BREASTFEEDING SUPPORT ACROSS DIFFERENT SOCIO-DEMOGRAPHIC GROUPS OF SOCIETY-A STUDY FROM MINNESOTA

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Breastfeeding is the most natural, optimal, and unmatched method of infant feeding for proper growth and development. In the United States, initiation rates have increased but that number does not illustrate the significant disparities in breastfeeding duration rates that persist across different socio-demographic backgrounds. Many factors contribute to the decision of whether to breastfeed or formula feed, and adequate societal maternal support towards breastfeeding practices can be a strong contributing factor.

The primary objective was to assess the association between maternal socio-demographic characteristics and breastfeeding support from family and friends, health care, the workplace, childcare providers, and community and public settings.

Cross-sectional data was collected for 91 participants receiving postnatal care at a women's health clinic in Coon Rapids, Minnesota. Data was obtained using structured quantitative questionnaires on maternal socio-demographic characteristics, feeding practices, and perceived societal breastfeeding support. Data analysis involved descriptive information on the participant's characteristics and a cross-tabulation for frequency and percentages of breastfeeding practices, and support across different socio-demographic groups.

Unmarried mothers received less support from their child's father, were less likely to receive sufficient information about breastfeeding support groups and services from health care, and were more commonly faced with unpaid maternity leave. All but one mother from the highest household income category reported receiving sufficient information about breastfeeding support groups and services from their health care. Paid maternity leave was more common for mothers 30 and older and had a tendency to be more frequent for mothers who were more educated and who were in a managerial or professional position. Higher educated mothers reported a greater tendency of workplace support from their employer and co-workers. Unexpectedly, ethnic minorities perceived higher support from their childcare provider compared to non-Hispanic white mothers. Over half of breastfeeding mothers did not feel comfortable breastfeeding in public places. Reasons to choose formula feeding included: personal feeding preference, formula feeding is easier, mother planned to return to work, mother believed formula feeding is as good as breastfeeding or that formula is better, and mother wanted the infant's father to help with feeding.

Preliminary data illustrated that feeding practices such as feeding choice, exclusive breastfeeding and any breastfeeding are undoubtedly associated with socio-demographic characteristics. It is also clear that not all breastfeeding mothers perceive support similarly

throughout their societal environments and some socio-demographic groups reported more support than others. A larger study is needed to draw an accurate conclusion on overall disparities in support for breastfeeding mothers of different socio-demographic backgrounds.

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ABBREVIATIONS

AAP- American Academy of Pediatrics

ADA- American Dietetic Association

BLS- Bureau of Labor Statistics

CCP-Childcare Provider

CDC- Centers for Disease Control Prevention

CLC- Certified Lactation Counselor

DPHP- Office of Disease Prevention and Health Promotion

ECE- Early Care and Education

EU- European Union

FLSA- Fair Labor Standards Act

FMLA- Family Medical Leave Act

GED- General Educational Development

IBCLC-International Board Certified Lactation Consultant

IFPS II- Infant Feeding Practices Study II

ILO- International Labour Organization

IRB- Institutional Review Board

mPINC-Maternity Practices in Infant Nutrition and Care (survey)

NIS- Centers for Disease Control Prevention National Immunization Survey

NNR- Nordic Nutrition Recommendation

NCSL- National Conference of State Legislation

PFL- Paid Family Leave

UNICEF- United Nations Children's Fund

USBC- United States Breastfeeding Coalition

USDHHS- United States Department of Health and Human Services

USDL- United States Department of Labor

WHO- World Health Organization

WIC- Participants of Special Supplemental Nutrition Program for Women, Infants, and Children

Contents

1. INTRODUCTION

Infancy holds as the most significant stage in the life cycle when development and growth rely heavily on adequate nutritional uptake. Breastfeeding is an unmatched method of ensuring optimal nutrition for the proper growth and development of infants and is the most natural and optimal form of infant feeding. Exclusive breastfeeding is the recommended form of infant feeding for the first six months of life (WHO/UNICEF 2003, Agostoni et al. 2009, AAP 2012). Breastfeeding provides long-term and short-term benefits to both the infant and mother and is associated with improved infant and child morbidity and mortality (ADA 2009, AAP 2012). Concerning infants, breastfeeding is associated with a decreased risk of otitis media, gastroenteritis, respiratory illness, sudden infant death syndrome, necrotizing enterocolitis, obesity, and hypertension. Maternal short-term and long-term benefits include reduced risk of breast and ovarian cancer, type 2 diabetes, and postpartum depression (WHO/UNICEF 2003, USDHHS 2011).

All in all, breastfeeding initiation rates in the United States have increased significantly in the last few decades. A 2013 survey done by the Center for Disease Control and Prevention (CDC), reported hospital initiation rates for children born in 2011 to be 79.2%, therefore meeting the Healthy People Targets 2010 of 75% (DPHP 2014), but only 40.7% of babies were exclusively breastfed at three months and only 18.8% at six months of age (CDC 2013a). The latter of the two numbers is far below the Healthy People 2020 goal of 25.5% at six months for exclusive breastfeeding (DPHP 2014). According to the CDC, in 2014, Minnesota had a breastfeeding initiation rate of 89.2%; however, only 23.5% of mothers continued to breastfeed exclusively through the first six months of their baby's life (CDC 2014a).

While increases in breastfeeding initiation have been seen in the last few decades, only slow progress, if any at all, has been seen across duration of any breastfeeding and exclusive breastfeeding (AAP 2012). The reasons influencing a mother's decision to breastfeed or formula feed are many, and often these decisions are made even before conception or during pregnancy (ADA 2009, Brenner & Buesher 2011). Considerations such as knowledge and education, beliefs and attitudes of mothers and their families, access to breastfeeding support,

hospital support and practices, and postpartum employment are all important determinants of initiation, duration and exclusivity of breastfeeding (CDC 2006, ADA 2009). The conditions that allow for continued breastfeeding durations have much to do with the mother's support systems starting before pregnancy and throughout postpartum.

As illustrated above, based on initiation rates, many mothers have the intention and desire to breastfeed their babies at birth, however, the breastfeeding continuation rates exemplify the many barriers women face in sustaining their breastfeeding practices. Breastfeeding initiation and continuation rates differ significantly by race/ethnicity, socioeconomic, and other demographic characteristics. Even though initiation rates have increased the number does not illustrate the significant disparities in breastfeeding duration rates that persist within the aforementioned subgroups or the barriers which have a more prominent impact deterring these mothers' success of continued breastfeeding durations (CDC 2006, Kogan et al. 2008, ADA 2009).

While breastfeeding is the most natural form of infant feeding, it is also a learned skill. Essentially all women are capable of breastfeeding as long as they are educated on the skills needed to succeed and are given support from their families, communities, workplace and health care system (WHO/UNICEF 2003). Despite the overwhelming evidence supporting breastfeeding, a large portion of mothers choose to formula feed their babies. Many factors contribute to this decision, but unfortunately the decision to formula feed is commonly an outcome driven by a lack of societal maternal support towards breastfeeding practices (USDHHS 2011). It has become apparent that more research is needed to better understand how mothers of different socio-demographic backgrounds receive support from the society around them.

2. LITERATURE REVIEW

The first part of this section will describe the composition of breast milk and why it is important and beneficial to both the mother and the infant. In addition, sections such as feeding recommendations, and mother's perceptions and attitudes towards breastfeeding in the United States, and the support systems that surround them, will follow.

2.1 Breast milk composition

Breastfeeding is an unmatched method of ensuring optimal nutrition for the proper growth and development of infants and is the most natural and optimal form of infant feeding (WHO/UNICEF 2003). Digestive enzymes are not fully developed in young infants but breastfeeding is believed to help promote digestion as well as develop stomach function due to biologically active substances called trophic factors, such as epidermal growth factor (Dvorak 2010, Walker 2010). Breast milk has a very unique composition specifically developed to supply infants at all stages with all essential nutrients in sufficient amounts. The composition of breast milk changes throughout the duration of lactation. Breast milk is extremely complex and is derived of more than 200 known components, which include protein, essential fatty acids, lactose, vitamins, minerals, other immune-related components, enzymes, hormones, polyamines, and other biologically active compounds — all of which are essential to the growth and development and play a significant role in health promoting and protective factors linked to breastfeeding (Agostoni et al. 2009). The main components of breast milk are the same in all women; however, it is the concentration of each nutrient that varies substantially. The composition of breast milk changes continuously throughout all stages of prenatal and postnatal development and is modified based on the nutritional needs of the changing phases during the growth of the infant (Zimmermann 2001, Butte et al. 2002, Ballard & Morrow 2013).

2.1.1 Macronutrients

Fats, carbohydrates and protein are used as the main sources of energy. Protein and carbohydrate volumes stay rather consistent between mothers during lactation, whereas fat tends to vary between individual women (Butte et al. 2002, Agostoni et al. 2009). Protein's role in infant development is strictly for tissue growth, and should comprise 0.9 to 1.2 g/dL in

mature breast milk (Ballard & Morrow 2013). The protein derived from breast milk provides the infant with an abundance of amino acids, many of which are indispensable and are essential during infancy (Zhang et al. 2013). Fatty acids, like omega-3 and omega-6 fatty acids, are important for development of the brain, vascular systems, and retina in early months of life (Huffman et al. 2011). The fat composition of full-term mature breast milk is between 3.2 to 3.6 g/dL (Ballard & Morrow 2013). Carbohydrate digestion and absorption is limited at this stage and breast milk supplies carbohydrates in the form of lactose and oligosaccharides (McVeagh & Miller 1997). Lactose concentrations vary the least out of the macronutrient content of breast milk. Lactose content varies from 6.7 to 7.8 g/dL (Ballard & Morrow 2013). Lactose contains glucose and galactose, and oligosaccharides contain galactose and sialic acid, the last two of which are essential nutrients in the development of the central nervous system (Wang 2009, Lawrence & Lawrence 2011).

2.1.2 Vitamins and minerals

As mentioned earlier, the nutritional needs of a normal birth weight baby can be met by human milk alone for the first six months with few exceptions. Minerals, which are an exception to this, are zinc and iron. Additional iron sources, in the form of cereal, formula, or meat, may be needed by some infants around six months old due to low concentrations of iron in the mother's breast milk (Ziegler et al. 2014). Vitamins also play a key role in an infant's diet. Most vitamins, as well as minerals, are available in abundant amounts in breast milk, assuming the mother is well nourished. Deficiencies for exclusively breastfed infants are rare but can occur if the mother`s diet is deficient (Greer 2001, Dewey et al. 2003). Two exceptions to this are vitamin K and vitamin D, which require supplementation during infancy (Greer 2001).

2.1.3 Fluids

Hydration and fluid intake is not to be overlooked. During illness, breast milk intake is usually maintained and therefore helps to sustain hydration (Dewey et al. 2003). Dehydration can occur easily in infancy. Fluid intake should increase with age from 700-855g/day from ages one to six months, (Butte et al. 2002); and during the first six months breast milk alone should supply sufficient amounts of fluid for hydration (Butte et al. 2002 & Barasi 2003).

2.2 Breastfeeding recommendations

Without adequate nutrition infants will not reach their growth and developmental potential. After birth, mothers have the choice to breastfeed or formula feed their baby, however, nutritional adequacy in infancy plays an important role throughout the baby's lifelong health and wellbeing. It is recommended, to ensure optimal health, growth, and behavioral development, that the infant be exclusively breastfed for the first six months of life (Dewey et al. 2003,WHO/UNICEF 2003, Agostoni et al. 2009, AAP 2012). Exclusive breastfeeding means the child should be given no other liquids or foods, other than breast milk, but can be supplemented with vitamins, minerals, and medications (NNR 2012). According to UNICEF (2010), breastfed babies have a much lower risk of developing gastro-intestinal infection, respiratory infections, necrotizing enterocolitis, ear infections, allergic disease, sudden infant death syndrome, and childhood leukemia, when compared to non-breastfed infants.

2.3 Breastfeeding in the United States

The United States is one of only four countries worldwide, without a policy for required paid maternity leave (USDHHS 2011). The Family Medical Leave Act (FMLA) is legislation, which requires that large businesses and employers, those with 50 employees or more, provide 12 weeks of job-protected leave. However, this is unpaid time off, which places financial burdens on many families trying to do what is best for their infant, and financially what is best for the family. Only five out of 50 states guarantee paid maternity leave from their temporary disability fund. California and New Jersey are the only two states that now provide paid leave specifically for "bonding with a newborn or newly adopted infant" (USBC 2010). Without the support of legislature in place for paid maternity leave, it is that much more imperative to receive lay, peer, and professional support from all components of society.

In addition to the topic of maternity leave, federally since 2010, under Section 7 of the Fair Labor Standards Act (FLSA), unpaid break time for breastfeeding mothers at the workplace is required. However, "Employers with fewer than 50 employees are not subject to the FLSA break time requirement if compliance with the provision would impose an undue hardship" (USDL 2013). Therefore, in the United States, if a mother is working for a smaller company

she is placed at a disadvantage regarding continued breastfeeding after return to work. Table 1 summarizes the components of the FLSA: Reasonable Break Time for Nursing Mothers.

The current breastfeeding situation in the United States doesn't solely reflect the working environment or laws and legislation, but is also strongly influenced by today's formula feeding culture. In countries with high initiation rates and durations of exclusive and any breastfeeding, such as the Nordic countries (Cattaneo 2009) breastfeeding is socially considered normal and women are given the opportunity to witness their peers and other breastfeeding women before they try to breastfeed themselves. This may give new mothers the confidence they need to attempt to breastfeed, as well as feeling comfortable reaching out for professional and lay support. In societies where breastfeeding is not a socially normal behavior, such as the United States, women may find it challenging to breastfeed and are put at a disadvantage because they may struggle with a serious lack of support to continue breastfeeding. Maternal support can be seen throughout multiple facets, such as information, encouragement, reassurance, services, and simply the opportunity to discuss problems and ask questions (Renfrew et al. 2012). In the United States, the strong culture, or social norm of formula feeding, poses different concerns when trying to address a new mother's needs. Two very clear issues are "the availability of timely, appropriate support to manage breastfeeding problems and issues and, the perception in the United States that the primary function of the breast is sexual" (Dowling 2005). In reference to addressing the issues of support, these commonly relate to the lack of support and knowledge of breastfeeding practices by family and friends, in addition to poor consistency and availability of the health care professionals after the mother and baby have been discharged from the hospital (Dowling 2005).

Table 1. United States Federal Law concerning Lactation Accommodations by Employer and Workplace

1) Employer must provide-
    a. "A reasonable break time for an employee to express breast milk for her nursing child for 1 year after the child's birth each time such employee has need to express the milk
    b. a place, other than a bathroom, that is shielded from view and free from intrusion from coworkers and the public, which may be used by an employee to express breast milk- it must be available when needed in order to meet statutory requirements"
2) "Employers are not required to compensate nursing mothers for breaks taken for the purpose of expressing breast milk, however, where employers already provide compensated breaks, an employee who uses that break time to express milk must be compensated in the same way that other employees are compensated for break time."
3) "Employers with fewer than 50 employees are not subject to the FLSA break time requirement if compliance with the provision would impose an undue hardship. Whether compliance would be an undue hardship is determined by looking at the difficulty or expense of compliance for a specific employer in comparison to the size, financial resources, nature, and structure of the employer's business. All employees who work for the covered employer, regardless of work site, are counted when determining whether this exemption may apply."

Source: Section 7 of the Fair Labor Standards Act of 2010: Reasonable Break Time for Nursing Mothers (USDL 2013)

2.4 Breastfeeding in Minnesota

Minnesota passed State legislation in 1998, which protects breastfeeding mothers in the workplace. The current legislation 181.939 Nursing Mothers can be seen in Table 2.

Table 2. Minnesota Legislation for Lactation Accommodations in Workplace

1) "An employer must provide reasonable unpaid break time each day to an employee who needs to express breast milk for her infant child. The break time must, if possible, run concurrently with any break time already provided to the employee. An employer is not required to provide break time under this section if to do so would unduly disrupt the operations of the employer."
2) "The employer must make reasonable efforts to provide a room or other location, in close proximity to the work area, other than a bathroom or a toilet stall, that is shielded from view and free from intrusion from coworkers and the public and that includes access to an electrical outlet, where the employee can express her milk in privacy. The employer would be held harmless if reasonable effort has been made."
3) "For the purposes of this section, "employer" means a person or entity that employs one or more employees and includes the state and its political subdivisions."
4) "An employer may not retaliate against an employee for asserting rights or remedies under this section."

