Mix feeding is acceptable for working moms.	Normative beliefs are challenged when exposed to differing needs	Cultural conflict/ Social change challenge beliefs and	Barrier

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	working.		between family and the new culture/society.	lead to formula use.	
<b>Subjective Norms</b>					
Mothers consider what family and friends think, but in the end, they make their own decisions.	It is a traditional expectation that mother's breastfeed their babies. Mothers are beginning to be independent of family values.	Mothers are making their own decisions.	As mothers adapt to changes in society, the way decisions are made change.	Cultural conflict/ Social change alters traditional decision making.	Barrier
Families expect mothers to breastfeed. Family opinion (maternal grandmother, auntie, cousins) is very important. It is very important that family expectations are met. The maternal mother's opinion is most important.	Family is important. The maternal mother's opinion is most important.	The family, and especially the maternal mother, is important to the mom's decision. Breastfeeding is expected.	When mothers follow tradition, they breastfeed.	Traditional values and beliefs foster breastfeeding.	Facilitator
<b>Control Beliefs</b>					
Breastfeeding is easy. Friends and family help to cook and do household chores. That helps with breastfeeding.	Family and friends help with other chores to allow time for breastfeeding.	Family and friends support breastfeeding.	Control in breastfeeding is facilitated when family and friends assist with household chores.	Family support empowers control in the mother's ability to breastfeed.	Facilitator
Maternal and paternal grandmothers spent time helping mother to breastfeed.	Grandmothers are important to initiation of breastfeeding.	Grandmothers support breastfeeding.	When mothers have help with initiation of breastfeeding, they feel more control.	Family support from grandmothers aid in initiation of breastfeeding.	
Breastfeeding is easy. Don't have to pay for milk. Don't have to clean bottles or prepare formula.	Breastfeeding is easy, and there are many advantages to breastfeeding.	Breastfeeding ease, economics, and convenience make mothers feel control.	When mothers weigh the advantages to breastfeeding, they feel control.	Traditional values and beliefs foster breastfeeding	
Sometimes breastfeeding is hard because showing breast in public to breastfeeding is hard.	Breastfeeding in public is acceptable in Chuuk. Mothers do not believe it is acceptable in Guam.	Mothers who would breastfeed in public in Chuuk feel uncomfortable breastfeeding in public on Guam.	Mothers want to fit in to the new society, and feel lack of control.	Cultural conflict/social change hinder successful breastfeeding.	Barrier
Breastfeeding is hard sometimes. The mom needs to stay home more, or take the baby with her. Have to get up at night to feed the baby. Can't sleep. Breastfeeding is best, so still breastfeeds.	Breastfeeding requires commitment. Mom must be available for infant feeding.	Breastfeeding is important, so accepts the need for commitment.	If the mother cannot commit to the time responsibility that is necessary for breastfeeding success, breastfeeding is challenged.	Lack of commitment challenges feelings of control and leads to formula use.	
<b>Perceived Behavioral Control</b>					
Breastfeeding is easy. If there were problems, talk to family first; then doctor. Family (maternal grandmother and father of the baby) encouraging.	Breastfeeding is easy. Families can give advice if there is a problem. Doctors can too.	Family support helps through challenges with breastfeeding.	When mothers feel support from family, they feel control over breastfeeding.	Family support allows mothers to feel in control to breastfeed.	Facilitator
Was very confident could breastfeed. When there were any problems, the birthing center staff helped.	Health care staff members can help facilitate confidence in breastfeeding mothers.	Support from health care staff helps mothers feel they are in control.	Perceived control aids in breastfeeding success.	Confidence in breastfeeding results from perceived behavioral control .	
<b>Intention</b>					
Learned and heard that 2 years is best. Originally thought I'd breastfeed for 2	Mothers achieve long-term breastfeeding success.	Mom and baby control the length of breastfeeding.	Intent to achieve long-term breastfeeding is	Traditional values support extended	Facilitator

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years, but went past that.			facilitated by traditional values and beliefs.	breastfeeding intent.	
Babies are breastfed until they start to eat, then combine food with breastmilk.	Mothers plan to breastfeed exclusively until baby is 6 months old.				
Babies are breastfed until 8 months to 1 year old, or mother looks for a job.	Mothers plan to exclusively breastfeed until food is added to the diet and then for at least one year, or until mother goes to work. Pregnancy may alter length of breastfeeding.				
I stopped at one year because I was pregnant.					
I plan to breastfeed as long as my baby wants to.					
Formula/Mix-Feeding Mothers					
Meaning unit	Condensed meaning unit (Description close to the text)	Condensed meaning unit (Interpretation of the underlying meaning)	Sub-theme (threads of meaning running through condensed text)	Theme	Impact on Breastfeeding
Behavioral Beliefs					
Both breastmilk and formula are the same. Formula is given when there isn't enough breastmilk or baby doesn't like to breastfeed.	Both breastfeeding and formula feeding are important. Formula helps when breastfeeding problems occur.	It is OK to mix-feed.	Behavioral beliefs are shaped from knowledge obtained and life experiences.	Lack of knowledge in managing common problems leads to formula use.	Barrier
Breastfeeding is best, but I also give some formula. Nobody talked to me about breastfeeding when I was pregnant.					
Breastfeeding is best. Mix feeding is OK with family.	Family teaches about breastfeeding, but they are OK with mix feeding.	Family supports both breastfeeding and formula feeding.	Behavioral beliefs are formed when mixed messages are received.	Mixed messages conflict mother's beliefs and lead to formula use.	
Always thought would breastfeed. Then baby couldn't latch on, and no one could help. The nurses said to breastfeed, but didn't help. WIC staff even came to house, but no one could help.	Really wanted to breastfeed, but felt problems were insurmountable. No one helped.	Staff encourage breastfeeding, but did not help mother.	Behavioral beliefs are formed when mothers do not feel supported.	Lack of support from trusted health care staff leads to formula use.	
Attitude					
Breastfeeding is best, but when there is not enough or no milk, must mix-feed or give formula. Maternal grandmother said to give formula because there was no breastmilk.	Breastfeeding is better for the baby. Early problems challenge breastfeeding success.	Breastfeeding is best. Without the presence of the maternal grandmother, mothers don't have support for breastfeed.	Attitudes form from life experiences.	Lack of family support challenges breastfeeding success, resulting in formula use.	Barrier
Breastfeeding is best. When maternal grandmother died, there was no support.	Breastfeeding is best, but without the support from the maternal grandmother, it is difficult to breastfeed.				
Breastfeeding is the best. When problems arise, need to give formula.	Early problems challenge breastfeeding success.	Without support, breastfeeding failed.	Attitudes of trusted others impact breastfeeding success.	Lack of knowledge in managing common problems leads to formula use.	