Source: The Office of the Revisor of Statutes-2014 Minnesota Statutes: 181.939 Nursing Mothers, USDL 2013

Other Minnesota statutes, such as 617.23 Indecent Exposure, exempt breastfeeding women from being charged with indecent exposure. Therefore, it is not a violation of Statute 617.23 to breastfeed in public. However, not all women are protected under a similar legislation across all states.

Healthcare practices in the United States differ by state and even by individual hospital. The 2014 edition of the CDC's breastfeeding report card, based on the CDC Immunization Survey (NIS), presents these practices by individual state and on a national level. Table 3 displays statistics on the United States and Minnesota comparatively, and Table 4 demonstrates the current situation in the United States and Minnesota pertaining to federal and state laws, policies, and regulations that protect breastfeeding mothers. If not recognized as a federal law these may all differ based on the state.

Table 3. Breastfeeding and healthcare practices in the United States and Minnesota

	United States	Minnesota
Percentage ever breastfed	79.2	89.2
Percentage exclusively breastfed at 3 months	40.7	48.5
Percentage of live births occurring at Baby-Friendly Facilities	7.79	8.23
Percentage of infants receiving formula before 2 days old	19.4	15.9
Number of IBCLCs per 1,000 live births	3.48	4.58
Number of CLCs per 1,000 live births	3.84	7.88
Percentage of nurses/birth attendants never assessed for competency in breastfeeding management and support (mPINC)	27.1	43.0

Abbreviations: CLC- Certified Lactation Counselor and IBCLC-International Board Certified Lactation Consultant
Sources: CDC 2014a, CDC 2014b

Table 4. Breastfeeding laws, policies, and regulations in the United States

	United States	Total number of States with law	Minnesota
Law that specifically allow women to breastfeed in any public or private location	No	46	Yes
Law which exempts breastfeeding from public indecency laws	No	29	Yes
Laws related to breastfeeding in the workplace	Yes	25	Yes
Law exempting breastfeeding mothers from jury duty or allow jury service to be postponed	No	16	No
Implemented or encouraged the development of a breastfeeding awareness campaign	No	5	Yes
State's childcare regulations supports onsite breastfeeding	No	7	No
Public/ Private University lactation policy	No	X	No

Source: NCSL 2014

2.5 Breastfeeding practices across different socio-demographic groups

In the United States, breastfeeding rates differ among a majority of the states. For years, disparities in breastfeeding patterns have prevailed within socio-demographic groups. Breastfeeding rates tend to mimic other socioeconomic disparities and inequalities seen throughout society. Initiation and duration are highest among white mothers 30 years and older with higher education and higher income levels (Li et al. 2005a, Jones et al. 2011). This pattern is seen throughout many studies; for example, younger age, lower education, lower income, fewer family and friends who breastfed, and intent of returning to work postpartum, as well as other variables, were associated with early cessation of breastfeeding by six weeks, in a study including 1907 mothers (DiGirolamo et al. 2008).

2.5.1 Income

Previous studies indicate that low-income mothers are aware of the health benefits that breastfeeding provides but face too many obstacles and barriers to sustain breastfeeding, these may include a lack of support from family and friends, time constraints of needing to be back at work or school, unsatisfactory living environments, and the inability to obtain information and services within health care settings (Li et al. 2005a). Participants of Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) who come from a low-income household versus a higher income household have breastfeeding initiation rates of 67.5% and 84.6%, respectively (CDC 2013a).

2.5.2 Employment

In the United States, not all people are entitled to employer provided "family-friendly" benefits. Low-wage employees not only make less money than higher-wage employees, but typically they also lack employer provided benefits such as paid maternity leave, paid sick leave, paid vacations and holidays, and health insurance. In contrast to low-wage workers, higher-wage employees like professionals and managers, have a higher salary or hourly wage and are more frequently provided with a secure set of employee benefits (Appelbaum & Milkman 2011). Occupation can also be significant to breastfeeding initiation and duration. Kimbro (2006) reported that mothers who hold professional jobs and stay-at-home mothers have longer breastfeeding durations than mothers from other job types. The status of a

mother's employment also plays a role in her breastfeeding practices. Regardless of socioeconomic background, mothers who work full time have significantly lower breastfeeding rates while in the hospital after birth, compared to those mothers who work part time or were unemployed. Ryan et al. (2006) found that initiation rates in unemployed mothers were 1.28 times higher than in those mothers working full time, and part-time employed mothers had initiation rates that were 1.26 times higher when compared to those that are full-time employed.

According to literature, compiled in the Surgeon General's Call to Action to Support Breastfeeding, employed mothers not only have a shorter duration of breastfeeding but also have lower initiation rates to begin with. Initiation rates and duration both increase in mothers, who work part time, have workplace support programs, and longer maternity leave (USDHHS 2011). Another study by Roe et al. (1999) showed that maternity leave significantly affects the duration of breastfeeding and that for each additional week of maternity leave, the mother's duration of breastfeeding increased by about three days. In 2004, California was the first state in the United States to implement a paid family leave (PFL) program. Huang and Yang (2015) used data from the Infant Feeding Practices Study II (IFPS II) to assess changes in California's breastfeeding practices after the PFL was implemented. Overall, they discovered a 10 to 20% increase in breastfeeding at numerous intervals.

2.5.3 Age

For years studies have reported age as a determinant of feeding practices. An early study by Roe et al. (1999) found maternal age to be positively correlated to duration of breastfeeding and with each addition year of age the duration of breastfeeding increased. In the United States, age-related differences in rates are also observed, only 59.7% of mothers 20 years and younger initiated breastfeeding, whereas mothers older than 30 years had an initiation rate of 79.3% (CDC 2013a). A mimicked trend, in breastfeeding initiation and duration, is seen throughout much of research where the older the mother the higher the likelihood of initiation and duration of breastfeeding. In other studies such as, Lu et al. (2001) 55% of mothers age 25 and younger initiated breastfeeding compared to 73% of mother 30 and older. A 2011 study using, the 2007 National Survey of Children's Health, included 25 197 participants and

illustrated the same pattern, mothers 30 years and older were twice as likely to exclusively breastfeed than their 20-year-old and younger counterparts (Jones et al. 2011). In a review by, Thulier & Mercer (2009), many studies depicted maternal age to have a positive association to breastfeeding duration while some even claimed maternal age to be a predominant determinant of breastfeeding duration.

2.5.4 Marital status

Thulier & Mercer (2009) found marital status to be another demographic which is highly influential to breastfeeding incidence and duration. Data from previous published work revealed breastfeeding took place more commonly among married women, and that overall they have a higher initiation and duration compared to unmarried mothers. Another study done in the United States illustrated the same results; exclusive breastfeeding between married mothers and unmarried mothers was statistically different at one week, one month, three months, and six months (Li et al. 2005a). Ogbuana et al. (2009) reported similar finding regarding breastfeeding initiation. The family structure is also expected to influence feeding practices. Breastfeeding is more commonly witnessed in children of two parent families, as opposed to single mother households and stepparent households (Jones et al. 2011, Kim & Gallien 2014). Kim & Gallien (2014) reported single-mother status as an independent risk factor for lower breastfeeding practices of all types and durations regardless of income level, and after controlling for socio-demographics, employment and type of childcare.

2.5.5 Education

Mother's who are college graduates have 21% higher initiation rates than mothers with only a high school education. Additionally, 22% more breastfed until six months and 9% more breastfed exclusively at six months when compared to mothers with only a high school education (Li et al. 2005a). Jones et al.'s (2011) findings support the previous study, observing that mothers who had more than a high school education had much higher breastfeeding initiation rates. However, the majority of the subjects in this study fall under the following demographics: 25–34 years old, white, and had education beyond high school, which does not represent the population in which disparities are commonly seen.

2.5.6 Ethnicity

The same inconsistencies seen throughout other health factors can be seen within breastfeeding practices across different racial and ethnic groups. Hispanic and Latino mothers have an initiation rate of 80.6% compared to non-Hispanic black or African American mothers whose rate is 58.1%. Even with individual disparities present between the different socio-demographic groups, breastfeeding rates tend to decrease drastically in combined subpopulations; low-income non-Hispanic black mothers have a breastfeeding initiation rate of only 37% (CDC 2013a).

In a 2006 Morbidity and Mortality Weekly Report, it is noted that in association to breastfeeding status, race is independent of socioeconomic status and other demographic factors; and inversely socioeconomic and demographic factors are independent of race. It is imperious to consider all variables as independent in regards to their inherent role in breastfeeding (CDC 2006).

2.6 Breastfeeding support

Worldwide, the role of a strong support system is known to be very influential in the road to successful breastfeeding duration (EU 2008, USDHHS 2011). In order to increase duration and decrease disparities, focus needs to move from individual maternal behavior changes to acknowledging and addressing the social obstacles and difficulties mothers face in everyday life. For this purpose, The United States Department of Health and Human Services (USDHHS) released the Surgeon General's Call to Action on Breastfeeding (2011). The Call to Action highlights the roles and responsibilities of all people in society in order to improve breastfeeding support across six main sectors of society: mothers and family members, communities, health care, employment, research and surveillance, and public health infrastructure. The European Union (EU) released a similar report with the same conclusion; employers, health workers, the public, fathers and families need to be targeted to ensure adequate and appropriate support for mothers after discharge from their birthing health center (EU 2008).

In a review by Thulier & Mercer (2009), support from maternal employment, partners, and professionals are three of the most influential social variables affecting breastfeeding. In a Cochrane review, which assessed the effectiveness of support for breastfeeding mothers across 52 different studies completed in high, low, and low-to-middle income countries, it was found that the duration for both exclusive and any breastfeeding was increased significantly with all forms of extra support. The review noted that peer or lay and professional support was more effective than solely professional, and when executed together the combined support increased the duration of any breastfeeding significantly (Renfrew et al. 2012). It is also important to note that both negative and neutral attitudes from the maternal social network can obstruct a woman from initiating breastfeeding (Odom et al. 2014).

In a United States study that examined the effects of state-implemented laws, which protect a mother's right to breastfeed in both public and private locations, the odds ratio of ever breastfed infants was 43% higher in states that had these laws. States with laws supportive of breastfeeding, such as exempting mothers from jury duty, implementation and encouragement of breastfeeding awareness campaigns, enforcement of workplace pumping laws, and mandatory private pumping areas with break time at work, witnessed a larger proportion of infants ever breastfed. Laws increased the odds of ever breastfeeding and if the state had enforcement provisions for workplace pumping laws the odds ratio was even higher, 225%. The odds ratio of ever breastfeeding in states where breastfeeding mothers were exempt from jury duty was 81% greater than those states without this law (Smith-Gagen et al. 2014). However, the nature of the data cannot depict whether higher odds of breastfeeding is due to an encouraging breastfeeding culture in those states or if the law itself is influential.

2.6.1 Family support

Involvement of fathers in the breastfeeding process is crucial to enhance breastfeeding practices. Paternal support and companionship are proven to positively affect breastfeeding practices (WHO/UNICEF 2003, Wolfberg et al. 2004, Odom et al. 2014). In 2004, Wolfberg et al. conducted a randomized controlled trial to compare the effectiveness of expectant father's participation on how it influences a mother's decision to breastfeed. Results show that couples in the intervention group, in which the father attended informative breastfeeding

classes and discussions, had a breastfeeding initiation rate of 74% compared to only 41% in the control group. The study also showed an increase in breastfeeding practices during the baby's first month of life when the infant's maternal grandmother believed the baby should be breastfed (Wolfberg et al. 2004). The father's and maternal grandmother's opinion and perception of feeding practices also play an important role in the mother's feeding decision. Mothers who perceive their family member's preferred feeding practice as breastfeeding are most likely to initiate breastfeeding while mothers whose family members, specifically father and maternal grandmother, prefer formula only, combined feeding practices, or have no opinion are much more likely to never breastfeed (Odom et al. 2014).

2.6.2 Workplace support

In the United States, women of average childbearing age, 20-44 years, make up more than 50% of the workforce (USBC 2013), 55.3% of mothers with children 3 years and younger are employed, and 57% of mothers with an infant under one year old, take part in the labor force (BLS 2012). Employed women, especially those working full time, are less likely to initiate breastfeeding or have shorter breastfeeding durations when compared to women who are unemployed after delivery (USDHSS 2011). Multiple studies have shown significant correlation between workplace support and a mother's ability to maintain breastfeeding durations. Shepherd-Banigan & Bell (2014) reported 10 weeks being the average total maternity leave of currently working participants with only 17% of mothers able to take more than 12 weeks of maternity leave in the United States. Maternity leave of four weeks or less was taken by 12% of mothers, and a large portion of mothers, 43%, took five to eight weeks. This puts a lot of weight on workplace accommodations and support of breastfeeding mothers to achieve the recommended exclusivity and duration, especially when 43% of mothers need to return to work after only five to eight weeks of maternity leave. Guendelman et al. (2013) reported that women who were concerned about financial problems during pregnancy were more likely to return to work before 12 weeks of maternity leave. Shepherd-Banigan & Bell (2014) also reported that paid maternity leave was more commonly seen, and longer in duration, for women who were partnered, older, had a higher education, and had a higher income. Lack of maternity leave and breastfeeding support in the workplace contribute significantly to the low breastfeeding rates in the United States (Abdulloeva & Eyler 2013). Employers and workplaces that allow new mothers longer leave, specifically up to 12 weeks, and more flexible schedules will undoubtedly increase the overall duration and intensity of breastfeeding (Roe et al. 1999). California is one of only a couple states throughout the United States where state legislation is put in place to provide a Paid Family Leave (PFL) program for up to six weeks in a year giving families the opportunity to bond with their newborn, adopted, or foster child without the financial burden. California workers who used the PFL program, regardless of their job quality, displayed an increase in initiation and duration of breastfeeding. Employees of both high and low quality jobs that did not use paid family leave breastfed for an average of five weeks and had lower breastfeeding rates. The employees of high-quality jobs, who chose to use the PFL, breastfed for an average of 11 weeks and low

quality job employees with PFL breastfed on average nine weeks (Appelbaum & Milkman 2011). The PFL program in California is a great example of how employers providing paid maternity leave give mothers a fair opportunity to prolonging the duration of breastfeeding.

This has also been seen throughout countries with different standards for maternity and parental leave. Due to parental leave systems in Nordic European countries (Norway, Sweden, and Finland), parents are able to stay home and care for their children throughout the first year of life. Consequently, these countries allocate long paid maternity/paternal leave to new mothers and fathers. Finland, for example, offers its mothers 105 days/18 weeks of maternity leave and then an additional 158 working days of paid parental leave at 70% of their previous income. Norway provides families with 49 weeks of fully paid parental leave, 35 of which the mother is entitled to (ILO 2014). As seen in other studies, availability of maternity leave influences the duration of breastfeeding (Roe et al. 1999, Huang & Yang 2015). A 2009 European Nutrition and Health report examined data on all countries in the EU and illustrated that the Nordic countries have the highest rate of any breastfeeding at six months compared to any other country. Norway and Finland had twice the rate for breastfeeding at 12 months than any other country in the EU (Cattaneo 2009). These countries had the highest values for breastfeeding initiation, and any breastfeeding at six months and 12 months (Cattaneo 2009), also when compared to breastfeeding practices in the United States (CDC 2014a). The numbers reported for exclusive breastfeeding at six months are much higher in Minnesota and the United States. However, data collection definitions and methods were not consistent across all countries in the EU and differed from data collection methods seen in United States, which can impact inter-country comparison (Cattaneo 2009). Table 5 compares maternity leave and breastfeeding rates for Norway, Finland, the United States, and Minnesota.

Table 5. A comparison of maternal/parental leave and breastfeeding practices

	United States 2011 births	Minnesota 2011 births	Finland 2010 births	Norway 2007 births
Maternity Leave	12 weeks unpaid/job-protected leave with exceptions (FMLA)	12 weeks unpaid/job-protected leave with exceptions (FMLA)	18 weeks+ 158 working days (approx. 26 weeks) parental leave	49 weeks parental leave total (35 weeks maternity leave)
Breastfeeding initiation (%)	79.2	89.2	99	99
Any breastfeeding 6 months	49.4	59.2	66	82
Exclusive breastfeeding 6 months	18.8	23.5	9	13
Any breastfeeding 12 months	26.7	34.6	36	46

Source: Kristiansen et al. 2010, Uusitalo et al. 2012, CDC 2014a, ILO 2014

2.6.3 Health care service support

Variations in hospital routines are seen regardless of the patient populations and are known to cause disparities in breastfeeding rates (AAP 2012). The most common birthing practice in the United States is in a hospital setting. Health care practices and policies in maternity settings can either nurture or create barriers to supporting a mother's decision to breastfeed as well as her success in exclusivity and duration (ADA 2009, USDHHS 2011). For example, it has been reported that 24% of maternity services supply supplements of commercial infant formula to more than 50% of healthy, full-term breastfeeding infants, as a general practice in the first 48 hours after birth (ADA 2009, AAP 2013). In approximately 70% of the United States' facilities, mothers are sent home with discharge packs that contain infant formula, which undoubtedly suppresses the importance and value of exclusive breastfeeding (CDC 2008). A study by Ogbuanu et al. (2009), also found that a greater portion of mothers who did not initiate breastfeeding had received free formula. Furthermore, many mothers who have intended to exclusively breastfeed state that they have supplemented with formula earlier than anticipated because formula was given at the hospital (ADA 2009). Data from the IFPS II

demonstrates these points: 81.4% of mothers were sent home with formula bags while only 2% received breastfeeding supply bags. Mothers, who received formula at discharge from the birthing center, had reduced exclusive breastfeeding rates at both 10 weeks and at six months (Sadacharan et al. 2014). Services offered by the hospital can also play a big role in breastfeeding outcome. Attending a prenatal breastfeeding class has a positive impact on overall breastfeeding rates and an improved duration for time spent exclusively breastfeeding (Roe et al. 1999, ADA 2009). The impact of prenatal classes is undeniable; they increase the duration of breastfeeding by about five weeks (Roe et al. 1999). Additionally, in a Cochrane systematic review, health education interventions, such as prenatal education classes, were reported as an effective way to increasing breastfeeding rates, especially in low-income mothers (Dyson et al 2005). Research done by DiGiroloma et al. (2008) analyzed the association between the number of "Baby-Friendly" hospital practices mothers experience and likelihood of early breastfeeding termination. "Baby-Friendly" hospital practices are designed to influence and support breastfeeding outcome. In DiGiroloma et al.'s study, they found that the fewer "Baby-Friendly" hospital practices the mothers experienced, the greater the likelihood of breastfeeding cessation before 6 weeks postpartum.

Health care provider's support, as perceived by the mother, plays an important role in feeding practices. A study conducted by Lu et al. (2001), found that breastfeeding initiation was four times more likely when mothers were given encouragement from their health care physicians and nurses compared to mothers who were not encouraged. Based on data from the IFPS II in the United States, mother's who perceive their health care provider as having a preference for breastfeeding, are more likely to initiate breastfeeding while mother's who perceive their health care providers as not having an opinion on infant feeding practices or preferring formula are least likely to ever breastfeed (Odom et al. 2014).

In an American Dietetic Association (ADA) report (2009) on promoting and supporting breastfeeding, amidst their research they found young mothers claimed to not have received information on the health benefits of breastfeeding from their health care professionals. Mothers who do not initiate breastfeeding report being more likely to have not received a phone number for help, have not been taught how to breastfeed, and did not receive

information about breastfeeding as compared to mothers who initiate breastfeeding (Ogbuana et al. 2009). A Brazilian study similarly reported that cessation of exclusive breastfeeding at four months postpartum was more common in women who did not receive breastfeeding guidance during the postpartum period (Machado et al. 2014).

2.6.4 Community and social support

Mothers make decisions to breastfeed not only based on the beliefs and attitudes of family members, but also based on the community and its members' behaviors and attitudes. Community members and campaigns in support of breastfeeding can positively influence the decisions individuals and families make (USDHHS 2011, Vari et al. 2013). The community is made up of many components, and it is the degree to which the efforts put forward provide support for breastfeeding or impede on the process itself, which can ultimately be essential to breastfeeding success (USDHHS 2011). Community efforts and activities to promote breastfeeding can play an important role in a mother's breastfeeding experiences but equally important is how the mother perceives the people in the community's reactions or disapproval to her feeding choice (Hurst 2013).

2.6.5 Childcare providers

As previously mentioned, many nursing mothers go back to work within the first few months of the baby's life. This leaves many families to rely on daycare or childcare providers to care for their children during the workday. In the United States, close to half of infants are taken care of by someone other than their mother, such as family-run childcare homes or child care centers. This illustrates the importance of breastfeeding support by childcare facilities (CDC 2013b). The CDC refers to this care as Early Care and Education (ECE). They state that by ensuring their staff are well educated and trained on how to follow a mother's feeding protocol and handling breast milk, they are better able to play a significant role in being a supportive player in a mother's breastfeeding experience. The availability of ECE programs provides mothers and families with the support they need in order to initiate and continue breastfeeding (CDC 2013c). The efforts required of childcare providers to support a breastfeeding mother can be daunting and tedious. It demands proper education and knowledge of the correct and safe techniques for storing, handling and feeding breast milk

safely, but can make a world of difference in the successful process for breastfeeding mothers. In a study done by Li et al. (2005a), based on data from the 2002 NIS in the United States, the percentage of "ever breastfed" children was lower in children who were cared for by a childcare provider at six months old compared to children who did not attend a daycare at six months of age. The percentages were statistically significant at 68.5% to 73.4%, respectively. Kim & Gallien (2014) also reported similar findings regarding feeding practices and reported an association between family structure (single- versus two-parent households) and the use of childcare. Single mothers returned to work much sooner and were much more likely to need childcare compared to children of two parents. A Norwegian study, found that at both six and 12 months, breastfeeding rates were lower for children with childcare by someone other than the parents (Kristiansen et al. 2010). A recent study by Batan et al. explains the considerable role of childcare providers' support in sustaining breastfeeding practices. Childcare providers who were willing to feed pumped breast milk during childcare hours and allowed mothers to breastfeed on location before and after work were associated with continued breastfeeding at six months. Mothers whose childcare providers supported the following five support strategies were three times more likely to breastfeed than mothers who were supported with three or less of these strategies: feed breast milk, allow mothers to breastfeed at their site before and/or after work, allow mothers to come in and breastfeed during their lunch and other breaks, would thaw and prepare bottles of pumped milk if needed, and are willing to keep extra breast milk in a freezer for use if they ran out during the day (Batan et al. 2013).

2.7 Summary of literature

The World Health Organization and UNICEF highlight protection, promotion and support as high-priority actions for breastfeeding mothers. In the WHO/UNICEF report, Global Strategy for Infant and Young Child Feeding, the need for support through health care, the government, the community and community-based support groups, employers, childcare facilities, mass media, and educational authorities are all described in detail, as a necessary component to sustain appropriate breastfeeding practices (WHO/UNICEF 2003).

As stated by the U.S. Surgeon general, "Active involvement and support from family members, friends, communities, clinicians, healthcare systems, and employers can make

breastfeeding easier" (USDHHS 2011). Previous research conducted depicts and illustrates the commonly seen trends in breastfeeding practice disparities throughout the United States. However, despite these recurring trends, there is very limited research describing the different levels of social support available based on socio-demographic factors that contribute to these disparities in breastfeeding rates. To eliminate gaps in breastfeeding practices among different populations it is essential to understand the differences in the maternal support given to encourage and promote breastfeeding practices. Therefore, as literature has presented, there is an imperative need to recognize and better understand the association of a mother's support system and the disparities seen across subgroups of mothers and their success in breastfeeding practices. More clarity will help to address the maternal barriers and provide more effective support, promotion, and protection to eliminate the present disparities. In order to make progress, it is essential to understand who receives and does not receive the needed support to sustain successful breastfeeding practices. Public health strategies should promote breastfeeding support towards breastfeeding initiation and continuation among subgroups that are at a disadvantage to sustain continued breastfeeding.

2.8 Logical framework

Based on previous studies done, breastfeeding disparities exist between different groups in society and the level of support a mother receives can influence the success of her breastfeeding practices. In Figure 1, breastfeeding is at the center illustrating that each support circle plays a role in breastfeeding outcome but may be subject to different socio-demographic variables.

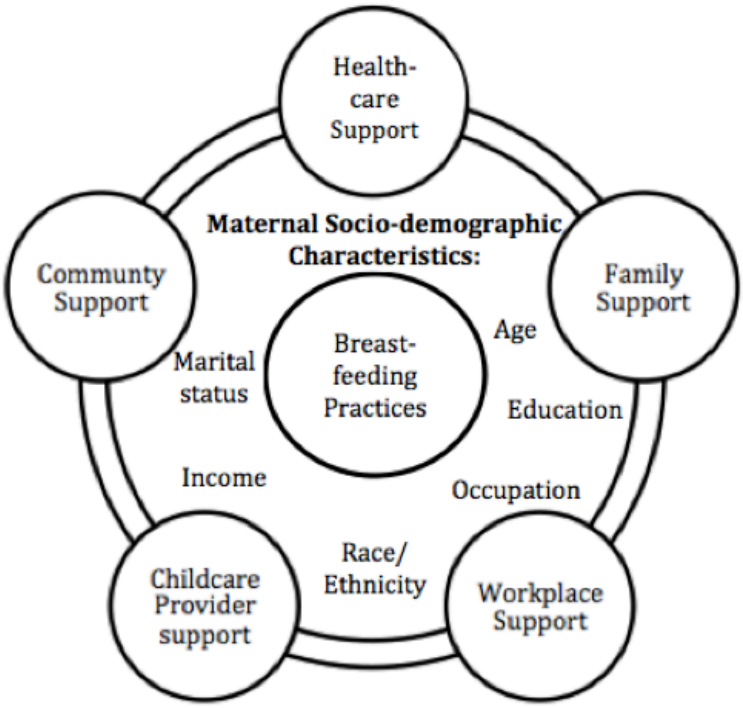


Figure 1. Support systems influencing breastfeeding practice

3. STUDY AIMS

The purpose of this study was to evaluate breastfeeding support in society towards mothers of different socio-demographic backgrounds in Minnesota. Specifically, to identify and describe which socio-demographic groups have not felt supported and from what areas of society.

The specific aims for the study were first, to describe breastfeeding practices across different socio-demographic groups; second, to describe the association between maternal socio-demographic characteristics and the allocated breastfeeding support received from family and friends, workplace, health care, childcare providers and within the community and other public settings and third, to outline reasons why some mothers choose to formula feed. This study aimed to highlight areas and vulnerable groups, which need to be addressed and targeted for future interventions, policy planning and development.

4. METHODOLOGY

4.1 Study design and setting

This is a cross-sectional descriptive study based on quantitative data. The study is designed to question mothers about their perceived levels of support across different sectors of society.

Data collection for this study lasted six weeks, from August 2014 to September 2014. The study was done in Minnesota on women who obtained post-natal care from Mercy Hospital or its supporting health care facilities, such as Allina Medical Clinic (AMC). Mercy Hospital's service lines encompass clinics, hospitals, and home care services, which are located in the northwestern Minneapolis-St. Paul metropolitan area in Minnesota. Mercy Hospital is a partner of Allina Health, which is a not-for-profit organization of clinics, hospitals and health care services located throughout Minnesota and western Wisconsin. Mercy Hospital treats patients throughout the midwest; most come from the north metro communities in Minnesota such as Andover, Anoka, Big Lake, Blaine, Brooklyn Park, Cedar, Champlin, Circle Pines, Columbia Heights, Coon Rapids, Elk River, Isanti, New Brighton, Osseo, Saint Francis and Zimmerman.

Patient demographics at Mercy Hospital closely mimic the demographics of Minnesota's overall population. Minnesota's demographic makeup is as follows: 86.5% white, 5.5% black or African American, 1.3% American Indian and Alaska Native, 4.4% Asian, and 4.9% Hispanic or Latino (USCB 2014). Mercy Hospital's patient race and ethnic demographic is 79.7% white, 7.4% black or African American, 5.6% Asian, 4.3% Hispanic, and 3% of mixed ethnic background. Mercy's hospital and health care services have an overall exclusive breastfeeding rate of 38.7%. In April 2014, 135 newborns were born at Mercy Hospital. Breastfeeding initiation rate was 75.6% and breastfeeding rate at discharge was 55.6%. The aforementioned statistics are based on communication with Mercy Hospital (see appendix number 1).

4.2 Participants

In this study, subjects were selected from patients, who used Allina Health Mercy Women's Health Clinic during August through September 2014. Cross-sectional data was collected

from 106 participants, 91 of which met the inclusion criteria of the study. The inclusion criteria required the participants to be Minnesota residents, literate and to have given birth to one or more children in the last three years. The birth time frame was chosen to ensure optimal maternal recall reliability and validity (Li et al. 2005b). Subjects are from a varying degree of socioeconomic and demographic factors, including marital status, age, education, occupation, race or ethnicity, and income level.

4.3 Data collection

Data collection method was via structured quantitative questionnaires. Questionnaires were piloted at Mercy Hospital and thereafter modified based on responses. The questionnaire could not be used on potential participants until it was cleared by the Institutional Review Board (IRB). After clearance by the IRB the questions could no longer be altered without resubmission to the IRB. Therefore, questionnaires were piloted on a small selection of 10 mothers employed by the hospital, all of which fit the inclusion criteria. Alterations were made to the questionnaire based on feedback from the piloting process.

4.3.1 Questionnaire structure

The questionnaire was comprised of multiple choice and Likert scale rating questions, which allowed for shorter time commitment from participants. The questionnaire included 56 questions. All mothers were asked to complete 26. Breastfeeding mothers were asked to fill in an additional 26 questions on breastfeeding support, and formula feeding mothers were asked to complete an additional four questions regarding their decision to formula feed. Independent variables included maternal age, ethnic background, marital status, education level, employment status, household income, and occupation. The dependent variables were mothers' feeding practices as well as breastfeeding mothers' perceived support and formula feeding mothers' reasons for choosing to formula feed.

The questionnaire was composed of four main sections and five sub-sections: (see appendix 2)

1. Mother's socio-demographic characteristics
2. Feeding practices
3. Breastfeeding support:

a. Family and Friends
b. Workplace
c. Healthcare Services
d. Community/Social
e. and Childcare Providers

4. Reasons to choose formula feeding

4.3.1.1 Mother's socio-demographic characteristics

This section was constructed using sample questionnaires from previous studies done in the United States and other developed countries. Household income was organized into five groups, which reflect the quintiles used for distribution of household income in research done by the Congressional Research Service in a report by Elwell (2014).

4.3.1.2 Feeding practices

This section on feeding practices was comprised of questions adapted from a 2006 Infant Feeding Study survey done in Leeds, Greenville & Lanark District Health Unit (Cunningham et al. 2009).

4.3.1.3 Breastfeeding support

In this section, breastfeeding mothers were questioned on breastfeeding support. They were given statements regarding how they perceived support from family and friends, workplace, health care, community and public settings, and their childcare providers. They were given the following scale to report their response: 1=strongly disagree, 2=disagree, 3=neither agree or disagree, 4=agree, 5=strongly agree. Questions pertaining to workplace and employment breastfeeding support were mainly derived from the United States Breastfeeding Committee's recommendations on workplace breastfeeding (USBC 2002b) and based on the current Minnesota Statutes-181.939 Nursing Mothers. A couple questions pertaining to childcare breastfeeding support were adapted from Section H-3: Child Care, of the CDC's IFPS II and health care support questions were adapted from the IFPS II Neonatal Questionnaire (CDC 2014c). Additionally, the section on childcare support used questions modeled after Batan et

al.'s (2013) questionnaire on childcare provider's breastfeeding support and a report by USBC (2002a).

4.3.1.4 Formula feeding mothers

Formula feeding mothers were given a list of reasons pertaining to what influenced their decision in choosing to formula feed their child. They were instructed to mark each reason as either: Very Important, Important, Somewhat Important, and Not Important. A selection of these questions, were also modeled after the questions used in the previous mentioned survey in section 1 (Cunningham et al. 2009) as well as the IFPS II (CDC 2014c). Additional questions were adapted from a study by Ogbuanu et al. (2009).