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How a baby is fed is important. Tries not to think about this, though, because couldn't get baby to breastfeed. No one helped.	Wanted to breastfeed, but early problems challenged breastfeeding success.	Without health care staff support, breastfeeding failed.	Attitudes of staff impact breastfeeding success.	Lack of health care support led to breastfeeding failure.	
<b>Normative Beliefs</b>					
Breastfeeding is best, but if working or not at home, family gives formula.	Families support breastfeeding, but also support mix feeding if mother is outside the home.	Mothers need to be able to leave the home sometimes, so mix feeding is acceptable.	Normative beliefs are challenged when differing life experiences encountered on Guam.	Cultural conflict/ Social change challenge beliefs and result in formula use.	Barrier
Breastfeeding is supported by the family. When there isn't enough milk, formula is also given.	Families support breastfeeding, but do not know how to manage common problems.	When mothers perceive limited milk supply, formula is given.	Normative beliefs are formed when confidence is challenged.	Lack of knowledge about managing common problems leads to formula use.	
<b>Subjective Norms</b>					
It is important for the mother to make her own decisions.	Mothers want to make their own decisions.	Mother is becoming more independent of traditional ways.	As mothers adapt to changes in society, the way decisions are made change.	Cultural conflict/ Social change alters traditional decision making and leads to formula use.	Barrier
It is very important to listen to the family, but my baby didn't like it.	Families support breastfeeding, but if the baby doesn't like breastfeeding, there is nothing to do except give formula.	When problems occur, formula feeding is acceptable.	When mothers do not know how to manage common problems, decisions are challenged.	Lack of knowledge about managing common problems leads to formula use.	
Family influence is important. But if you work, the family can give formula for you.	Families support breastfeeding, but will also support mix feeding so that they can take care of the baby while mom works.	Moms need to work, so mix feeding is acceptable.	As mothers and families adapt to changes in society, the way decisions are made change.	Cultural conflict/ Social change alter traditional decision making, resulting in formula use.	
The WIC staff told me to stop giving formula because my baby was getting fat. They said to just breastfeed.	WIC staff provided breastfeeding education.	WIC staff encourage breastfeeding.	As mothers gain knowledge about breastfeeding, less formula is given.	Knowledge acquisition from trusted other results in breastfeeding.	Facilitator
<b>Control Beliefs</b>					
Couldn't get baby to latch on. Nurses gave formula. Finally the staff from WIC gave a pump at 2 ½ months, but it was too late.	Health care staff provide limited support to mothers	Health care staff provided formula when breastfeeding problems arose.	When mothers do not feel support from the staff, they lack control over common problems.	Lack of support from health care staff challenge mothers feeling of control, resulting in formula use.	Barrier
When there is not enough milk, formula has to be given.					
When started working or went back to school, there was no place to breastfeed or pump milk, so gave formula.	Need a safe place to breastfeed in public.	If there is no place to feel safe to breastfeed in public, formula is given.	When community support for breastfeeding is missing, mothers choose alternative feeding methods.	Lack of community support blocks breastfeeding success.	
Breastfeeding is easy. There is no cleaning of bottles; no formula to buy. But, with formula, the baby can be left with parents.	There are positives and negatives. Breastfeeding is economical, and easy (no cleaning of bottles). But formula allows independence for the mother.	Advantages and disadvantages to both breastfeeding and formula feeding.	As mothers adapt to cultural/societal change, they lose some control over breastfeeding.	Cultural conflict/ Social change shift away from traditional breastfeeding.	

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Breastfeeding is easy. The family cooks for the mother. But, when mother works, need to give formula.	Family supports the breastfeeding mother by doing extra chores for her. When mom works outside the home, the family gives formula.				
Breastfeeding is easier than formula feeding, especially if the family doesn't expect the mother to work.	Breastfeeding is easy if the mother doesn't have to work.	Work makes breastfeeding more difficult.			
Breastfeeding makes a mother tired. She has to get up to feed the baby. Formula has to be purchased, and the baby can get sick from dirty bottles.	Breastfeeding is tiring, especially at night. Preparing formula is expensive and labor intensive.	Advantages and disadvantages to both breastfeeding and formula feeding.	Weighing advantages and disadvantages challenge control.	Cultural conflict/ Social change challenge mothers control, resulting in formula use.	
<b>Perceived Behavioral Control</b>					
The nurses gave formula. In Chuukese culture, it is rude to not accept a gift when it is given, so baby was mix fed. The baby stayed in the nursery the first night, so was used to formula by the time he/she came to me.	When problems are encountered, breastfeeding is challenged if health care support is lacking.	Problems with breastfeeding make formula more acceptable.	The mother's perception of control is challenged when problems present.	Lack of support from health care staff makes formula-feeding easier.	Barrier
The baby started to breastfeed, but had to stay at the hospital after mother's discharge. When mother visited the baby in the nursery, the nurses had given formula, and didn't want mother's breast. Mother told the nurses, but they didn't do anything to help.					
The nurses gave formula. Since the nurses gave formula in the nursery, thought was supposed to continue formula at home, so mix fed.					
The baby stayed in the nursery, and only came to mother for feedings, so was used to formula.					
Thought could breastfeed at first. Wanted to breastfeed so wouldn't have to buy formula. But the nurses said to give formula because there was not enough milk. Breastfeeding is easier, but when there is not enough breastmilk, supplement.					
Was confident that would be able to breastfeed, but then baby had to stay in the nursery, and didn't like her breasts anymore.					
The baby started to breastfeed, but the baby had to stay in the hospital after mom was discharged. When tried to breastfeed when visiting baby, the baby didn't want. She told the nurses, but they didn't do anything to help.					
Wanted to breastfeed. Had a cesarean section, and the baby stayed in the nursery.					

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The nurses came with formula, and said to give formula.					
It's easy to breastfeed during the day; at night it's hard to get up.					
When tried to breastfeed, had pain and blood from her breast. She gave formula then.					
<b>Intention</b>					
One year.	Most Chuukese mothers breastfeed.	Breastfeeding is expected.	Traditional values guide intent.	Traditional values and beliefs support prolonged breastfeeding	Facilitator
Most mothers breastfeed for 2-3 years.					
Most mothers breastfeed only for 6 months, then use formula with breastmilk for the next 6 months.	Most Chuukese mothers breastfeed for 6 months and then mix feed.	Mix- feeding is acceptable.	Cultural conflict/Social change affects intent to breastfeed.	Cultural conflict/ Social change lead to formula use.	Barrier
Will really try to breastfeed next baby, and will breastfeed as long as the baby wants.	Chuukese mothers want to breastfeed.	Breastfeeding is expected.	Traditional values guide intent.	Traditional values lead to breastfeeding.	Facilitator

## Summary

This study focused on identifying facilitators and barriers to successful breastfeeding among migrant Chuukese mothers living on Guam, using the theory of reasoned action. Key informant and focus group interviews were conducted. Table 12 displays the facilitators and barriers identified by the migrant Chuukese mothers.