4.3.2 Logistics

Questionnaires were administered with the assistance of the Allina Health Mercy Women's Health Clinic's services manager and staff. Based on piloting, the questionnaire was estimated to take between 8 to 10 minutes to complete. English questionnaires were offered, in paper form, to incoming mothers before the start of their appointment and were collected before leaving the clinic. The study participants did not need assistance from staff during the filling in of the questionnaire.

4.4 Ethical considerations

Permission was requested from Mercy Hospital administration to collect patient data. The study, as determined by the IRB, was considered non-invasive and did not contain any subject identifiers and was therefore deemed ethical. Questionnaires were distributed on the basis of implied consent. An introductory paragraph, containing a description of the study and its' application, was read by the participating mothers before fulfillment of the questionnaire form. Participation was on a voluntary basis and participants were informed of the confidentiality of their participation. The questionnaire did not include names, and all participants remained anonymous and individual confidentiality was protected on all information collected.

4.5 Data analysis

All statistical analyses were completed using SPSS version 22 for Mac (IBM Corp., Armonk, NY). First, descriptive information on the participant's demographic characteristics were analyzed. Secondly, a cross-tabulation was completed for frequency and percentages of breastfeeding practices, and support across the different socio-demographic groups.

Categories for age, ethnicity, and marital status were modified to have two categories per variable. Age was combined to "less than 30 years old" and "30 years and older" but was previously listed as "younger than 18", "18-24", "25-29", "30-34" and "35 or older"; ethnicity was modified to "non-Hispanic white" and "others" which includes the following ethnicities: "American Indian" or "Alaska Native", "Asian or Asian American", "Black or African American", "Hispanic or Latino" and an "Other" option. Marital status categories were originally listed as "married", "divorced", "widowed", "separated", "a member of an unmarried couple", and "single" which were reclassified as "married" and "unmarried" for analysis. Education level was restructured to three main education levels, "high school graduate or GED", "1-2 years post-secondary school", and "higher education", however the original options were "high school graduate or GED", "Vocational or Trade School (1-2 years)", "Associate degree (junior college) (2 years)", "Bachelor's degree", "Master's degree", "Doctorate" and "none of the above (less than high school)." Employment status was modified to represent common work routines, "stay-at-home mothers" and "unemployed participants" were combined into one category "not working", "self-employed" and "employed part time" were combined into "employed part-time/self-employed" and "employed full-time" remained the same. Occupational categories were merged into "stay at home mother", "managers and professionals", and "technicians, associate service professionals, clerical workers, assemblers, and other elementary occupations." No responses were recorded for "Skilled agricultural, forestry and fishery workers", "Craft and related trades workers" and "Armed forces occupations."

The merged categories in section two of the questionnaire for feeding practices, were done for exclusive breastfeeding duration and any breastfeeding duration. The original categories were: "did not breastfeed", "less than 1 week", "1 week to less than 1 month", "1 month to less than

2 months", "2 months to less than 3 months", "3 months to less than 4 months", "4 months to less than 5 months", "5 months to less than 6 months", and "6 months or longer." The categories used for analysis were: "did not breastfeed", "less than 3 months", "3 months to less than 6 months" and "6 months or longer." In the section on breastfeeding support for breastfeeding mothers, the original Likert scale used was as follows: 1=strongly disagree, 2=disagree, 3=neither agree or disagree 4=agree, 5=strongly agree. During data analysis, based on number of respondents, categories 1 and 2 were combined into one category "disagree", categories 4 and 5 were combined into "agree", and category 3 was left as "neither agree or disagree."

5. RESULTS

The total number of subjects to fill in the questionnaire was 106. Ninety-one of those questionnaires fit the inclusion criteria of the study and were therefore used in the data analysis. Some participants choose not to respond to all given questions. A few original categories received zero responses and were therefore not used in the data analysis. All participants were 18 and older and had completed at least high school or a GED, and no full-time students participated in the study.

5.1 Breastfeeding practices of participants

Of the 91 participants, 59 mothers initiated breastfeeding at the first feeding, whereas 32 did not. For the purpose of this study, 72 were classified as breastfeeding mothers who continued any amount of breastfeeding after discharge from the hospital. The remaining 19 mothers were categorized as formula feeding mothers (Table 6).

Table 6. Breastfeeding and formula feeding frequency (n=91)

	n	%
Breastfed infant at first feeding	59	64.8
Did not breastfeed infant at first feeding	32	35.2
Breastfeeding mothers after discharge	72	79.1
Formula feeding mothers after discharge	19	20.9

5.2 Socio-demographic characteristics of participants

Socio-demographic characteristics of the study participants are presented in Table 7. Concerning age of participants, 68.9% were younger than 30 years old and the majority of mothers were of a non-Hispanic, white ethnicity (83.1%). Married mothers made up 67.8% of the study participants and the numbers of participants by education level were evenly distributed across all three educational categories. Full-time employed mothers made up almost half of the study participants while one quarter of participants were stay-at-home mothers. About half, 49.5%, of participants were technicians, associate service professionals,

clerical workers, workers and other elementary occupations. Household income was split into five groups and 37.1% of mothers fell between $64,556-$104,100 while the other four groups were evenly distributed.

Table 7. Characteristics of the participants

Characteristics	N	%
Age	n=90	
Younger than 30 years old	62	68.9
30 years or older	28	31.1
Ethnic background	n=89	
Non-Hispanic white	74	83.1
Other origin	15	16.9
Marital status	n=90	
Married	61	67.8
Non-married	29	32.2
Education level	n=90	
High school graduate or GED	28	31.1
1-2 years post-secondary education	33	36.7
Higher education	29	32.2
Employment status	n=90	
Employed full-time	44	48.9
Employed part-time/self-employed	23	25.6
Not working	23	25.6
Occupation	n=91	
Stay-at-home mother	23	25.3
Managers and professionals	23	25.3
Technicians, associate service professionals, clerical workers, assemblers and other elementary occupations	45	49.5
Household income	n=89	
$20,590 or less	12	13.5
$20,591-$39,800	15	16.9
$39,801-$64,555	15	16.9
$64,556-$104,100	33	37.1
$104,101 or more	14	15.7

5.3 Breastfeeding practices and duration by socio-demographic characteristics

The frequency of breastfeeding versus formula feeding mothers across different socio-demographic characteristics is illustrated in Table 8. Marital status and education level indicated statistically significant differences within their subgroups; 38% of unmarried

mothers formula fed compared to only 13% of married mothers (p= 0.007). All mothers in the highest income level group breastfed their infant after leaving the hospital. Only 0-15% of mothers within the two highest household income groups choose to formula feed compared to 33% of mothers in the lower three groups (p= 0.086).

Table 8. Frequency of breastfeeding and formula feeding by socio-demographic characteristics

Characteristics	Breastfeeding n	Breastfeeding %	Formula Feeding n	Formula Feeding %	p-value (2-sided) [a]
Age	90				0.960
Younger than 30 years old	49	79.0	13	21.0	
30 years or older	22	78.6	6	21.4	
Ethnic background	89				0.406
Non-Hispanic white	57	77.0	17	23.0	
Other origin	13	86.7	2	13.3	
Marital status	90				0.007
Married	53	86.9	8	13.1	
Non-married	18	62.1	11	37.9	
Education level	90				0.001
High school graduate or GED	16	57.1	12	42.9	
1-2 years post-secondary education	27	81.8	6	18.2	
Higher education	28	96.6	1	3.4	
Employment status	90				
Employed full-time	34	77.3	10	22.7	0.876
Employed part-time/self-employed	19	82.6	4	17.4	
Not working	18	78.3	19	21.7	
Occupation	91				0.178
Stay-at-home mother	20	87.0	3	13.0	
Managers and professionals	20	87.0	3	13.0	
Technicians, associate service professionals, clerical workers, assemblers and other elementary occupations	32	71.1	13	28.9	
Household income	89				0.086
$20,590 or less	8	66.7	4	33.3	
$20,591-$39,800	10	66.7	5	33.3	
$39,801-$64,555	10	66.7	5	33.3	
$64,556-$104,100	28	84.8	5	15.2	
$104,101 or more	14	100.0	0	0.0	

[a]Pearson Chi-square test

Exclusive breastfeeding duration was significantly different by marital status (p= 0.018), education level (p= 0.013), and occupational categories (p= 0.013) (Table 9). Compared to only 3.8% of unmarried mothers, 19.6% of married mothers exclusively breastfed for three to six months. Out of the women still breastfeeding at six months or longer, 21.4% were married mothers while only 11.5% of unmarried mothers. Age was not associated with breastfeeding duration as would have been expected (p= 0.493).

Table 9. Exclusive breastfeeding duration by socio-demographic characteristics

Characteristics	Exclusive Breastfeeding Duration: Did not breastfeed n	%	Less than 3 months n	%	3 months to less than 6 months n	%	6 months or longer n	%	p-value [a]
Age									0.493
Younger than 30 years old	13	22.8	28	49.1	6	10.5	10	17.5	
30 years or older	6	25.0	8	33.3	5	20.8	5	20.8	
Ethnic background									0.539
Non-Hispanic white	17	25.4	29	43.3	10	14.9	11	16.4	
Other origin	2	14.3	7	50.0	1	7.1	4	28.6	
Marital status									0.018
Married	8	14.3	25	44.6	11	19.6	12	21.4	
Non-married	11	42.3	11	42.3	1	3.8	3	11.5	
Education level									0.013
High school graduate or GED	12	44.4	11	40.7	2	7.4	3	11.1	
1-2 years post-secondary education	6	21.4	13	46.4	3	10.7	8	28.6	
Higher education	1	3.7	12	44.4	7	25.9	7	57.7	
Employment status									0.578
Employed full-time	10	25.6	18	46.2	5	12.8	6	15.4	
Employed part-time/self-employed	4	17.4	9	39.1	6	26.1	4	17.4	
Unemployed/stay at home mom	5	25.0	9	45.0	1	5.0	5	25.0	
Occupation									0.013
Stay-at-home mother	3	15.0	9	45.0	2	10.0	6	30.0	
Managers and professionals	3	13.6	7	31.8	8	36.4	4	18.2	
Technicians, associate service professionals, clerical workers, assemblers and other elementary occupations	13	32.5	20	50.0	2	5.0	5	12.5	
Household income									0.115
$20,590 or less	4	36.4	7	63.6	0	0.0	0	0.0	
$20,591-$39,800	5	33.3	8	53.3	0	0.0	2	13.3	
$39,801-$64,555	5	35.7	4	28.6	2	14.3	3	21.4	
$64,556-$104,100	5	17.2	10	34.5	7	24.1	7	24.1	
$104,101 or more	0	0.0	7	53.8	3	23.1	3	23.1	

[a]Pearson Chi-square test

Differences in duration of any breastfeeding were significant for mothers of different marital statuses (p= 0.007), education levels (p= 0.002), occupations (p= 0.021), and household incomes (p= 0.037) (Table 10). At six months or longer, 41.8% of married mothers still breastfed while 11.5% of unmarried mothers breastfed the same duration. A similar trend was observed for education level, 57.7% of mothers of higher education still breastfed at six months or longer while 11.1% of mothers with a high school diploma or GED breastfed the same duration. Any breastfeeding also differed significantly by occupation, as 52.4% of mothers holding a position as a manager or professional breastfed for six months or longer while only 12.5% of technicians, associate service, professionals, clerical workers, workers and other elementary occupations breastfed that long. Mothers from the highest household income also breastfed the longest out of all other mothers and the trend was consistent, as household income increase so did the percentage of mothers who were still breastfeeding at six months or longer.

Table 10. Duration of any breastfeeding/breast milk by socio-demographic characteristics

	Any Breastfeeding Duration								
	Did not Breastfeed		Less than 3 months		3 months to less than 6 months		6 months or longer		p-value [a]
Characteristics	n	%	n	%	n	%	n	%	
Age									0.495
Younger than 30 years old	13	23.2	21	37.5	6	10.7	16	28.6	
30 years or older	6	25.0	5	20.8	3	12.5	10	41.7	
Ethnic background									0.680
Non-Hispanic white	17	25.4	21	31.8	8	12.1	20	30.3	
Other origin	2	14.3	5	35.7	1	7.1	6	42.9	
Marital status									0.007
Married	8	14.5	16	29.1	8	14.5	23	41.8	
Non-married	11	42.3	10	38.5	2	7.7	3	11.5	
Education level									0.002
High school graduate or GED	12	44.4	10	37.0	2	7.4	3	11.1	
1-2 years post-secondary education	6	21.4	10	35.7	4	14.3	8	28.6	
Higher education	1	3.8	6	23.1	4	15.4	15	57.7	
Employment status									0.700
Employed full-time	10	25.6	14	35.9	6	15.4	9	23.1	
Employed part-time/self-employed	4	18.2	6	27.3	3	13.6	9	40.9	
Unemployed/stay at home mom	5	25.0	6	30.0	1	5.0	8	40.0	
Occupation									0.021
Stay-at-home mother	3	15.0	6	30.0	1	5.0	10	50.0	
Managers and professionals	3	14.3	5	23.8	2	9.5	11	52.4	
Technicians, associate service professionals, clerical workers, assemblers and other elementary occupations	13	32.5	15	37.5	7	17.5	5	12.5	
Household income									0.037
$20,590 or less	4	36.4	5	45.5	1	9.1	1	9.1	
$20,591-$39,800	5	33.3	8	53.3	0	0.0	2	13.3	
$39,801-$64,555	5	35.7	4	28.6	0	0.0	5	35.7	
$64,556-$104,100	5	17.2	6	20.7	6	20.7	12	41.4	
$104,101 or more	0	0.0	3	25.0	3	25.0	6	50.0	

[a]Pearson Chi-square test

5.4 Maternal perceived support

Tables 11-16 describe the current situation pertaining to perceived maternal breastfeeding support from family and friends, health care, workplace, and childcare.

5.4.1 Maternal breastfeeding support by family and friends

Overall, perceived breastfeeding support from family members and friends was positive. However, paternal support was not viewed similarly by marital status (Table 11). Married mothers were more likely to receive breastfeeding support from their child's father, compared to the support received by unmarried mothers ($p= 0.009$).

Table 11. Maternal family and friend breastfeeding support by socio-demographic characteristics

	Paternal Support			Female Family Support			Friend Support		
	Disagree	+/-	Agree	Disagree	+/-	Agree	Disagree	+/-	Agree
Age									
Younger than 30 years	2	3	41	2	5	38	1	6	39
30 years or older	1	2	18	1	3	17	0	2	19
p-value [a]			0.905			0.931			0.719
Ethnic background									
Non-Hispanic white	3	4	47	2	7	45	1	7	46
Other origin	0	1	11	1	1	9	0	1	11
p-value [a]			0.704			0.709			0.801
Marital status									
Married	0	4	47	1	6	44	0	7	44
Non-married	3	1	13	2	2	12	1	1	15
p-value [a]			0.009			0.201			0.159
Education level									
High school graduate or GED	2	1	14	2	2	13	1	1	15
1-2 years post-secondary education	1	2	23	1	5	20	0	5	21
Higher education	0	2	23	0	1	23	0	2	23
p-value [a]			0.496			0.188			0.265
Employment status									
Employed full-time	3	3	26	1	6	24	1	6	25
Employed part-time/self-employed	0	1	18	1	2	16	0	1	18
Not working	0	1	16	1	0	16	0	1	16
p-value [a]			0.399			0.397			0.385
Occupation									
Stay-at-home mother	0	1	18	1	0	18	0	1	18
Managers and professionals	0	2	16	0	2	15	0	1	17
Technicians, associate service professionals, clerical workers, assemblers and other elementary occupations	3	2	26	2	6	23	1	6	24
p-value [a]			0.375			0.248			0.336
Household income									
$20,590 or less	2	1	5	2	0	6	0	0	8
$20,591-$39,800	0	0	9	0	2	7	0	1	8
$39,801-$64,555	0	0	10	0	1	9	0	2	8
$64,556-$104,100	1	3	24	1	4	22	1	5	22
$104,101 or more	0	1	11	0	1	11	0	0	12
p-value [a]			0.151			0.193			0.666

[a]Pearson Chi-square tests, GED-General Educational Development, +/- neither agree or disagree

5.4.2 Maternal breastfeeding support by workplace

Two variables of workplace support demonstrated a non-significant trend toward less perceived support for high school graduate or GED mothers when compared to mother with more education. Only 38.5% of high school educated mothers agreed their employer supports and accommodates breastfeeding in the workplace, whereas in the 1-2 years post-secondary education group, 63.2% agreed, and in the highest education level 75% agreed (p= 0.084). When asked about the perceived support and encouragement of their co-workers, a similar trend was apparent, 38.5%, 65%, and 75% of the participants in each category agreed, respectively (p= 0.057)(Table 12). Paid versus unpaid employer-provided maternity leave was associated with maternal age (p=0.041) and marital status (p=<0.001) when 19 stay-at-home mothers were excluded as shown in Table 13. Furthermore, household income (p=0.060) and occupation (p=0.095) deemed a tendency towards association where 63.6% of women employed in managerial and professional occupations received paid maternity leave while 41.5% of women working as technicians, associate service professionals, clerical workers, assemblers, and other elementary occupations received it. Although not significant, only 33% of mothers with a high school education or GED received employer provided paid maternity leave compared to 66.7% of mothers with a higher education. Overall, only 52.1% of mothers had employer provided paid maternity leave.