Table 12: Facilitators and Barriers Identified by the Chuukese Migrant Mothers

Theme	Breastfeeding Mothers		Formula/Mix-Feeding Mothers	
	Facilitators	Barriers	Facilitators	Barriers
Attitude shaping	X			
Confidence	X			
Family support	X			
Knowledge acquisition	X		X	
Traditional values	X		X	
Cultural conflict/ Social change		X		X
Lack of commitment		X		
Lack of community support				X
Lack of family support				X
Lack of health care staff support				X
Lack of knowledge about managing common problems				X
Mixed messages				X

## **CHAPTER 5: DISCUSSION AND CONCLUSION**

This study focused on breastfeeding among Chuukese migrant mothers living on Guam. The theory of reasoned action was used as the guiding theory. A comprehensive literature review was also completed. Discussion will focus on relating the findings to the literature and the theory of reasoned action.

### **Discussion**

#### **External Variables.**

Demographic characteristics serve as antecedents to breastfeeding success. Within the theory of reasoned action, however, demographics are considered external variables that are related to behavior only if they are related to one or more variables in the theory. Breastfeeding key informants had a mean age of 28 years; the breastfeeding focus group participants had a mean age of 34 years. Formula/mix-feeding mothers were slightly younger; the key informants had a mean age of 23 years; the formula feeding focus group participants had a mean age of 30 years. While Dulon, Kersting, and Bender (2003) found younger mothers more likely to breastfeed, the findings of Jackson, Wilkin, and Auerbach (1956) and Winicoff, Laukaran, Myers, and Stone (1986) support the idea that older mothers were more likely to breastfeed. The literature is divided in terms of age. The migrant population in this study had similar ages whether breastfeeding or not. The findings for age cannot be directly linked to breastfeeding behavior.

Education is another external variable studied. Approximately half of the mothers from this study, whether breastfeeding or formula/mix-feeding, had less than or high school level education. The other half had some college. Research from Birenbaum, Fuchs, and Reichman (1989) found those mother with less education to breastfeed with higher frequency, while

Jackson, Wilkin, and Auerbach (1956), Kemberling (1979), Kuan, et al (1999), Kruse, et al (2006), Thulier and Mercer (2009), and Whalen and Cramton (2010) found mothers with higher education more likely to breastfeed. The breastfeeding and formula/mix-feeding mothers were similar in relation to education, and in fact, the mothers with "higher education" had only had some college. Therefore, the entire population would be considered lacking "higher education". There was not enough difference in the education level of the population to draw conclusions.

Culture was another variable considered. All of the mothers were from Chuuk State, FSM. While many authors found Caucasians to be more likely to breastfeed, Kemberling (1979), Whalen and Cramton (2010), and Winicoff, Laukaran, Myers, and Stone (1986) found non-white mothers more likely to breastfeed. In this study, breastfeeding and formula/mix-feeding mothers were culturally similar in some ways. The lagoon islands tend to have higher population density and are somewhat urbanized, while the outer islands are more rural. More breastfeeding mothers were from lagoon islands (75%) than outer islands (25%). This was also found with formula/mix-feeding mothers, but a higher percentage of the mothers were from outer islands (50% lagoon, 40% outer islands, 10% not reported). Fathers were very similar to mothers in both the breastfeeding mothers and the formula/mix-feeding mothers. In the originating culture breastfeeding is highly traditional and therefore the norm. In the migrant culture an imposed separation from the originating culture has been created by the reduced levels of breastfeeding in the local culture and bars to breastfeeding imposed by the health care community and the local Guam norms. There is a desire to fit into the local culture. This will be discussed further in the focus group findings.

Family income was also considered. All mothers reported incomes that are considered low by U.S. and even Guam standards. However, the formula feeding mothers had lower

incomes overall. While most authors found higher socioeconomic status to correlate with breastfeeding, Dulon, Kersting, and Bender (2003), and Thulier and Mercer (2009) found breastfeeding in mothers from low socioeconomic status. The literature is divided in terms of socioeconomic status. Socioeconomic status is not directly related to breastfeeding behavior in this population. The lowest incomes were found in the formula/mix-feeding mothers. This is difficult to explain. One might expect lower income households to avoid the increased cost of formula feeding. Alternatively, one might expect that higher household incomes might imply increased maternal input of funds, and therefore more imposed separation from the baby with subsequent formula feeding. However, if increased income is from the father's income, then the mother might have more time and resources to breastfeed. That would explain increased breastfeeding in higher income households. No conclusions can be drawn with the current information.

Marital status was another external variable considered. All mothers, both breastfeeding and formula/mix-feeding, reported being married or living with the father of the baby. Birenbaum, Fuchs, and Reichman (1989), Kuan, et al (1999), Thulier and Mercer (2009), and Winicoff, Laukaran, Myers, and Stone (1986) found breastfeeding in mothers who were married or lived with their partner. The results from this study do support the findings of these authors, but do not explain similarities found with both the breastfeeding and formula/mix-feeding mothers.

Parity is another variable considered. Breastfeeding mothers had delivered from one to five children (average 3.0); formula/mix-feeding mothers had delivered one to seven children (average 2.7). Flood and Dodgson (2010) found primiparas more likely to breastfeed; Whalen and Cramton (2010), and Winicoff, Laukaran, Myers, and Stone (1986) found multiparas more

likely to breastfeed. One would expect that multiparas who previously breastfed would breastfeed the current baby.

Birenbaum, Fuchs, and Reichman (1989), Dulon, Kersting, and Bender (2003), and Whalen and Cramton (2010) found previous breastfeeding experience to support breastfeeding in subsequent children. In this study, most multipara mothers, whether breastfeeding or formula/mix-feeding had prior experience with breastfeeding. Even if mothers had breastfed before, they may not breastfeed now based on other external variables such as new culture on Guam, work responsibilities and so on.

The length of time on Guam was studied. Sussner, Lindsay, and Peterson (2008), and Celi, et.al (2005) found mothers tended to breastfeed soon after migration, but as residence increased and English language was adopted, breastfeeding rates declined. Breastfeeding mothers had lived on Guam an average of 3.9 years; formula/mix-feeding mothers had a mean of 3.25 years on Guam. The findings are similar. Other findings that were similar across the groups included use of WIC services, household (nuclear vs extended), health care provider (MD vs CNM), site of prenatal care, and method of delivery.

One interesting finding was that while only 12.5% of breastfeeding mothers reported use of a breastfeeding support group; 40% of formula/mix-feeding mothers reported the use of a breastfeeding support group. Perhaps the formula/mix-feeding mothers sought help to try to successfully breastfeed.

All mothers reported attending prenatal care. Breastfeeding mothers tended to seek prenatal care during the first trimester (75%), while only 30% of formula/mix-feeding mothers sought prenatal care during the first trimester. Perhaps breastfeeding promotion occurs more commonly in the first trimester, so formula/mix-feeding mothers missed this discussion with

their providers. Most of breastfeeding mothers (75%) received prenatal care at public health; the remainder received prenatal care from private providers or through the federal government health care system. All formula/mix-feeding mothers received prenatal care at public health. These findings are similar between groups.

Most mothers delivered at Guam Memorial Hospital. Breastfeeding mothers delivered at Guam Memorial Hospital (62.5%); at the birthing center (25%); and at Naval Hospital (12.5%). All formula/mix feeding mothers delivered at Guam Memorial Hospital. Breastfeeding mothers delivered vaginally or by cesarean section (62.5% and 27.5% respectively). Formula/mix feeding mothers delivered vaginally (80%) or by cesarean section (20%).

There were very limited demographic differences between the breastfeeding mothers and the formula/mix-feeding mothers. The theory of reasoned action only considers external variables as they relate to one or more variables in the theory. These findings from the demographic data support the theory of reasoned action. This study did not compare breastfeeding and formula/mix-feeding with the originating culture. In this study, external variables did not directly influence breastfeeding behavior.

### **Breastfeeding and Formula/Mix-feeding Mother Interviews.**

Findings from the mother interviews (6 key informant mothers; 18 focus group mothers; n=24) centered on the following themes: 1) knowledge acquisition/lack of knowledge, 2) attitude shaping, 3) family support/lack of support from family, health care staff and/or community, 4) traditional values, 5) confidence, 6) mixed messages, 7) cultural conflict/social change, and 8) lack of knowledge about managing common problems.

**Facilitators.** Breastfeeding mothers reported a higher number of what would be considered facilitators for breastfeeding compared to formula/mix feeding mothers. Five

facilitator themes were identified: 1) attitude shaping, 2) confidence, 3) family support, 4) knowledge acquisition, and 5) traditional values.

***Attitude shaping.*** Attitude shaping is a function of attitude within the theory of reasoned action. Jelliffe (1955, 1956, 1967, 1976) did extensive research over several decades, and concluded that attitude plays a key role in breastfeeding success. Breastfeeding mothers identified many advantages to breastfeeding, adopting a positive attitude towards breastfeeding. Likewise, when they weighed the advantages and disadvantages to breastfeeding, positive attitudes toward breastfeeding were shaped. These findings suggest that when attitudes are positive and other social circumstances are positive breastfeeding follows.

***Confidence.*** Confidence was important to the breastfeeding mothers' sense of control within the theory of reasoned action. It was also supported in the literature. Avery, Zimmerman, Underwood, and Magnus (2009), Bonuck, Freeman, and Trombley (2005), Brand, Kothari, and Stark (2011), Cramton, Zain-Ul-Abideen, and Whalen (2009), Driscoll (1992), Entwistle, Kendall, and Mead (2009), Hoddinott and Pill (2000), Kemberling (1979), Kools, et al. (2006), Moore and Coty (2006), and Sutherland, et al. (2011) all found that mothers who had confidence in their ability to breastfeed were successful. The breastfeeding mothers indicated that they were very confident in their belief that they would be able to successfully breastfeed. This confidence was not found in the formula/mix-feeding mothers.

***Support from family and health care staff.*** This theme was linked to control. Control beliefs and perceived behavioral control are components of the theory of reasoned action. Breastfeeding mothers indicated that they felt control over breastfeeding when there was support from family or health care staff. They related very few problems, but felt that if

problems did occur they would receive support from family and health care staff, specifically from Sagua Managu, the birthing center on Guam.

***Knowledge Acquisition.*** Knowledge acquisition from trusted persons and life experiences were the recurring themes identified that impacted behavioral beliefs of both breastfeeding and formula/mix-feeding mothers. Knowledge acquisition is also noted in the literature. Babington and Patel (2008), and Flood, Dodgson (2010) found mothers sought their own information related to breastfeeding. Babington and Patel (2008), Elliot and Gunaratnam (2009), and Morrison, et.al.(2008) identified knowledge acquisition from family. Babington and Patel (2008) found WIC programs to be important in providing breastfeeding information to mothers. Babington and Patel (2008), Baker, Sanei, and Franklin (2006), Barona-Vilar, Escriba-Aguir, and Ferrero-Gandia (2009), Bhutta and Labbok (2011), Cramton, Zain-Ul-Abideen, and Whalen (2009), Elliott and Gunaratnam (2009), Flood and Dodgson (2010), Henderson and Redshaw (2010), Kemberling 1979), Kuan, et al (1999), Morrison, et al (2008), Sarasua, Clausen, and Frunchak (2009), and Winicoff, et al (1986) all found health care professionals as key to imparting knowledge to mothers. While mothers acquired knowledge from varied sources, the Chuukese mothers primarily acquired information from trusted individuals close to them and from life experiences related to breastfeeding. The maternal grandmother was a particularly important family member to encourage and support breastfeeding in mothers.

***Traditional values.*** Traditional values was a theme that was found within several aspects of the theory of reasoned action. Breastfeeding mothers identified tradition as a key component of their attitude related to breastfeeding.

Family was a very important concept involving tradition. Breastfeeding mothers believed that their families wanted them to breastfeed. This functioned as part of mothers' normative

beliefs and subjective norms. They wanted to follow what they believed to be their family's wishes related to breastfeeding. Formula/mix-feeding mothers also related some traditional values in their intent to breastfeed subsequent babies.

Breastfeeding mothers also considered traditional values within their control beliefs. When mothers weighed the advantages of breastfeeding, they felt they had control over their decision-making and their success with breastfeeding.

Breastfeeding mothers followed tradition in determining the duration of the breastfeeding experience. Most indicated an intent to breastfeed for at least one to two years, with the mother and baby controlling the length of the breastfeeding experience. Only the introduction of solid food, work, or additional pregnancies changed their intent.

**Barriers.** More barriers than facilitators were identified for formula/mix feeding mothers. The key barrier themes identified include: 1) cultural conflict/social change, 2) lack of commitment, 3) lack of community support, 4) lack of family support, 5) lack of health care support, 6) lack of knowledge in managing common problems, and 7) mixed messages.

*Cultural conflict/social change.* Cultural conflict/social change was a recurring theme that was identified for breastfeeding and formula/mix-feeding mothers alike.

Breastfeeding mothers indicated their belief that their families expected them to breastfeed. This is tradition within the Chuukese culture. However, economic constraints make work also important. When the mother worked, they believed that their family supported mix-feeding their babies. Formula/mix-feeding mothers also felt cultural conflict/social change. Like the breastfeeding mothers, the formula/mix-feeding mothers believed that formula made working easier. The family could feed the baby in the mother's absence. This is consistent with normative beliefs within the theory of reasoned action.

Breastfeeding mothers and formula-feeding mothers also indicated that it is traditional to follow their perception of family beliefs. This is consistent with subjective norms. However, with exposure to cultural and social differences on Guam, Chuukese mothers are challenging their decision-making practice, contributing to a cultural or social conflict.

Breastfeeding mothers also found a barrier to breastfeeding in public. In Chuuk, mothers commonly breastfeed in public. However, they believe they do not have control over breastfeeding in public on Guam. They believe it is not acceptable. A barrier is created when mothers do not feel control within the community environment.