Table 12. Workplace maternal breastfeeding support by socio-demographic characteristics

	Employer supports and accommodates breastfeeding in workplace			At workplace, breastfeeding accommodations are in a private area, sanitary, and provide enough comfort to allow for expression of breast milk			Co-workers support and encourage breastfeeding		
	Disagree	+/-	Agree	Disagree	+/-	Agree	Disagree	+/-	Agree
Age									
Younger than 30 years	11	6	22	13	5	22	9	7	24
30 years or older	2	2	9	1	3	9	2	3	8
p-value [a]			0.634			0.187			0.817
Ethnic background									
Non-Hispanic white	12	6	24	13	7	23	10	8	25
Other origin	1	2	6	1	1	7	1	2	6
p-value [a]			0.522			0.387			0.719
Marital status									
Married	8	4	25	8	5	25	6	7	25
Non-married	4	4	7	5	3	7	4	3	8
p-value [a]			0.270			0.439			0.620
Education level									
High school graduate or GED	6	2	5	5	2	6	6	2	5
1-2 years post-secondary education	5	2	12	6	3	11	3	4	13
Higher education	1	4	15	2	3	15	1	4	15
p-value [a]			0.084			0.375			0.057
Employment status									
Employed full-time	6	8	16	7	7	16	6	7	17
Employed part-time/self-employed	5	0	12	5	1	12	3	3	12
Not working	1	0	4	1	0	4	1	0	4

Table 12. Workplace maternal breastfeeding support by socio-demographic characteristics

p-value [a]			0.129			0.405			0.766
Occupation									
Stay-at-home mother	1	0	6	1	0	6	1	0	6
Managers and professionals	3	4	10	5	3	9	3	2	12
Technicians, associate service professionals, clerical workers, assemblers and other elementary occupations	9	4	26	8	5	17	7	8	15
p-value [a]			0.420			0.622			0.324
Household income									
$20,590 or less	3	0	4	3	0	4	2	1	4
$20,591-$39,800	2	1	2	3	0	2	1	2	2
$39,801-$64,555	2	2	2	2	3	2	3	2	2
$64,556-$104,100	4	4	15	2	4	16	3	3	17
$104,101 or more	1	1	8	2	1	7	1	2	7
p-value [a]			0.487			0.136			0.477

[a]Pearson Chi-square test, GED-General Educational Development, +/- neither agree or disagree

Table 13. Working mother's employer provided maternity leave by socio-demographic characteristics

	Paid maternity leave	Unpaid maternity leave
Age		
Younger than 30 years	23	29
30 years or older	13	5
p-value [a]		0.041
Ethnic background		
Non-Hispanic white	33	27
Other origin	3	6
p-value [a]		0.225
Marital status		
Married	32	15
Non-married	5	18
p-value [a]		<0.001
Education level		
High school graduate or GED	7	13
1-2 years post-secondary education	14	12
Higher Education	16	8
p-value [a]		0.110
Employment status		
Employed full-time	23	19
Employed part-time/self-employed	8	12
Not working	6	2
p-value [a]		0.227
Occupation		
Stay-at-home mothers		
Managers and professionals	14	8
Technicians, associate service professionals, clerical workers, workers and other elementary occupations	17	24
p-value [a]		0.095
Household income		
$20,590 or less	2	6
$20,591-$39,800	4	7
$39,801-$64,555	4	6
$64,556-$104,100	18	11
$104,101 or more	9	2
p-value [a]		0.060

[a]Pearson Chi-square test, GED-General Educational Development

5.4.3 Maternal breastfeeding support by health care

Among health care support, the observed associations for married and unmarried mothers, as shown in table 15, were 72% of married mothers reportedly agreed that they had received sufficient information from health care, while only 43% of unmarried mothers reported they had (p= 0.015). Similarly, within the highest group of household income, all but one mother agreed that they had received sufficient information. Across the remaining four groups for household income, 75% of those in the lowest, 33% in the second group, 80% in the third group, and 56% of mothers in the fourth group, agreed they had received sufficient information (p= 0.012) (Table 14). After analysis for all participants in the study, there was a tendency among higher education mothers to report that prenatal classes were offered and available at their health care center compared to mothers of 1-2 post secondary education or high school or GED, 89.7%, 72.7%, and 57.1% respectively (p=0.077) (Table 15).

It is also important to look at the overall number of mothers who either disagreed or had no opinion. In the same question regarding whether the mother received sufficient information about breastfeeding support groups, 34.3% of mothers did not actually agree that they had, which included 19.4% those who disagreed and 14.9% did not agree nor disagree.

Table 14. Health care maternal breastfeeding support by socio-demographic characteristics

	Health care taught adequate skills to successfully breastfeed			Before leaving the birthing center the mother received sufficient information about breastfeeding support groups/services			Mother feels she could contact health care provider for breastfeeding guidance and help			Overall health care providers have been supportive of breastfeeding practices		
	Disagree	+/-	Agree	Disagree	+/-	Agree	Disagree	+/-	Agree	Disagree	+/-	Agree
Age												
Younger than 30 years	6	4	36	9	8	28	7	4	34	4	6	35
30 years or older	5	2	14	4	2	15	2	4	14	1	1	18
p-value [a]			0.525			0.658			0.416			0.492
Ethnic background												
Non-Hispanic white	10	5	39	12	7	35	8	5	41	5	5	43
Other origin	1	1	10	1	3	8	1	3	7	0	2	9
p-value [a]			0.676			0.386			0.245			0.433
Marital status												
Married	8	3	39	10	4	36	6	6	37	3	4	41
Non-married	3	3	11	3	6	7	3	2	11	2	3	12
p-value [a]			0.326			0.015			0.801			0.397
Education level												
High school graduate or GED	4	2	11	3	4	10	2	2	13	1	1	15
1-2 years post-secondary education	4	2	19	6	2	16	5	2	17	3	3	18
Higher education	3	2	20	4	4	17	2	4	18	1	3	20
p-value [a]			0.853			0.693			0.707			0.750
Employment status												
Employed full-time	5	4	22	7	6	17	6	4	20	4	5	21
Employed part-time/self-employed	4	2	13	4	3	12	1	3	15	0	2	17
Not working	2	0	15	2	1	14	2	1	13	1	0	15
p-value [a]			0.531			0.507			0.568			0.173
Occupation												
Stay at home mother	3	0	16	2	2	15	2	1	15	1	0	17
Managers and professionals	3	2	13	4	2	12	2	4	12	1	4	13
Technicians, associate service professionals, clerical workers,	5	4	22	7	6	17	5	3	22	3	3	24

Table 14. Health care maternal breastfeeding support by socio-demographic characteristics

assemblers and other elementary occupations												
p-value [a]			0.614			0.574			0.561			0.267
Household income												
$20,590 or less	2	0	6	2	0	6	1	0	7	0	1	7
$20,591-$39,800	1	3	5	1	5	3	1	1	7	0	2	6
$39,801-$64,555	1	1	8	1	1	8	1	1	8	2	0	8
$64,556-$104,100	6	2	19	8	4	15	6	5	16	3	4	20
$104,101 or more	1	0	11	1	0	11	0	1	10	0	0	11
p-value [a]			0.231			0.012			0.589			0.322

[a]Pearson Chi-square test, GED-General Educational Development, +/- neither agree or disagree

Table 15. Health care facility offered and had available prenatal classes based on socio-demographics

Prenatal classes offered by health care facility	Yes (%)	No (%)	Do not know (%)
Age			
Younger than 30 years	44 (71.0)	3 (4.8)	15 (24.2)
30 years or older	22 (78.6)	3 (10.7)	3 (10.7)
p-value [a]			0.234
Ethnic background			
Non-Hispanic white	55 (74.3)	5 (6.8)	14 (18.9)
Other origin	11 (73.3)	1 (6.7)	3 (20.0)
p-value [a]			0.995
Marital status			
Married	47 (77.0)	5 (8.2)	9 (14.8)
Non-married	19 (65.5)	1 (3.4)	9 (31.0)
p-value [a]			0.163
Education level			
High school graduate or GED	16 (57.1)	3 (10.7)	9 (32.1)
1-2 years post-secondary education	24 (72.7)	3 (9.1)	6 (18.2)
Higher Education	26 (89.7)	0 (0)	3(10.3)
p-value [a]			0.077
Employment status			
Employed full-time	32(72.7)	3(6.8)	9(20.5)
Employed part-time/self-employed	18(78.3)	1(4.3)	4(17.4)
Not working	16(69.6)	2(8.7)	5(21.7)
p-value [a]			0.966
Occupation			
Stay-at-home mothers	17(73.9)	2(8.7)	4(17.4)
Managers and professionals	21(91.3)	0(0)	2(8.7)
Technicians, associate service professionals, clerical workers, workers and other elementary occupations	29(64.4)	4(8.9)	12(26.7)
p-value [a]			0.192
Household income			
$20,590 or less	8(66.7)	1(8.3)	3(25.0)
$20,591-$39,800	10(66.7)	1(6.7)	4(26.7)
$39,801-$64,555	10(66.7)	3(20.0)	2(13.3)
$64,556-$104,100	25(75.8)	1(3.0)	7(21.2)
$104,101 or more	13(92.9)	0(0)	1(7.1)
p-value [a]			0.376

[a]Pearson Chi-square test GED-General Educational Development

5.4.4 Maternal breastfeeding support by childcare provider

Childcare provider support exemplified an overall positive response by a majority of the participants. A statistically significant difference between ethnic groups was shown when asked their opinion of whether their childcare provider would keep extra breast milk in the freezer for use if needed (p=0.001), which exemplifies a possible association. Non-Hispanic white mothers were less likely to report being supported compared to mothers from other ethnicities. Ethnicity also showed trends towards a non-significant difference in two other support categories: breastfeeding onsite before and after work (p=0.071) and the childcare provider is willing to thaw and prepare bottles of expressed breast milk (p=0.078). Unfortunately, the difference in the number of participants in the two ethnic categories makes it challenging to compare or to state a true association and results should therefore be interpreted with caution (Table 16).

A statistically significant difference was also observed between type of childcare provider, family daycare versus childcare center, and the willingness to keep extra breast milk in the freezer for use if needed. Family daycares showed a much higher likelihood of supporting mothers this way (p=0.001), however, it is not shown in a table.

Table 16. Childcare provider support of maternal breastfeeding practices by socio-demographic

	CCP is willing to feed expressed breast milk			CCP would allow mother to breastfeed onsite before and after work			CCP would allow mother to come in and breastfeed during lunch and other breaks			CCP is willing to thaw and prepare bottles of expressed breast milk			CCP will keep extra breast milk in freezer fo use if needed		
	Disagree	+/-	Agree	Disagree	+/-	Agree	Disagree	+/-	Agree	Disagree	+/-	Agree	Disagree	+/-	Agree
Age															
Younger than 30 years	2	3	29	4	4	25	3	6	23	3	3	27	6	5	22
30 years or older	0	0	11	0	0	9	0	0	9	0	1	8	0	1	8
p-value [a]			0.403			0.260			0.198			0.641			0.332
Ethnic background															
Non-Hispanic white	2	2	32	4	1	28	3	3	26	3	1	29	6	1	26
Other origin	0	0	8	0	2	6	0	2	6	0	2	6	0	4	4
p-value [a]			0.613			0.071			0.362			0.078			0.001
Marital status															
Married	1	2	28	2	2	24	1	4	22	1	3	24	4	3	21
Non-married	1	1	12	2	2	10	2	2	10	2	1	11	2	3	9
p-value [a]			0.834			0.539			0.465			0.431			0.638
Education level															
High school graduate or GED	1	0	11	1	2	9	1	2	9	1	1	10	1	2	9
1-2 years post-secondary education	1	2	14	3	2	12	2	3	12	2	2	13	2	2	13
Higher Education	0	1	15	0	0	13	0	1	11	0	1	12	3	2	8
p-value [a]			0.592			0.261			0.692			0.766			0.832
Employment status															
Employed full-time	2	3	23	4	4	18	3	5	17	3	4	19	5	6	15
Employed part-time/self-employed	0	0	13	0	0	12	0	1	11	0	0	12	1	0	11
Not working	0	0	4	0	0	4	0	0	4	0	0	4	0	0	4
p-value [a]			0.491			0.193			0.382			0.270			0.145
Occupation															
Stay-at-home mother	0	0	4	0	0	4	0	0	4	0	0	4	0	0	4
Managers and professionals	0	0	16	1	0	13	1	1	11	1	0	13	3	1	10
Technicians, associate	2	3	21	3	4	18	2	5	18	2	4	19	3	5	17

Table 16. Childcare provider support of maternal breastfeeding practices by socio-demographic

service professionals, clerical workers, assemblers and other elementary occupations															
p-value [a]			0.365			0.382			0.683			0.457			0.500
Household income															
$20,590 or less	0	0	6	0	0	6	0	0	6	0	0	6	0	0	6
$20,591-$39,800	0	0	5	1	1	3	1	1	3	1	0	4	1	1	3
$39,801-$64,555	0	0	5	0	0	5	0	0	5	0	0	5	0	0	5
$64,556-$104,100	2	2	16	3	2	13	2	3	12	2	2	14	2	3	13
$104,101 or more	0	0	8	0	0	7	0	1	6	0	1	6	3	1	3
p-value [a]			0.727			0.521			0.670			0.739			0.289

[a]Pearson Chi-square test CCP-Child Care Provider, GED-General Educational Development, +/- neither agree or disagree

5.4.5 Maternal breastfeeding support by the community and in public

A total of 55.7% of breastfeeding mothers had felt too uncomfortable, at some point in time, to breastfeed in a public place. The most common place where mothers felt uncomfortable was a restaurant, reported by 43.3%, and the second was at a mall, reported by 40% of breastfeeding mothers.

5.5 Formula feeding mothers

Among those who chose not to breastfeed, the five most common reasons that influenced their feeding choice were: personal feeding preference, formula feeding is easier, mother planned to return to work, mother believed that formula feeding is as good as breastfeeding or that formula is better, and mother wanted the infant's father to help with feeding (Table 17).

Table 17. Formula feeding mother's influential reasons for choosing to formula feed

	Very Important	Important	Somewhat Important	Not Important
	%	%	%	%
Personal feeding preference	66.7	16.7	-	16.7
Formula feeding is easier	44.4	27.8	5.6	22.2
Mother planned to return to work	44.4	22.2	-	33.3
Formula feeding is as good as breastfeeding or that formula is better	47.1	17.6	17.6	17.6
Mother wanted the infant's father to help with feeding	27.8	11.1	27.8	33.3

6. DISCUSSION

A cross-sectional study design was used to describe breastfeeding practices and perceived maternal breastfeeding support throughout five sectors of society with regards to maternal socio-demographic characteristics. The five sectors considered for this study were family and friends, workplace, health care, childcare providers, and community and public settings, as those have been deemed important by previous research and health organizations (WHO/UNICEF 2003, CDC 2006, ADA 2009, USDHHS 2011).