Formula/mix-feeding mothers indicated a shift in control beliefs. They believed that breastfeeding was easy, and best for the baby. However, use of formula gives the mother a sense of independence, and a way to leave the baby with family while mother enjoys some time out of the house. Mothers felt challenged in weighing the advantages and disadvantages to breastfeeding.

***Lack of commitment.*** Breastfeeding mothers found lack of commitment as a barrier. One mother indicated lack of freedom with breastfeeding because it takes so much of her time. This led her to feel lack of control. Chin, Solomonik (2009), and Kemberling (1979) found that social structures within a woman's life were important, with vulnerable women less likely to breastfeed. These findings are consistent with the theory of reasoned action.

***Lack of support from community, family, and health care.*** This theme was found as a barrier to behavioral beliefs/attitudes, and control/perceived behavioral control, and was identified by the formula/mix-feeding mothers. Mothers felt lack of support from the community. Mothers indicated the need to work. They felt barriers to breastfeeding their babies when they had to work or go back to school. They found no place to feel safe or convenient to

breastfeed their babies. Clearly, either the mothers or the employers/school personnel were unaware of the Nana Yan Patgon Act (Yamashita and Rodriquez, 2013), which provides for this type of support.

Lack of family support was also voiced by one mother who perceived inadequate milk supply. She said that her mother told her to give formula to her baby. Without the support from her family to manage this common concern, she gave formula. Another mother indicated that she wanted to breastfeed, but her mother had died before the baby was born. Without her mother to help her, she gave up and fed formula to her baby.

Mother after mother indicated lack of support from health care staff. One mother indicated that she couldn't get the baby to latch on. Despite efforts by the staff in the hospital, and follow-up from WIC staff, she felt she had to give formula. She felt powerless. Several mothers indicated that they thought they did not have enough milk to breastfeed. The nurses then gave formula to the mothers to feed to their babies. Mother after mother indicated that even if they initially successfully breastfed, if they were discharged from the hospital prior to the baby's discharge, when they came to visit their baby, the nurses had already given formula. The baby wouldn't latch on, and no one helped them. Mothers felt distress.

Several mothers also discussed the use of formula. While they initially planned to breastfeed their babies, the nurses brought formula to them to give to the baby. Within the Chuukese culture, it is rude to refuse a gift, so they gave the formula. They also believed that since the nurse was the one to give the formula, it must be as good or even better than breastmilk. They fed the formula because they thought it was best for the baby.

*Lack of knowledge in managing common problems.* Mothers indicated that they gave formula when they believed that they did not have enough milk. They gave formula when

their nipples were sore or traumatized from breastfeeding. They gave formula when they couldn't get the baby to latch on. These are all common problems that can be managed with adequate knowledge and support. Neither the mothers nor the nurses attended to these common problems, and babies were then formula-fed. Mothers lacked the necessary knowledge to manage the problems. The nurses either lacked the knowledge, or lacked the time to work with mothers to establish and/or maintain lactation, or lacked the belief that breastfeeding mattered, perhaps a combination of these.

*Mixed messages.* Formula/mix-feeding mothers reported receiving many mixed messages. These mixed messages came from family, when mothers were told breastfeeding was best, but formula was also okay. Mixed messages also came from WIC, where mothers were encouraged to breastfeed, but formula was provided free of charge. Nurses in the hospital also sent mixed messages, and provided formula when mothers indicated their desire to breastfeed. Henderson and Redshaw (2010), and Winicoff, Laukaran, Myers and Stone (1986), found that consistent advice was very important in establishing successful breastfeeding. If mothers receive conflicting messages, they are confused as to what is best.

The theory of reasoned action was used to identify the facilitators and barriers to successful breastfeeding among migrant Chuukese mothers living on Guam. The demographic findings do not seem to predict intention to breastfeed. The components of the theory of reasoned action: 1) behavioral beliefs/attitude, 2) normative beliefs/subjective norms, 3) control beliefs/perceived behavioral control, and 4) intent were found to be helpful in this breastfeeding research study.

## Summary Discussion

The theory of reasoned action was used to identify facilitators and barriers to successful breastfeeding among migrant Chuukese mothers on Guam. The focus of data from the focus groups was on behavioral beliefs/attitudes, normative beliefs/subjective norms, control beliefs/perceived behavioral control, and intention.

**Behavioral beliefs/Attitudes.** The facilitators to breastfeeding related to behavioral beliefs/attitude included 1) knowledge acquisition, 2) attitude shaping, and 3) traditional values for the breastfeeding mothers. No facilitators were identified for formula/mix-feeding mothers in the behavioral belief category. Breastfeeding mothers acquired knowledge from trusted persons, with the maternal grandmother being the most important person. Person-to-person sharing of information was very important. Once knowledge was acquired, and benefits to breastfeeding were identified, attitudes were shaped to support breastfeeding intent. Breastfeeding being traditional in Chuuk, led to mothers growing up observing breastfeeding, and learning that breastfeeding was best for the babies, and adapting positive views of breastfeeding.

No barriers to breastfeeding related to behavioral beliefs/attitudes were identified by the breastfeeding mothers. Several barriers were identified by the formula/mix-feeding mothers, including 1) mixed messages, 2) lack of knowledge, and 3) lack of support from health care system or family. When the family supported formula supplementation, even if the mother thought breastfeeding was best, formula was given. Perhaps the mothers had a difficult time challenging family beliefs. Mothers also did not seem to have knowledge about the management of common problems. When mothers perceived problems, formula supplementation was a common remedy. This may also be related to perceived lack of support from health care staff

and family. If the mother experienced lack of support from others, when problems presented, breastfeeding failed. This was especially noted when the maternal grandmother was absent.

These findings related to facilitators support breastfeeding intent within the theory of reasoned action. The fact that no facilitators were identified by the formula/mix-feeding mothers further supports the theory of reasoned action in that breastfeeding success was not present with barriers identified.

**Normative beliefs/Subjective norms.** The facilitators identified by the breastfeeding mothers focused on traditional values. Breastfeeding is traditional in Chuuk, and the mothers believed that their families follow tradition, and expected that she should breastfeed her baby.

Barriers focused on cultural conflict/social change, and were voiced by both breastfeeding mothers and formula/mix-feeding mothers. Most mothers indicated the need to work on Guam. This represented a change from their lives on Chuuk. Families fed formula to the babies during the mother's absence. The breastfeeding mothers were able to limit the feeding of formula, but did allow family members to supplement if breastmilk was not available. No mothers seemed to know about the Nan Yan Patgon Act, which provides support for breastfeeding at the work site.

Another aspect of cultural conflict/social change was found in decision-making. Mothers indicated that on Chuuk, family guides decision-making. On Guam, the mothers were exposed to other cultural practices that included a broader approach to decision-making, allowing individuals to make decisions. Formula/mix-feeding mothers believed that formula feeding was more "Americanized", and they sought to have independence over family influence.

Again, lack of knowledge in managing common problems was identified. This led to mix-feeding by some mothers.