No similar studies have been identified for the state of Minnesota, which deems this the first of its kind to explore breastfeeding support differences between maternal socio-demographic groups. At an international and national level, literature demonstrates the disparities in breastfeeding practices across socio-demographic characteristics, as well as, the importance of strong support systems to encourage breastfeeding, but unfortunately there is very limited research on associations between maternal support systems and breastfeeding disparities seen across different socio-demographic groups. This study has served as a successful pilot study for future research on this topic.

As mentioned previously, maternal characteristics in this study were comparable to the reported demographics at Mercy Hospital. The service area includes a patient race and ethnic demographic of 79.7% white, 7.4% black or African American, 5.6% Asian, 4.3% Hispanic, and 3% of mixed ethnic background. In this study, participant demographics were non-Hispanic white 83.1%, black or African American 2.2%, Hispanic or Latino 3.4%, Asian 2.2%, American Indian or Alaska Native 1.1%, mixed and/or other ethnic background 8%. The breastfeeding initiation rate reported for Mercy Hospital and its health care services is 75.6% and 55.6% at discharge (see appendix 1), whereas in this study, only 64.8% of the participants initiated breastfeeding at the first feeding and 79.1% were breastfeeding at discharge. The women who were willing to participate in our study may have had a more positive view on breastfeeding and therefore illustrated a higher breastfeeding rate at discharge compared to Mercy Hospital's overall cliental.

6.1 Feeding practices by socio-demographic characteristics

Consistent with earlier finding from the United States, the major findings include a significant difference between mothers of different marital statuses and different education levels, and their decision to breastfeed or formula feed (Ogbuana 2009, Thulier & Mercer 2009, Jones et al. 2011). Marital status and educational level were also associated with exclusive breastfeeding duration. More married mothers reported they had breastfed between three to six months or six months or longer, when compared to unmarried mothers, as also found by Li et al. (2005). Mothers with higher education levels followed the same pattern (Li et al. 2005, Jones et al. 2011). Exclusive breastfeeding duration was also influenced by the mother's occupation (Kimbro 2006). A greater number of stay-at-home mothers exclusively breastfeed at six months or longer compared to mothers in the other two occupational categories. Managers and professionals reported breastfeeding exclusively for longer periods of time compared to mothers working as technicians, associate service professionals, clerical workers, and other elementary occupations. This could indicate a more flexible and accommodating work environment for manager and professional occupations as well as better employee benefits such as paid and longer maternity leave (Applebaum & Milkman 2011).

In regard to duration of any breastfeeding, mothers with professional or managerial jobs did not differ much from stay-at-home mothers, and actually conveyed a higher percentage of mothers that breastfeed for six months or longer. Similar results have been reported in a study by Kimbro (2006). In this study, contrasting to previous studies (Ryan et al. 2006), no association was found for employment status, which may also point to work environment playing a more significant role in the mother's ability to sustain breastfeeding as opposed to full-time or part-time employment. In our study mothers from different marital statuses, education levels, household incomes, and previously mentioned occupations, illustrated significant differences in any breastfeeding duration (CDC 2013a). Maternal age has previously been seen as an influential variable correlated to breastfeeding initiation (Roe et al. 1999, Lu et al. 2001, Jones et al. 2011, CDC 2013a) and exclusive breastfeeding duration (Thulier & Mercer 2009). However, in contrast to previous work, this study did not illustrate a significant association between any breastfeeding practices and maternal age. A lack of

association was similarly found for ethnicity; however, the comparable number of study participants between categories was insufficient.

6.2 Support by socio-demographic characteristics

The major findings in this study concerning perceived support, are reported across the following social support systems: family support, health care support, workplace support, and childcare support in addition to community and public settings. Furthermore, six different socio-demographic characteristics were associated with support outcome: age, marital status, household income, education level, occupation, and ethnicity.

6.2.1 Age

The only support variable to show a significant association for age was employer-provided maternity leave. In our study, mothers who were younger than 30 were less likely to receive paid maternity leave from their workplace, as similarly reported by Shepherd-Banigan & Bell (2014). The overall lack of association for age as a breastfeeding and support outcome determinant compared to what was expected could have been influenced by the homogeneity of the study participants' ages.

6.2.2 Ethnicity

Childcare provider support exemplified an overall positive response by a majority of the participants. It did, however, differ based on maternal ethnicity. Nonetheless, it is difficult to determine an actual association due to low participant numbers, but the results of this study indicate a possible association between ethnicity and childcare providers' support. The results point to better support towards mothers from different ethnic backgrounds compared to non-Hispanic white mothers. Very limited studies have been done on childcare provider breastfeeding support, and no previous studies have been found on childcare provider support and ethnic background. However, Besore (2014) studied barriers to breastfeeding in a Hispanic population and found that many women could not afford proper childcare and relied on family or friends to help out. Many of which were not very supportive of breastfeeding. It is possible the mothers in this study from different ethnic backgrounds perceived higher support from family daycares and childcare centers because they compare the level of support

to the lower support they experienced with family members or friends as the main childcare providers.

6.2.3 Marital status

Non-married women received less support across three different support areas: family support, health care support, and workplace support. The data suggests married mothers reported more support from their child's father than unmarried mothers, which agrees with previous literature that paternal support leads to more positive breastfeeding practices (WHO/UNICEF 2003, Wolfberg et al. 2004, Odom et al. 2014). Marital status was associated with type of employer provided maternity leave; married mothers were more likely to have paid maternity leave compared to their counterparts (Shepherd-Banigan & Bell 2014). Married mothers were also more likely to receive sufficient information about breastfeeding support groups and services before leaving the hospital's birthing center. Ogbuana et al. (2009) reported that mothers who did not initiate breastfeeding reported they did not receive important information from their health care providers, such as a phone number for help and information about breastfeeding. This simply clarifies the importance of sufficient information and support from health care services for sufficient breastfeeding practices.

6.2.4 Education level

The data points to an inconsistency in offered and available prenatal classes to mothers of different education levels. Less educated mothers either reported that prenatal classes weren't offered or available, or they did not know whether they were or not, more often than mothers with higher education levels. Mothers with higher education levels may be more confident in their own knowledge and understanding of the system and therefore may be more proactive when seeking information and asking questions about the availability of services when compared to lower educated mothers. It is important to note, health education interventions, such as prenatal education classes, are found to be effective in increasing breastfeeding rates, especially in low-income mothers (Dyson et al 2005). Although, the study did not show an association between offered prenatal classes and income level, it did for education and occupation, which are two variables known to play an appreciable role in income status. Across all education levels, a non-significant association emerged for workplace support.

Higher educated mothers were more likely to agree that their employer supports and accommodates breastfeeding in the workplace, and to agree their co-workers support and encourage breastfeeding as compared to mothers of 1-2 post-secondary education and high school or GED.

6.2.5 Occupation

Mothers from different occupations did not differ in perceived support across any other studied support categories as would have been expected for workplace accommodations and employer support, besides employer-granted maternity leave (Appelbaum & Milkman 2011) and availability of prenatal classes. Mothers who were not in a managerial or professional position had higher tendency of being confronted with unpaid maternity leave and reported less knowledge of available or offered prenatal classes from their health care centers. The financial burden of unpaid maternity leave could result in the mother returning to work sooner than desired (Guendelman et al. 2013), therefore influencing duration and exclusiveness of breastfeeding (Abdulloeva & Eyler 2013).

6.2.6 Household income

A much higher portion of mothers from the higher income categories agreed they had received sufficient information about breastfeeding support groups and services. A Brazilian study reported that cessation of exclusive breastfeeding at four months postpartum was more common in women who did not receive breastfeeding guidance during the postpartum period (Machado et al. 2014). Dyson et al. (2005) found one-on-one education sessions were effective in increasing breastfeeding rates in women with low incomes.

In the study, mothers were not asked to report whether or not the Mercy Hospital's birth center provided face-to-face information on breastfeeding support services, however, resources are available on their website online (Allina Health 2015). It is possible that mothers are informed of the many services and groups that are offered and how to access the information online, which may add to the observed disparities due to unequal access to these services for lower income mothers who may not have the resources needed to access the internet.

6.3 Formula feeding

Personal feeding preference was the most commonly reported reason why mothers chose to formula feed. A majority of the mothers, 83.4%, listed it as either a very important or important influential reasons for choosing to formula feed. The perception of the breast as sexual and formula feeding as the social norm (Dowling 2005) may contribute to why formula feeding would be a mother's preferred feeding practice.

6.4 Limitations and strengths of the study

There are several important limitations to this study. This study collected cross-sectional data, which does not allow for causal interpretation. The data for the present study was drawn from one health care location, which had very limited representation of statewide health care practices as well as some of the socio-demographic groups. Ethnically, as previously illustrated, the study sample was an accurate representation of Minnesota's population demographics and Mercy's client demographics, however it did not allow for a representative sample of the perceived support within this subgroup. The number of women who refused to participate and whether or not every woman who entered the clinic was offered the questionnaire and given the option to participate is unknown. Mothers who had an infant of less than 6 months of age and were still breastfeeding did not have a clear option when questioned about exclusive and any breastfeeding durations. The fact that mothers were given more options than just "agree" or "disagree" regarding perceived support, made it difficult to identify the mother's primary opinion on perceived support. External generalizability may be limited due to only using one clinic location for this study population. Nonetheless, currently, a second clinic location in Duluth, Minnesota, is collecting additional questionnaires to utilize in this study. This will add numbers to the study's sample size as well as geographical variability, which will expectantly give the study stronger representativeness for Minnesota women of all socio-demographic characteristics. Once all data is combined and analyzed the objective will be to write an article based on the final study results.

An advantage of the current study is its uniqueness, as it is the first known study in Minnesota to describe the association of socio-demographic characteristics and support. Furthermore, the

data collection process was very consistent; questionnaires were distributed in the same location by the same support staff daily. Data was also collected in a very efficient setting where mothers needed to be present for their appointments and were not required to put in extra time to complete the study as questionnaires were completed while they waited to be called in by their physician. The setting also allowed us to survey women belonging to the general public. The questionnaire was designed using previous questionnaire structures, which are considered to be valid and accurate. The adapted questions were taken from surveys, questionnaires, and information used by the USBC, the CDC's IFPS II, the Congressional Research Service and previous studies done by Batan et al. (2013) and Cunningham et al. (2009) All of which are highly accredited and well respected organizations, and studies which have been successful and published.

6.5 Implications of study

Although not always different by socio-demographic background, the results of the study illustrate that across many support settings numerous mothers did not agree they had received support. This does not mean they always claimed not to have received support. Many mothers also had no opinion. The fact that 55.7% of breastfeeding mothers had felt too uncomfortable to breastfeed in public highlights the need for more public health campaigns to help educate the public on breastfeeding as a natural part of development and as a social norm. To narrow down the overall socio-demographic differences in breastfeeding practices, susceptible groups should be a focus and priority for prenatal and postnatal breastfeeding advocating at maternity clinics and within labor and delivery departments of hospitals. Marital status is significantly linked to a mother's decision to breastfeed, as well as her capability of sustaining both exclusive breastfeeding and any breastfeeding. It is important for health care facilities and professionals to recognize that unmarried mothers report less support from the child's father in addition to having not received sufficient information about breastfeeding support groups and services from their birth center or hospital, when compared to married mothers. It is also more likely they will need to return to work sooner than married mothers due to unpaid maternity leave. This should be highlighted in hospital strategies to help support unmarried mothers who do not have the extra support at home, need to return to work sooner, and who may not have received information needed to receive extra support throughout the community, to increase

overall breastfeeding practices. Support services should be proactively offered to all mothers to help encourage and support breastfeeding practices. Although no clear association was found between socio-demographics and childcare support early return to work usually requires childcare. Childcare providers should be required to take educational courses on allowing expressed breast milk in a bottle and safe breast milk storage, and should provide storage space for expressed milk.

Additionally, mothers who were younger than 30, had a lower household income and were not in a managerial or professional position were also more commonly faced with unpaid maternity leave. This highlights the need for change at the state level, such as a statewide maternity leave program as seen in the PFL program in California. This could help to balance the unequal distribution of employer-provided maternity leave in turn helping to increase breastfeeding duration (Applebaum & Milkman 2011). A total of 47.9% of mothers in this study were not offered any amount of employer-granted paid maternity leave and may be forced to go back to work earlier than desired. Therefore, it may be beneficial for hospitals and other health organizations to organize and provide mothers with free pre- and postnatal support groups and classes to help teach skills and safety guidelines for breast milk expression and storage in order to encourage mothers to continue breastfeeding after returning to work. Hospitals located in areas that service more diverse and minority populations, such as unmarried, lower income, and less-educated population, should make it a priority to actively offer pre- and postnatal breastfeeding courses and support groups in order to help educate and support women in their feeding practices.

Based on the results, more research is needed to explore the possible differences in barriers breastfeeding mothers from different socio-demographic backgrounds face. The small number of participants in each socio-demographic group made it hard to develop a precise conclusion. However, a study with a more proportionate study sample would be beneficial to the result interpretation and a well-defined and more precise conclusion. Although most women in this study, regardless of their socio-demographic background, reported similar perceived support across all five examined sectors in society, it does not diminish the important role these support groups play in helping mothers efficiently breastfeed their children. The fact that

disparities in breastfeeding across these different groups exist, highlights the need to better understand the differences in breastfeeding perceptions between these socio-demographic groups and what information, advice and support these mothers feel would help increase breastfeeding initiation and duration. Differences in barriers to breastfeeding initiation, reasons for not initiating breastfeeding and support received by mothers, across different socio-demographic backgrounds are seldom studied. More research is needed in this field to better understand these differences. Although no simple solution or strategy exists to increase support for breastfeeding mothers, actions need to be taken to ensure that all women who choose to breastfeed are able to benefit from the support that is available to them. Additional studies need to be done to shed light on what type of support mothers find most helpful and how to effectively and equally target mothers from all backgrounds.

7. CONCLUSION

This study provides preliminary data on breastfeeding practices in Minnesota and how comparably mothers of different socio-demographic backgrounds perceive allocated breastfeeding support from family and friends, workplace, health care, childcare providers and within the community and other public settings. Despite the fact that the majority of women breastfed after hospital discharge a high proportion did not continue exclusive breastfeeding for the recommended duration of six months. Mothers, who were married, had a higher level of education and who were from higher household incomes were more likely to breastfeed. Duration of both, any and exclusive breastfeeding, was longer for married mothers, mothers with a higher level of education, and mothers who were working in a managerial or professional occupation. Additionally, any breastfeeding was also more commonly seen in mothers from higher household incomes.

The data not only illustrates disparities in breastfeeding practices between mothers of different backgrounds but also indicates that more vulnerable groups do exist in regards to a lack of support, and not all women received comparable support throughout their social environments. The differences in support varied based on the following maternal characteristics: age, marital status, ethnicity, education level, occupation, and household income level. Our data exposed unmarried mothers as the most vulnerable group concerning support. These mothers reported less support from their child's father; they were less likely to benefit from employer granted paid maternity leave and not as likely to have received sufficient information about breastfeeding support groups and services before leaving the birthing center. A support area highlighted in this study, which illustrated an unequal level of support for different mothers, was employer-provided paid maternity leave. Nearly half of the mothers in our study were faced with unpaid maternity leave and the characteristics of those mothers were most commonly: younger than 30, unmarried, lower household income, and did not come from a managerial or professional occupation. Our results also support tendencies for less support based on socio-demographics in a few other areas such as workplace support, health care and childcare, which should be prioritized in further research. These aspects include employer support and accommodations for breastfeeding in workplace, co-workers

support and encourage of breastfeeding for mothers, whether the health care facility offered and had available prenatal classes, and whether or not the childcare provider allows the mother to breastfeed onsite before and after work and is willing to thaw and prepare bottles of expressed breast milk.

Reasons for choosing to formula feed included personal feeding preference, formula feeding is easier, mother planned to return to work, formula feeding is as good as breastfeeding or that formula is better, and mother wanted the infant's father to help with feeding. Extra breastfeeding support, education and an overall improvement in breastfeeding culture may affect these feeding choices.

This study emphasizes the need for a better understanding behind these inequalities in breastfeeding support and practices. The goal for the American society should be for every woman, not just a portion of the population, to be confident in her support systems and perceive the social environments she lives within as a support system to rely on.

8. REFERENCES

Abdulloeva S, Eyler A. Policies on Worksite Lactation Support Within the States and Organizations. Journal of Women's Health. 2013;22:769-773.