These findings related to facilitators support breastfeeding intent within the theory of reasoned action. The fact that no facilitators were identified by the formula/mix-feeding mothers further supports the theory of reasoned action in that breastfeeding success was not present with barriers identified.

**Control beliefs/Perceived behavioral control.** Facilitators identified include 1) family support, 2) confidence, and 3) traditional values by the breastfeeding mothers. No facilitators were identified by the formula/mix-feeding mothers. Family support was felt when family members cooked and completed household chores so that the mother could focus on breastfeeding. This allowed mothers to feel control over breastfeeding success and contributed to mothers developing confidence in having control over breastfeeding. Mothers also related feelings of control in the perception that members of their social network and family were available to help them through any challenges to breastfeeding. The breastfeeding mothers indicated they had grown up knowing about breastfeeding, so they felt that following the traditional values allowed them feelings of control over the breastfeeding experience.

Barriers to control were identified by both the breastfeeding mothers and the formula/mix-feeding mothers. Breastfeeding mothers felt uncomfortable breastfeeding in public on Guam, although they had no hesitation to breastfeed in public in Chuuk. They related this difference to their perception that breastfeeding in public was not accepted in Guam.

Formula/mix-feeding mothers indicated lack of support from the health care system, family, and community. Hospital practices did not support breastfeeding. Nurses provided formula, even if the mothers indicated they wanted to breastfeed. When problems were encountered, the solution by the nurses seemed to focus on providing formula. When mothers

and babies were separated, either following cesarean sections or early discharge of mothers, nurses gave formula. Mothers voiced frustration, and were reluctant to challenge the nurses.

Lack of support from family was identified by some of the mothers. They found themselves feeling fatigue needing to feed the baby at night after working all day. When they did not feel support to get adequate rest, they used formula.

Lack of support from the community was related to their perception that there was no place to safely and conveniently breastfeed in public or at work. Again, lack of awareness of the Nana Yan Patgon Act was apparent.

The formula/mix-feeding mothers also indicated barriers related to cultural conflict/social change. Again, challenges with work responsibilities led this problem. Mothers struggled with the social change that work posed to them.

These findings related to facilitators support breastfeeding within the theory of reasoned action. The fact that no facilitators were identified by the formula/mix-feeding mothers further supports the theory of reasoned action in that breastfeeding success was not present with barriers identified.

**Intention.** Both breastfeeding and formula/mix-feeding mothers indicated their intent to exclusively or partially breastfeed. This was related to traditional values, which encourages prolonged breastfeeding. However, work, pregnancy, and other life events were identified as factors that could shorten the breastfeeding experience.

These findings related to facilitators support breastfeeding intent within the theory of reasoned action. Even the mix-feeding mothers followed through with intent to continue partial breastfeeding as long as possible.

## **Limitations**

Several limitations were identified. They are listed.

- This was a qualitative study with a small sample size.
- Mothers knew this study focused on breastfeeding, which could have resulted in responder bias.
- The research focused only on Chuukese mothers living on Guam, and cannot be generalized outside of Guam.
- The study required the Chuukese mothers to be English-speaking. While all mothers were conversant in English, it was clear that they were much more comfortable speaking in Chuukese. Also, the non-English speaking mothers may have had other perspectives that were not identified.
- The study limited inclusion to Chuukese mothers who had lived on Guam five years or less. While this provides a view of breastfeeding with recently migrated Chuukese mothers, it does not provide information for mothers who live on Guam for longer periods of time.

## **Suggestions for Future Action to Increase Support for Breastfeeding**

- The findings should be shared with the health care community and the community of Guam as a whole.
- The findings should be shared with other states and jurisdictions where Chuukese mothers migrate.
- The findings should also be shared with other regional jurisdictions of Micronesia to see if there is interest related to their islands.

- This study found many facilitators and barriers to successful breastfeeding among migrant Chuukese mothers on Guam. Efforts to address the barriers to breastfeeding should be implemented on Guam. This includes policy development/revision, health care staff education, mother support, and initiation of lactation support services.
- This study found many barriers to breastfeeding related to health care system and staff. The findings should be shared with health care staff and administration to determine ways to address these barriers.
- One overwhelming finding from this study was that mothers felt very little support from health care staff. Staff did not know how to manage common problems, lacked the necessary experience to manage problems, or were overwhelmed with the overall responsibilities placed on them. Seminars and continuing education programs should be developed to address a variety of breastfeeding issues for health care staff.
- Mothers trusted family and social contacts for knowledge acquisition and support. Addressing the barriers identified in the study will require that mothers access prenatal care early, where they can receive peer-to-peer counseling. Work also needs to be done to establish breastfeeding support through churches, non-traditional leaders, and Chuukese women's councils.

### **Future Research**

- A study to discover what happens regarding breastfeeding with 2<sup>nd</sup> generation Chuukese mothers on Guam.

- A study to expand the population to include other cultural groups who are living on Guam.
- A replication study to include a probability sample of non-English speaking mothers.
- A study to determine similarities and differences in breastfeeding practices between Chuukese mothers who stay in Chuuk and those who chose to migrate.
- A study to determine the reason Chuukese mothers choose to migrate.
- A study to determine the knowledge, values, beliefs, and level of support about breastfeeding among fathers and other significant others.
- A study to determine how health care staff perceive their role in breastfeeding and to determine the motivations behind their seeming of lack of support.

### **Conclusion**

Based on these findings, a recommendation will be made to the Guam Department of Public Health and Social Services, Guam Memorial Hospital, Naval Hospital, Guam, and the soon-to-open Guam Regional Medical Center to consider breastfeeding policy to address barriers identified in this study.

A recommendation will be made to the Guam Department of Public Health and Social Services to ensure that the intent of the Nana Yan Patgon Act is addressed in all government agencies.

In addition, a recommendation will be made to the health care community to make efforts to add lactation support services to aid in ensuring that new mothers get the support and guidance that is needed to initiate and maintain lactation. These services need to include an understanding

of cultural similarities and differences. A lactation consultation department would also provide necessary education and support for nursing service staff.

Breastfeeding is such a critical strategy to begin life-long healthy habits for the residents of Guam. Time and effort to establish and maintain this simple health practice can have long-lasting positive effects on the health of the people of Guam and the surrounding area.

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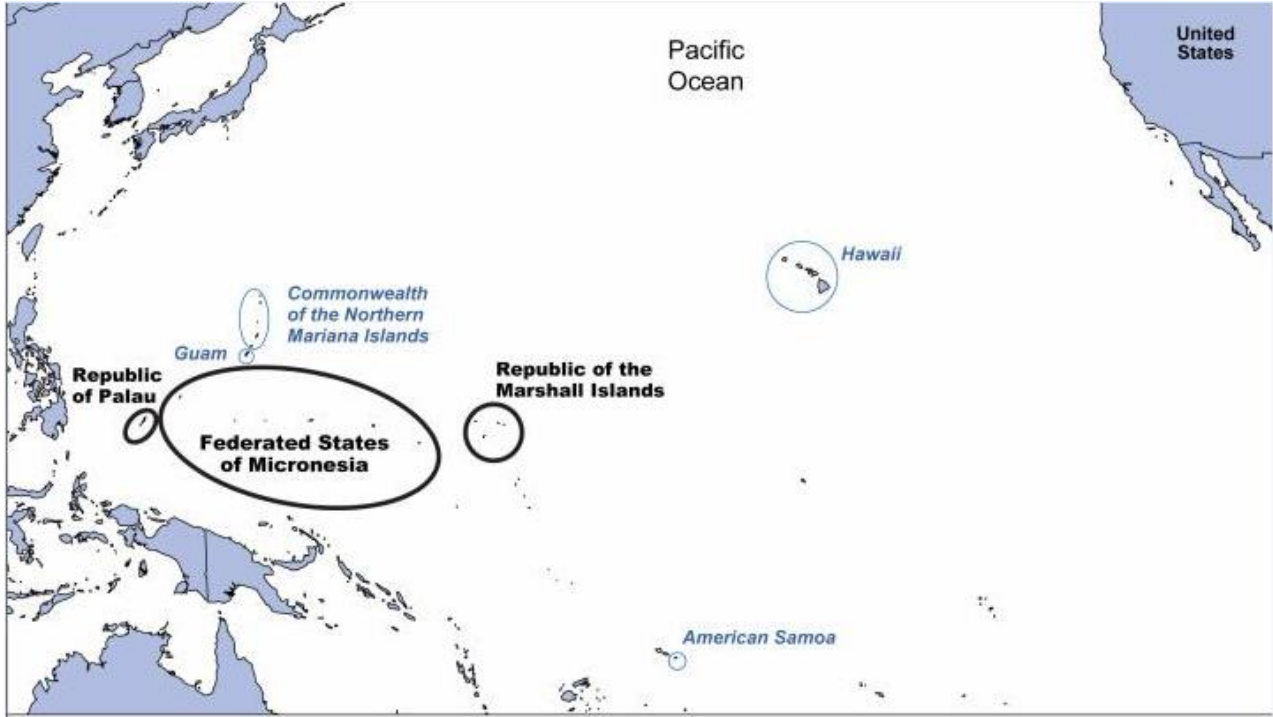
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APPENDIX A  
Map of USAPI



**Source: U.S. Government Accounting Office, Map Resources  
GAO, Guidelines Needed to Support Reliable Estimates of Cost Impacts of Growing Migration, Washington D.C. July 2013**

APPENDIX B  
Infant Feeding Demographic Data Tool  
Key Informants

Are you a:

- Breastfeeding mother?
- Formula feeding mother?
- Health care provider? Indicate type of provider \_\_\_\_\_

Age: \_\_\_\_\_ years

Current Marital Status:

- Married
- Single
- Living with Significant Other
- Widowed
- Divorced/Separated

Where do you live on Guam? \_\_\_\_\_

If you are originally from Chuuk, to which Chuukese Island do you most closely identify?

\_\_\_\_\_

How long have you lived in Guam? \_\_\_\_\_ Years, \_\_\_\_\_ Months

What is your highest level of education?

- Less than High School
- High School diploma
- Some College
- Associates Degree
- Bachelor's degree
- Master's degree or higher

What is the range of your total household income?

- less than \$10,000
- \$10,000 - \$19,999
- \$20,000 - \$29,999
- \$30,000 - \$39,999
- \$40,000 - \$49,999
- >\$50,000

**Guam Infant Feeding Key Informant Interview Guide Tool  
Health Care Professional**

1. Behavioral Beliefs - Do you believe that babies will grow and stay healthy no matter how they are fed [BF/FF]?
2. Attitude - Is [BF/FF] something that you view positively or negatively?
3. Normative Beliefs - How do you think others important to a mother think they should feed their baby?
4. Subjective Norms - How does what others think about how a baby should be fed influence a mother's decision to [BF/ FF]?
5. Control Beliefs - What things might make it easier or harder to [BF/FF]?
6. Perceived Behavioral Control - How easy or hard is it to [BF/FF] a baby?
7. Intention - How long do mothers tend to [BF/FF] their baby?
8. In summary, is there anything else you would like to add to the discussion?

**Guam Infant Feeding Key Informant Interview Guide Tool  
Breastfeeding Mothers/Non-Breastfeeding Mothers**

1. Behavioral Beliefs - Do you believe that [BF/FF] your baby will help your baby to grow and stay healthy?
2. Attitude - Is how you feed your baby something that you view as important or not important?
3. Normative Beliefs - How do you think your family or others who are important to you think you should feed your baby?
4. Subjective Norms - How does what others think about how you should feed your baby influence your decision to [BF/ FF]?
5. Control Beliefs - What things might make it easier or harder to [BF/FF] your baby?
6. Perceived Behavioral Control - How easy or hard is it for you to [BF/FF] your baby?
7. Intention - How long do you plan to [BF/FF] your baby?
8. In summary, is there anything else you would like to add to the discussion?

BF means breastfeed

FF means formula feed

Infant Feeding Demographic Data Tool  
Chuukese Mothers Living on Guam

Age: \_\_\_\_\_ years

Current Marital Status:

- Married
- Single
- Living with Partner
- Widowed
- Divorced/Separated

Does your baby's father live with you? \_\_\_\_\_

To which Chuukese Island do you most closely identify? \_\_\_\_\_

Where is the father of the baby from? \_\_\_\_\_

How long have you lived in Guam? \_\_\_\_\_ Years, \_\_\_\_\_ Months

What is your highest level of education?

- Less than High School
- High School diploma
- Some college
- Associates Degree
- Bachelor's degree
- Master's degree or higher

The highest level of education of the baby's father?

- Less than High School
- High School diploma
- Some College
- Associates Degree
- Bachelor's degree
- Master's degree or higher

Are you currently receiving assistance from the Women's Infant and Children Program (WIC)?

- Yes
- No

Where do you live?

- Single house
- Apartment or condominium
- Other \_\_\_\_\_

Who lives in your home with you now? (check all that apply)

- Husband or partner (indicate age \_\_\_)
- Sister (indicate # \_\_\_ and age of each \_\_\_\_\_)
- Mother (indicate age \_\_\_)
- Father (indicate age \_\_\_)
- Partners' Mother (indicate age \_\_\_)
- Partners' Father (indicate age \_\_\_)
- Brother (indicate # \_\_\_ and age of each \_\_\_\_\_)
- Female cousin (indicate # \_\_\_ and age of each \_\_\_\_\_)
- Male cousin (indicate # \_\_\_ and age of each \_\_\_\_\_)
- Aunt (indicate # \_\_\_ and age of each \_\_\_\_\_)
- Uncle (indicate # \_\_\_ and age of each \_\_\_\_\_)
- Grandmother (indicate # \_\_\_ and age of each \_\_\_\_\_)
- Grandfather (indicate # \_\_\_ and age of each \_\_\_\_\_)
- Son (indicate # \_\_\_ and age of each \_\_\_\_\_)
- Daughter (indicate # \_\_\_ and age of each \_\_\_\_\_)
- Other (indicate # \_\_\_ and age of each \_\_\_\_\_)

Do you know other breastfeeding mothers?