Agostoni C, Braegger C, Decsi T, Kolacek S, Koletzko B, Michaelson K, Mihatsch W, Moreno L, Puntis J, Shamir R, Szajweska H, Turck D, Van Goudoever J. Breast-feeding: A Commentary by the ESPGHAN Committee on Nutrition. Journal of Pediatric Gastroenterology and Nutrition. 2009;48:112-125

Allina Health. Mercy Hospital:Services. Allina Health System, 2015. http://www.allinahealth.org/Mercy-Hospital/Services/Women-and-childrens-services/Birth-Center/Services/

American Academy of Pediatrics (AAP). Breastfeeding and the Use of Human Milk. Pediatrics. 2012;129:827-841

American Dietetic Association (ADA): Promoting and Supporting Breastfeeding. Journal of the American Dietetic Association. 2009;109:1926-1942.

Appelbaum E, Milkman R. Employer and Worker Experiences with Paid Family Leave in California. Leaves That Pay. 2011:1-32

Ballard O, Morrow A. Human Milk Consumption: Nutrients and Bioactive Factors. Pediatr Clin North Am. 2013;60:49-74

Barasi,M. 2003. Human Nutrition: A Health Perspective Second Edition. Hodder Arnold.

Batan M, Li R, Scanlon K. Association of Child Care Providers Breastfeeding Support with Breastfeeding Duration at 6 Months. Maternal & Child Health Journal, 2013;17:708-713.

Besore C. Barriers to Breastfeeding for Hispanic Mothers. Breastfeeding Medicine. 2014; 9:352-354

Brenner M, Buescher S. Breastfeeding: A Clinical Imperative. Journal of Women's Health. 2011;20:1767-1773.

Bureau of Labor Statistics (BLS). U.S. Department of Labor. The Economics Daily:Happy Mother's Day from BLS: working mothers in 2012. 2013. http://www.bls.gov/opub/ted/2013/ted_20130510.htm (accessed 24.4.2015)

Butte N, Lopez-Alarcon M, Garza C. Nutrient Adequacy of Exclusive Breastfeeding for the Term Infant During the First Six Months of Life. Geneva, Switzerland. World Health Organization. 2002.

Cattaneo A. Breastfeeding. In book: Elmadfa I, (ed). European Nutrition and Health Report 2009. Vienna: Karger, 2009; 196-201.

Center for Disease Control and Prevention (CDC). Racial And Socioeconomic Disparities In Breastfeeding -- United States, 2004. MMWR: Morbidity & Mortality Weekly Report. 2006;55:335-339.

Center from Disease Control and Prevention (CDC), Breastfeeding Report Card-United States, Center for Chronic Disease Prevention and Health Promotion. 2014a.

Center for Disease Control and Prevention (CDC). National Survey of Maternity Practices in Infant Nutrition and Care (mPINC) – 2013. 2014b. (accessed 15.10.2014) http://www.cdc.gov/breastfeeding/data/mpinc/data/2013/tables6_1b-6_4b.htm

Center for Disease Control and Prevention (CDC). Infant Feeding Practices Study II and Its Year Six Follow Up. 2014c (accessed 12.6.2014) http://www.cdc.gov/breastfeeding/data/ifps/questionnaires.htm

Center for Disease Control and Prevention (CDC). Breastfeeding-Related Maternity Practices At Hospitals and Birth Centers- United States. Morbid Mortal Weekly Report. 2008;57: 621-625.

Center for Disease Control and Prevention (CDC). National Immunization Survey: Breastfeeding Among U.S. Children Born 2000-2013. 2013a (accessed 5.3.2014). http://www.cdc.gov/breastfeeding/data/nis_data/index.htm

Center from Disease Control and Prevention (CDC), Breastfeeding Report Card-United States. Center for Chronic Disease Prevention and Health Promotion. 2013b.

Centers for Disease Control and Prevention (CDC). Strategies to Prevent Obesity and Other Chronic Diseases: The CDC Guide to Strategies to Support Breastfeeding Mothers and Babies. Atlanta: U.S. Department of Health and Human Services. 2013c. (accessed 10.5.2014) http://www.cdc.gov/breastfeeding/pdf/BF-Guide-508.PDF

Cunningham J, Jackson K, Oickle D. 2006 Infant feeding survey: Factors Influencing Breastfeeding Initiation, Duration And The Introduction Of Solids. Leeds, Grenville & Lanark District Health Unit. 2009.

Dewey K, Lutter C, Martines J, Daelmans B. Guiding principles for complementary feeding of the breastfed child. WHO: Food and Nutrition. Pan American Health Organization World Health Organization. 2003 (accessed 2.4.2014) http://whqlibdoc.who.int/paho/2003/a85622.pdf?ua=1&ua=1

DiGirolamo A, Grummer-Strawn L, Fein S. Effect of Maternity-Care Practices on Breastfeeding. Pediatrics. 2008;122:S43-S49.

Dowling D. Lessons From the Past: A Brief History of the Influence of Social, Economic, and Scientific Factors on Infant Feeding. Newborn and Infant Nursing Reviews. 2005;5:2-9

Dvorak B. Milk Epidermal Growth Factor and Gut Protection. Journal of Pediatrics. 2010;156:S31-35.

Dyson L, McCormick FM, Renfrew MJ. Interventions for promoting the initiation of breastfeeding (Review). Cochrane Database of Systematic Reviews. 2005; 2 (updated 2007)

Elwell C. The Distribution of Household Income and the Middle Class. Congressional Research Service. 2014. (accessed 6.3.2014) http://fas.org/sgp/crs/misc/RS20811.pdf

EU 2008. European Commission. Directorate Public Health and Risk Assessment EU Project on Protection, promotion and support of breastfeeding in Europe: a blueprint for action. 2008 http://ec.europa.eu/health/ph_projects/2002/promotion/fp_promotion_2002_frep_18_en.pdf (accessed 27.5.2015)

Greer FR. Do Breastfed Infants Need Supplemental Vitamins? Pediatric clinics of North America. 2001;48:415–423.

Guendelman S, Goodman J, Kharrazi M, Lahiff M. Work-Family Balance After Childbirth: The The Association Between Employer-Offered Leave Characteristics and Maternity Leave Duration. Journal of Maternal and Child Health. 2014;18:200-208

Huang R, Yang M. Paid maternity leave and breastfeeding practice before and after California's implementation of the nation's first paid family leave program. Economics and Human Biology. 2015; 16: 45-59

Huffman S, Harika R, Eilander A, Osendarp S. Essential fats: how do they affect growth and development of infants and young children in developing countries? A literature review. Maternal and Child Nutrition. 2011;7:44-65

Hurst C. An Initial Validation Of A Measure Of Sexual Perceptions Regarding Breastfeeding. Social Work in Public Health. 2013;28:21-31

International Labour Organization. Maternity and paternity at work: Law and practice across the world. 2014. Geneva http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_242615.pdf (accessed 21.5.2015)

Jones JR, Kogan MD, Singh GK, Dee DL, Grummer-Strawn LM. Factors Associated With Exclusive Breastfeeding In The United States. Journal of the American Academy of Pediatrics. 2011;128:1117-1125.

Kim J, Gallien T. Childcare Arrangements And Infant Feeding Practices By Family Structure And Household Income Among US Children Aged 0 To 2 Years. Maternal and Child Nutrition. 2014;1-12

Kimbro R. On-the-Job Moms: Work and Breastfeeding Initiation and Duration for a Sample of Low-Income Women. Maternal and Child Health. 2006;10:19-26

Kogan MD, Singh GK, Dee DL, Belanoff C, Grummer-Strawn L. Multivariate Analysis of State Variation in Breastfeeding Rates in the United States. American Journal of Public Health. 2008; 98:1872-1880.

Kristiansen AL, Lande B, Overby NC, Andersen LF. Factors associated with exclusive breast-feeding and breast- feeding in Norway. Public Health Nutrition. 2010;12:2087-2096

Lawrence RA, Lawrence RM. Breastfeeding: A Guide for the Medical Profession 7th ed. Missouri, USA. Elsevier Mosby. 2011

Li R, Darling N, Maurice E, Barker L, Grummer-Strawn L. Breastfeeding Rates in the United States by Characteristics of the Child, Mother, or Family: The 2002 National Immunization Survey. Journal of the American Academy of Pediatrics, 2005a; 115:31-37.

Li R, Scanlon KS, Serdula MK, The Validity and Reliability of Maternal Recall of Breastfeeding Practice. Nutrition reviews. 2005b;63:103-110.

Lu M, Lange L, Slusser W, Hamilton J, Halfon, N. Provider Encouragement of Breastfeeding Evidence From a National Survey. Obstetrics & Gynecology. 2001;97:290-295.

Machado M, Assis K, Oliveira F, Ribeiro A, Araujo R, Cury A, Priore S, Franceschini S. Determinants of the Exclusive Breastfeeding Abandonment: Psychosocial Factors. Rev Saude Publica. 2014; 48:985-994

McVeagh P, Miller JB. Human Milk Oligosaccharides: Only the Breast (Review Artilce). Journal of Paediatrics and Child Health. 1997;33:281-286

National Conference of State Legislation: Breastfeeding State Laws. 2014. http://www.ncsl.org/research/health/breastfeeding-state-laws.aspx. (Accessed 15.10.2014)

Nordic Nutrition Recommendations (NNR) 2012: Integrating Nutrition And Physical Activity. 2014. 5th Edition. Copenhagen, Denmark: Nordic Council of Ministers. (Accessed 26.2.2015) http://dx.doi.org/10.6027/Nord2014-002

Odom E, Li R, Scanlon K, Perrine C, Grummer-Strawn L. Association of Family and Health Care Provider Opinion on Infant Feeding with Mother's Breastfeeding Decision. Academy of Nutrition and Dietetics. 2014;114:1203-1207

Office of Disease Prevention and Health Promotion (DPHP). Healthy People: Maternal Infant and Child Health- Infant Care. 2014. (Accessed 21.5.2015) http://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives

Office of the Revisor of Statutes-2014 Minnesota Statutes: 181.939 Nursing Mothers. https://www.revisor.leg.state.mn.us/statutes/?id=181.939 (accessed 20.9.2015)

Ogbuanu C, Probst J, Laditka S, Liu J, Baek J, Glover S. Reasons Why Women Do Not Initiate Breastfeeding. Women's Health. 2009;268-278

Renfrew M, McCormick FM, Wade A, Quinn B, Dowswell T. Support for healthy breastfeeding mothers with healthy term babies. Cochrane Database of Systematic Reviews. 2012;6

Roe B, Whittington L, Fein SB, Teisl, M. Is There Competition Between Breast-feeding and Maternal Employment. Demography. 1999; 36:157-171

Ryan AS, Zhou W, Arensberg MB. The Effect Of Employment Status On Breastfeeding In The United States. Women's Health Issues. 2006; 16:243-251

Sadacharan R, Grossman X, Matlak S, Merewood A. Hospital Discharge Bags and Breastfeeding at 6 Months: Data from the Infant Feeding Practice Study II. Journal of Human Lactation 2014; 30:73-79

Shepherd-Banigan M, Bell F. Paid Leave Benefits Among a National Sample of Working Mothers with Infants in the United States. Maternal and Child Health Journal. 2014; 18: 286-295.

Smith-Gagen J, Hollen R, Tashiro S, Cook D, Yang W. The Association of State Law to Breastfeeding Practices in the US. Journal of Maternal and Child Health. 2014;18:2034-2043.

Thulier D, Mercer J. Variables Associated With Breastfeeding Duration. Journal of Obstetric, Gynecologic, & Neonatal Nursing. 2009;38: 259-268.

UNICEF. The Baby Friendly Initiative-Health Benefits of Breastfeeding. 2010. (accessed 10.5.2014) http://www.unicef.org.uk/BabyFriendly/About-Baby-Friendly/Breastfeeding-in-the-UK/Health-benefits/

United States Breastfeeding Committee (USBC) 2002a, Breastfeeding and Child Care, United States Breastfeeding Committee. Raleigh, NC.

United States Breastfeeding Committee (USBC) 2002b, Workplace Breastfeeding Support, United States Breastfeeding Committee. Raleigh, NC.

United States Breastfeeding Committee (USBC) 2010. Workplace Accommodations to Support and Protect Breastfeeding. United States Breastfeeding Committee. Washington, DC

United States Breastfeeding Committee (USBC). Employment. 2013. (accessed 10.5.2014) http://www.usbreastfeeding.org/p/cm/ld/fid=11

United States Census Bureau (USCB). State & County Quick Facts. 2014. (accessed 6.3.2014) www.quickfacts.census.gov/qfd/states/27/27003.html

Uusitalo L, Nyberg H, Pelkonen M, Sarlio-Lähteenkorva S, Hakulinen-Viitanen T, Virtanen S. Imeväisikäisten ruokinta Suomessa vuonna 2010. Terveyden ja Hyvinvoinnin Laitos. Juvenes Print. 2012. Helsinki. https://www.thl.fi/documents/10531/95751/Raportti%202012%208.pdf (accessed 21.5.2015)

U.S. Department of Health and Human Services (USDHHS) 2011, The Surgeon General's Call to Action to Support Breastfeeding. U.S. Department of Health and Human Services, Office of the Surgeon General, Washington, D.C.

U.S. Department of Labor (USDL). 2013 Fact Sheet #73 Break Time for Nursing Mothers under the FLSA. U.S Department of Labor, Wage and Hour Division

Var P, Vogeltanz-Holm N, Olsen G, Anderson C, Holm J, Peterson H, Henly S. Community Based Attitudes and Beliefs. Health Care for Women International, 2013;34:529-606.

Walker A. Milk as the Gold Standard for Protective Nutrients. Journal of Pediatrics. 2010;156:s3-7

Wang B. Sialic Acid Is an Essential Nutrient for Brain Development and Cognition. Annual Review of Nutrition. 2009; 29:177-222

Wolfberg A, Michels K, Shields W, O'Campo P, Bronner Y, Bienstock J. "Dads as breastfeeding advocates: Results from a randomized controlled trial of an educational intervention", American Journal of Obstetrics and Gynecology. 2004; 191: 708-712.

World Health Organization (WHO) & UNICEF. Global Strategy for Infant and Young Child Feeding, World Health Organization, Geneva. 2003

Zhang Z, Adelman A, Rai D, Boettcher J, Lönnerdal B. Amino Acid Profiles in Term and Preterm Human Milk through Lactation: A Systematic Review. Nutrients. 2013;5:4800-4821

Ziegler E, Nelson S, & Jeter M. Iron Stores Of Breastfed Infants During The First Year Of Life. Nutrients. 2014;6: 2023-2034

Zimmerman, DR, Guttman, N. Breast Is Best: Knowledge Among Low-Income Mothers Is Not Enough. J Hum Lact. 2001; 17:14–19

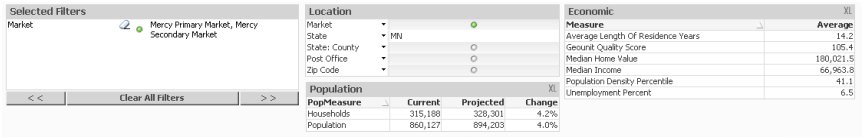
9. APPENDIX

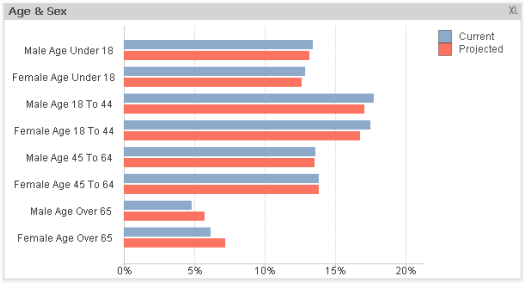
Appendix 1. Mercy Hospital Demographics

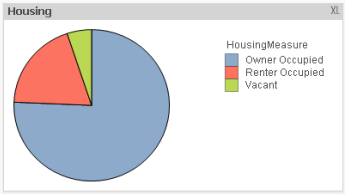
From: "Olson, MariBeth" <MariBeth.Olson@allina.com>
Subject: FW: Demographics
Date: May 30, 2014 at 8:59:44 PM GMT+3
To: "Tawni Mattila (tawnimattila@hotmail.com)" <tawnimattila@hotmail.com>

Tawni, here is some demographics of our market, please let me know if there is any other demographic info you will need. I will also be forwarding you some other information related to the questions you asked. Thanks!
A few points about the data:

- The data in the dashboard is provided by Truven. According to the dashboard: "current year" means 2013; "project year" means 2018.
- I've selected both Mercy's primary market and Mercy's secondary market to be included in the data below. The primary market refers to the top 75% discharging zip codes, and secondary makes up the next 15% so top 90% of discharging zip codes.





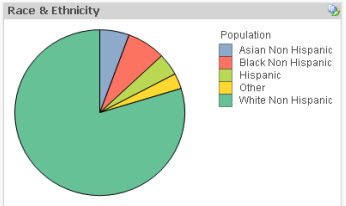


Housing

Housing Units	Total	% of Total
Vacant	16,975	5.1%
Renter Occupied	63,834	19.2%
Owner Occupied	251,354	75.7%
Total	**332,163**	

Age & Sex

SexAgeMeasure	Current	Current % of Total	Projected	Projected % of Total	Change
Male Age Under 18	115,242	13.4%	117,560	13.1%	2.0%
Female Age Under 18	110,820	12.9%	113,078	12.6%	2.0%
Male Age 18 To 44	152,609	17.7%	152,864	17.1%	0.2%
Female Age 18 To 44	150,767	17.5%	150,030	16.8%	-0.5%
Male Age 45 To 64	116,894	13.6%	121,133	13.5%	3.6%
Female Age 45 To 64	119,290	13.9%	123,785	13.8%	3.8%
Male Age Over 65	41,463	4.8%	51,171	5.7%	23.4%
Female Age Over 65	53,042	6.2%	64,582	7.2%	21.8%
Total	**860,127**		**894,203**		**4.0%**



Race & Ethnicity

Population	Total	% of Total
Asian Non Hispanic	48,119	5.6%
Black Non Hispanic	63,291	7.4%
Hispanic	37,154	4.3%
Other	25,824	3.0%
White Non Hispanic	685,739	79.7%
Total	**860,127**	

Appendix 2. Questionnaire

Breastfeeding Support Across Different Socio-demographic Groups of Society-A study from Minnesota

Dear respondent,

At the University of Eastern Finland (Faculty of Health Sciences, Institute of Public Health and Clinical Nutrition) and Mercy Hospital of Allina Health, we are doing research about your perception and experiences of infant feeding support. We want to know about your social, economic and cultural conditions, and about the support you have received regarding your infant feeding practices. Our questionnaire will take approximately 10 minutes and we ask that you complete the questionnaire only once. We appreciate your participation.

Your participation is voluntary; you can deny filling in this questionnaire at any moment. Your name and identification information will not be recorded on the questionnaire and your responses will be anonymous. Your answers are important to us. The study results will be reported as a master thesis and published in a scientific journal. If you would like to acquire additional information concerning the study, please contact researcher Tawni Jaakola (e-mail tawni.jaakola@outlook.com)

Instructions for filling in the questionnaire: If you agree to participate in our study, please give truthful answers and complete each question to the best of your ability. Regarding multiple-choice questions, please circle the answer that suits you best. Some questions may provide an option to choose more than one answer, please follow the individual instructions given with each of those questions. By proceeding to fill out the questionnaire below you are consenting to take part in this study. Thank you for your participation.

SECTION 1: SOCIO-DEMOGRAPHIC CHARACTERISTICS:

1. What age were you when your last child was born?
   a. Younger than 18
   b. 18-24
   c. 25-29
   d. 30-34
   e. 35 or older

2. What is your ethnic background? **(Please circle all that apply)**
   a. American Indian or Alaska Native
   b. Asian or Asian American
   c. Black or African American
   d. Hispanic or Latino
   e. Non-Hispanic White
   f. Other, please specify: _____
3. Are you:
   a. Married

b. Divorced
c. Widowed
d. Separated
e. A member of an unmarried couple
f. Single

4. Who are the adults living in your household? **(Please circle all that apply)**
   a. Infant's Father
   b. Infant's Stepmother
   c. Infant's Stepfather
   d. Infant's maternal grandmother
   e. Infant's paternal grandmother
   f. Other, please specify: _____

5. What is the highest degree or level of school you have completed?
   a. High school graduate or GED
   b. Vocational or Trade School (1-2 years)
   c. Associate degree (junior college) (2 years)
   d. Bachelor's degree
   e. Master's degree
   f. Doctorate
   g. None of the above (less than high school)

6. Are you currently:
   a. Employed full time
   b. Employed part time
   c. Self-employed
   d. Unemployed
   e. A student
   f. A stay at home mother

7. Which best describes your total yearly household income:
   a. $20,590 or less
   b. $20,591-$39,800
   c. $39,801-$64,555
   d. $64,556-$104,100
   e. $104,101 or more

8. Which of the following best describes your employment?

a. Stay at home mother
b. Managers— (e.g. chief executive, administrative, professional service manager, hospitality manager)
c. Professionals— (e.g. engineer, health professional, teacher, lawyer)
d. Technicians and associate professionals— (e.g. pharmaceutical technician, hygienist, information technician, fitness professional, culinary associate)
e. Clerical support workers—(e.g. customer service, numerical and material recording clerks, secretaries, office clerk)
f. Service and sales workers—(e.g. cook, waitress, bartender, housekeeping, hairdresser, cashier, childcare worker)
g. Skilled agricultural, forestry and fishery workers—(e.g. market gardener, crop grower, animal producer)
h. Craft and related trades workers— (e.g. painter, carpenter, blacksmith, structural metal workers)
i. Factory and machine operators, and assemblers—(e.g. semi-truck driver, bus driver, other factory operators: mining, metal, paper)
j. Elementary occupations—(e.g. cleaners, helpers, laborers, food preparation assistant)
k. Armed forces occupations—(e.g. position in any branch of the military)

9. Please specify your occupation: _____

10. My workplace employs:
    a. Less than 50 employees
    b. 50 employees or more
    c. N/A (Not Applicable)

SECTION 2: FEEDING PRACTICES:

Please note: If you have more than one child, please answer all questions in reference to your children/child born within the last 3 years.

11. When did you decide your infant feeding plan?
    a. During pregnancy
    b. After pregnancy

12. What did you plan to feed your infant?
    a. Breast milk only
    b. Formula feeding only
    c. Combination

13. During your pregnancy, where did you receive information on infant feeding practices? **(Please circle all that apply)**

a. Partner
b. Friends
c. Infant's maternal grandmother
d. Infant's paternal grandmother
e. Other relative
f. Employer
g. Co-workers
h. Childcare provider
i. Community group
j. Media/Internet
k. Doctor
l. Nurse
m. Lactation consultant
n. Midwife
o. Breastfeeding or prenatal class
p. Other, please specify: _____
q. No one/no where

14. When did a health care professional ask you about your infant feeding plans?
    a. During pregnancy
    b. After birth of your infant
    c. Both during pregnancy and after birth of your infant
    d. Never

15. During your pregnancy, did a health care professional inform you of the benefits and importance of breastfeeding?
    a. Yes
    b. No **(GO TO QUESTION 17**)

16. How did your health care professional inform you of the benefits and importance of breastfeeding? **(Please circle all that apply)**
    a. Informational brochure
    b. Conversation with a nurse or doctor
    c. Consultation with a lactation consultant
    d. Other, please specify: _____

17. Was the infant feeding advice and guidance that you received from health care professionals, helpful?
    a. Yes
    b. No
    c. Somewhat helpful

18. Were prenatal classes offered and available to you at your health care center?
    a. Yes
    b. No
    c. Don't know

19. Did you or your infant have medical complications that inhibited breastfeeding initiation?
    a. Yes
    b. No
    c. Don't know
20. Was your infant breastfed at the first feeding?
    a. Yes

b. No

21. In the first two days after your infant was born, was your infant fed breast milk, formula or both?
    a. Breast milk at all feedings
    b. Formula at all feedings
    c. Combination

22. How long was your child **exclusively** breastfed after discharge from the hospital (only fed using breast milk, this includes expressed breast milk but no other food or liquids)?
    a. Did not breastfeed
    b. Less than 1 week
    c. 1 week to less than 1 month
    d. 1 month to less than 2 months
    e. 2 months to less than 3 months
    f. 3 months to less than 4 months
    g. 4 months to less than 5 months
    h. 5 months to less than 6 months
    i. 6 months or longer

23. At what age was your child when he or she stopped breastfeeding/drinking expressed breast milk (including times while supplementing with formula and complementary feeding)?
    a. Did not breastfeed
    b. Less than 1 week
    c. 1 week to less than 1 month
    d. 1 month to less than 2 months
    e. 2 months to less than 3 months
    f. 3 months to less than 4 months
    g. 4 months to less than 5 months
    h. 5 months to less than 6 months
    i. 6 months or longer

24. Did/do you plan to continue breastfeeding after your return to work?
    a. Yes
    b. No
    c. Did not breastfeed

25. Which best describes your employer granted maternity leave:
    a. Paid longer than 12 weeks
    b. Paid 12 weeks

c. Paid 6 weeks
d. Unpaid 12 weeks
e. Unpaid 6 weeks
f. Other, please specify: _____

26. What was your infant's age when you returned to work?
a. Younger than 1 week
b. 1 week to less than 1 month
c. 1 month to less than 2 months
d. 2 months to less than 3 months
e. 3 months to less than 4 months
f. 4 months to less than 5 months
g. 5 months to less than 6 months
h. 6 months or older
i.

Mothers who continued any amount of breastfeeding after discharge from hospital complete Section 3: Breastfeeding Support

Mothers who exclusively formula fed after discharge from hospital complete Section 4: Formula Feeding Mothers (Page 11).

SECTION 3: BREASTFEEDING SUPPORT:

3.1 Overall Support:

27. Which of the following people/sources have had an influence on your decision to breastfeed? **(Please circle all that apply)**

a. Partner
b. Friends
c. Infant's maternal grandmother
d. Infant's paternal grandmother
e. Other relative
f. Employer
g. Co-workers
h. Childcare provider
i. Community group
j. Media/Internet
k. Doctor
l. Nurse
m. Lactation consultant
n. Midwife
o. Breastfeeding or prenatal class
p. Other, please specify:_____
q. No one

28. Have any of the following made you feel like you should **not** breastfeed? **(Please circle all that apply)**

a. Partner
b. Friends
c. Infant's maternal grandmother
d. Infant's paternal grandmother
e. Other relative
f. Employer
g. Co-workers
h. Childcare provider
i. Community group
j. Media/Internet
k. Doctor
l. Nurse
m. Lactation consultant
n. Midwife
o. Breastfeeding or prenatal class
p. Other, please specify:_____
q. No one

29. When you decided to stop breastfeeding, did any of these reasons influence your decision to stop? **(Please circle all that apply)**
    a. I felt my partner did not help support me
    b. I felt my friends and other family members did not help support me
    c. I felt my employer did not help support me
    d. I felt my co-workers did not help support me
    e. I felt my health care professionals did not help support me
    f. I felt my childcare provider did not help support me
    g. I felt I had a lack of support in my community and other public settings
    h. None of these answers apply to me

    _____

    When applicable please answer questions based on the following scale and circle the one response that best describes your opinion:

    1=strongly disagree 2=disagree 3=neither agree or disagree 4=agree 5=strongly agree

3.2 Family & Friends:

30. You feel your partner supports and encourages breastfeeding.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

31. You feel women in your family, such as your mother, mother-in-law, aunts, and sisters encourage and support breastfeeding.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

32. You would feel comfortable breastfeeding around your family.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

33. You feel your friends support and encourage breastfeeding.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

34. You would feel comfortable breastfeeding around your friends.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

3.3 Health Care:

35. In your opinion, after the birth of your child, you were taught adequate skills to successfully breastfeed

    1 (strongly disagree) 2 3 4 5 (strongly agree)

36. Before leaving the hospital's birthing center you received sufficient information about breastfeeding support groups or services.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

37. If needed, you feel you could contact your health care professionals for breastfeeding guidance and help, after discharge from the hospital's birthing center.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

38. Overall, health care professionals have been supportive of your breastfeeding practices.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

3.4 Workplace:

39. In your opinion, your employer supports and accommodates breastfeeding in the workplace.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

40. In your opinion, at your workplace, breastfeeding accommodations are in a private area, sanitary, and provide enough comfort to allow for successful expression of breast milk.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

41. You would feel comfortable expressing breast milk at work if needed.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

42. In your opinion, your co-workers support and encourage breastfeeding

1 (strongly disagree) 2 3 4 5 (strongly agree)

3.5 Community/Public Settings:

43. You feel comfortable breastfeeding in public places.

1 (strongly disagree) 2 3 4 5 (strongly agree)

44. Have you ever felt too uncomfortable to breastfeed in a public place?
    a. Yes **(GO TO QUESTION 45)**
    b. No (**GO TO QUESTION 46)**

45. In what setting did you feel uncomfortable? **(Please circle all that apply)**
    a. Mall/store
    b. Office / office building
    c. Park or beach
    d. Place of worship
    e. Another person's private residence
    f. Public transportation
    g. Recreational facility
    h. Restaurant
    i. Other, please specify: _____

46. Have you ever been asked **not** to breastfeed in a public place when you have wanted to?
    a. Yes
    b. No

3.6 Childcare:

47. Who does your childcare?
    a. Childcare center
    b. Family daycare provider
    c. Other, please specify: _____

48. Your childcare provider is willing to feed expressed breast milk.

1 (strongly disagree) 2 3 4 5 (strongly agree)

49. Your childcare provider would allow you to breastfeed at their site before and after work.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

50. Your childcare provider would allow you to come in and breastfeed during lunch and other breaks if possible.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

51. Your childcare provider would be willing to thaw and prepare bottles of expressed milk.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

52. Your childcare provider will keep extra breast milk in a freezer for use if needed.

    1 (strongly disagree) 2 3 4 5 (strongly agree)

For mothers who have just completed <u>Section 3: Breastfeeding Support</u>, the questionnaire ends here. Thank you for taking part in the questionnaire and please know that your participation is appreciated.

SECTION 4: FORMULA FEEDING MOTHERS

53. In your opinion, did any of these reasons influence your decision not to breastfeed? **(Please circle all that apply)**
    a. I felt my partner would not help support me
    b. I felt my friends and other family members would not help support me
    c. I felt my employer would not help support me
    d. I felt my co-workers would not help support me
    e. I felt my health care professionals did not help support me
    f. I felt my childcare provider would not help support me
    g. I felt I had a lack of support in my community and other public settings
    h. None of these answers apply to me

54. Has anyone ever suggested or told you that you should **not** breastfeed?
    a. Yes; Please specify who: _____
    b. No

55. Have any of the following people made you feel like you should **not** breastfeed? **(Please circle all that apply)**

    a. Partner
    b. Friends
    c. Infant's maternal grandmother
    d. Infant's paternal grandmother
    e. Other relative
    f. Employer
    g. Co-workers
    h. Childcare provider
    i. Community group
    j. Media
    k. Doctor
    l. Nurse
    m. Lactation consultant
    n. Midwife
    o. Breastfeeding or prenatal class
    p. Other, please specify: _____
    q. No one

56. How important were each of the following reasons for your decision to formula feed your infant? **(Please mark an "X" in one box for each of the reasons listed)**

	Very important	Important	Somewhat important	Not important
I was unable to breastfeed due to medical reasons				
I had difficulties breastfeeding				
I believe that formula is as good as breastfeeding or that formula is better				
Infant's father didn't want me to breastfeed				
I wanted the baby's father to help with feeding				
Infant's grandmother didn't want me to breastfeed				
My friends were not supportive of breastfeeding				
I had a lack of resources for breastfeeding help				
Hospital staff did not teach me how to breastfeed				
I did not feel I received adequate training to successfully breastfeed				
I planned to go back to work or school				
Breastfeeding or expressing breast milk is not feasible at my workplace				
My child is cared for by a childcare provider, where I felt supplying breast milk was not an option				
I did not feel I could breastfeed in public places within my community				
I received formula for free				
Formula feeding is easier				
Breastfeeding is not the social norm				
Personal feeding preference				
Other reason: specify				

Thank you for taking part in the questionnaire and please know that your participation is appreciated!