- No
- Yes - If yes, who are they (mother, sister, auntie, etc.) \_\_\_\_\_

Have you attended a breastfeeding support group?

- No
- Yes (who helped you to breastfeed? \_\_\_\_\_)

What village do you live in? \_\_\_\_\_

What is the range of your total household income?

- less than \$10,000
- \$10,000 - \$19,999
- \$20,000 - \$29,999
- \$30,000 - \$39,999
- \$40,000 - \$49,999
- > \$50,000

Running Head: BREASTFEEDING

**These questions refer to your history of pregnancies and infant feeding**

How old is your youngest baby? \_\_\_\_\_

How are you feeding this baby?

Only Breastfeeding

Breastfeeding and Formula Feeding

Breast feeding and other type of food such as juice, water, solid food (explain: \_\_\_\_\_)

Formula Feeding

If you are combining breastfeeding with formula feeding, how many times a day do you breastfeed? \_\_\_\_\_

AND how many times a day do you give formula? \_\_\_\_\_

How many pregnancies have you had? # \_\_\_\_\_

How many live babies have you delivered? \_\_\_\_\_

Of the live babies, how did you feed them?

During the first month, did you

Baby #	Breastfeed only	Breastfeed with Formula	Formula feed only	If you breastfed, how many months?
Baby #1				
Baby #2				
Baby #3				
Baby #4				
Baby #5				
Baby #6				
Baby #7				
Baby #8				

If you breastfed only, at what age did you add other foods or liquids? \_\_\_\_\_

**These questions refer to your prenatal care and delivery**

Did you see a provider regularly during your most recent pregnancy (called prenatal care)?

Yes

No

How many months were you pregnant when you had your first pre-natal care visit? \_\_\_\_\_

If yes, what type of provider (check all that apply)

- Physician
- Nurse midwife
- Lay midwife
- Other: \_\_\_\_\_

After your first prenatal visit, how often did you go back for care? \_\_\_\_\_

Where did you receive most of your prenatal care?

- Public Health Clinic
- Private Provider Office
- Private Clinic group
- Other - Describe where you received most of your prenatal care \_\_\_\_\_

Where did you deliver your baby?

- Guam Memorial Hospital
- Sagua Managu
- Home
- Other \_\_\_\_\_

How were your babies born?

Baby #	Vaginally	Cesarean Section
Baby #1		
Baby #2		
Baby #3		
Baby #4		
Baby #5		
Baby #6		
Baby #7		
Baby #8		

**Guam Infant Feeding Focus Group Interview Guide Tool  
Breastfeeding Mothers or Non-Breastfeeding Mothers**

1. Behavioral Beliefs - Do you believe that [BF/FF] your baby will help your baby to grow and stay healthy?
2. Attitude - Is [BF/FF] your baby something that you view as important/not important?
3. Normative Beliefs - How do you think your family or other people who are important to you think you should feed your baby?
4. Subjective Norms - How important to you are other people's beliefs about how you should feed your baby?
5. Control Beliefs - How much power or influence do you have over how easy or hard it is to feed your baby?
6. Perceived Behavioral Control - How easy or hard is it for you to [BF/FF] your baby?
7. Intention - How long do you plan to [BF/FF] your baby?
8. In summary, is there anything else you would like to add to the discussion?

BF means breastfeed

FF means formula feed

APPENDIX C  
**University of Hawai'i**  
**Consent to Participate in Research Project**

*Facilitators and Barriers to Successful Breastfeeding Among  
Chuukese Mothers Who Have Migrated to Guam*

My name is Kathryn Wood. I am a graduate student at the University of Hawaii at Manoa (UH) in the School of Nursing and Dental Hygiene. As part of the requirements for earning my graduate degree, I am doing a research project. The purpose of the project is to document the factors that affect successful breastfeeding. I am asking you to participate because you recently gave birth to a baby on Guam.

**Activities and Time Commitment:** If you participate in this project, I will meet with you at a location and time convenient for you. The interview will consist of filling out a form on background information about yourself which includes 26 questions, which will take no more than 5-10 minutes to complete. An interview will follow with you and 3-5 other mothers who have recently given birth. There will be 32 questions in the interview, and will take about 1 – 1 1/2 hours to complete. Questions will focus on what you and the other mothers found to be helpful, and unhelpful in your breastfeeding experience. Data from the surveys and interviews will be summarized into broad categories. No personal identifying information will be included with the research results. I will record the interview so that I can later analyze the responses. I will conduct several interviews with other mothers as well. You will be one of about 50 people whom I will interview for this study. To compensate for the time you gave to the project, you will receive a modest incentive at the completion of the interview.

**Benefits and Risks:** There will be no direct benefit to you for participating in this interview. I hope, however, that the results of this project will help other mothers who wish to breastfeed their babies. I believe there is little or no risk to participating in this research project. Participating in this research may be of no direct benefit to you. It is believed, however, the results from this project will help future mothers to have a successful breastfeeding experience. If however, you become stressed or uncomfortable answering any of the interview questions or discussing topics with me during the interview, we can skip the question, or take a break, or stop the interview, or withdraw from the project altogether.

**Privacy and Confidentiality:** During this research project, I will keep all data in a secure location. Only my University of Hawaii advisor and I will have access to the data, although legally authorized agencies, including the UH Human Studies Program, can review research records. After I analyze the interviews, I will erase/destroy the recordings. When I type and report the results of my research project, I will not use your name or any other personally identifying information. Rather, I will use fake names and report my findings in a way that protects your privacy and confidentiality to the extent allowed by law.

**Voluntary Participation:** Your participation in this research project is completely voluntary. You may choose freely to participate or not to participate. In addition, at any point during this

project, you can withdraw your permission without any penalty of loss of benefits.

Questions: If you have any questions about this project, please contact me via phone at (671) 687-1732 or e-mail [kmwood@hawaii.edu](mailto:kmwood@hawaii.edu). If you have any questions about your rights as a research participant in this project, you can contact the University of Hawai'i, Human Studies Program by phone at (808)956-5007 or by e-mail at [uhirb@hawaii.edu](mailto:uhirb@hawaii.edu).

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**Signature(s) for Consent:**

I agree to participate in the research project entitled, *“Facilitators and Barriers to Successful Breastfeeding Among Chuukese Mothers Who Have Migrated to Guam”*. I understand that I can change my mind about participating in this project, at any time, by notifying the researcher.

**Your Name (Print):** \_\_\_\_\_

**Your Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

I certify that I have explained the contents of the consent document to the participant, and am confident that the participant understands its content.

Printed Name	Signature of Interviewee	Date

Printed Name	Signature of Researcher	Date

A copy of this document will be provided to the participant.