Distribution Agreement

In presenting this thesis or dissertation as a partial fulfillment of the requirements for an advanced degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis or dissertation in whole or in part in all forms of media, now or hereafter known, including display on the world wide web. I understand that I may select some access restrictions as part of the online submission of this thesis or dissertation. I retain all ownership rights to the copyright of the thesis or dissertation. I also retain the right to use in future works (such as articles or books) all or part of this thesis or dissertation.

Signature:

_____ _____

Wendy Avila Date

In-Depth Assessment of Exclusive Breastfeeding Attitudes, Beliefs, Practices, and Key Influencers of Behavior in Villa Guadalupe, Managua

By

Wendy Avila
Master of Public Health

Behavioral Sciences and Health Education

_____
Karen Andes, PhD
Committee Chair

_____
Melissa Fox Young, PhD
Committee Member

_____
Ralph DiClemente, PhD, MSc
Committee Member

_____
Colleen McBride, PhD
Department Chair

In-Depth Assessment of Exclusive Breastfeeding Attitudes, Beliefs, Practices, and Key Influencers of Behavior in Villa Guadalupe, Managua

By

Wendy Avila

Bachelor of Arts
Emory University
2016

Thesis Committee Chair: Karen Andes, PhD

An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health
in Behavioral Sciences and Health Education
2018

Abstract

In-Depth Assessment of Exclusive Breastfeeding Attitudes, Beliefs, Practices, and Key Influencers of Behavior in Villa Guadalupe, Managua
By Wendy Avila

Background: Adequate nutrition within the first 1,000 days between a woman's pregnancy and a child's second birthday is critical for child development. To maintain low morbidity and mortality rates related to malnutrition, the World Health Organization recommends exclusive breastfeeding for the first six months of a child's life. Nicaragua, the second poorest country in Central America, experiences disparate rates of breastfeeding practices with high general breastfeeding rates and low exclusive breastfeeding rates. This disparity is distinct in communities with high malnutrition rates like Villa Guadalupe in the department of Managua. Manna Project International is a nongovernmental organization whose mission is to serve vulnerable populations similar to the one in Villa Guadalupe through their various programs, which include: The Villa Guadalupe Clinic and the Maternal-Child Nutrition program. One of their primary goals is to gain an understanding of the influential factors behind breastfeeding practices in order to implement programming that encourages exclusive breastfeeding.

Objective: To explore local attitudes, beliefs, practices, and key influencers related to exclusive breastfeeding in the Villa Guadalupe community in Managua, Nicaragua.

Methods: A qualitative assessment involving 20 in-depth interviews with mothers was used in this study. Mothers had to be 0-1 postpartum and residents of the Villa Guadalupe community.

Results: The Theory of Planned Behavior was employed for this study. Only two of the 20 women were practicing exclusive breastfeeding at the time of the interview. Results showed that the main barriers towards exclusive breastfeeding among this community adhered to the construct, perceived behavioral control and include work, mother's poor diet, perceived insufficient milk production, and pain and sickness.

In-Depth Assessment of Exclusive Breastfeeding Attitudes, Beliefs, Practices, and Key Influencers of Behavior in Villa Guadalupe, Managua

By

Wendy Avila

Bachelor of Arts
Emory University
2016

Thesis Committee Chair: Karen Andes, PhD

A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health
in Behavioral Sciences and Health Education
2018

Acknowledgements

I would like to express my deepest gratitude to my committee chair, Dr. Karen Andes, who has guided me through every step of this process. Without her guidance and persistent help, this thesis would not have been possible. My deepest gratitude also goes to my committee members Dr. Melissa Fox Young and Dr. Ralph DiClemente, whose expertise in nutrition and theoretical frameworks, respectively, guided my understanding of the data and helped me grow as a scholar.

I would also like to thank Emory University's Global Health Institute, for their financial support granted through their Global Health Field Scholar Award.

Un abrazo fuerte y muchisimas gracias to the In-Country Director, Christina Palazzo and Manna Project International for making this opportunity available to my team and me. And to my team, Daniel Balcazar and Samantha Persaud, thank you for your incredible work and making this experience an unforgettable one.

A special thank you to Ainee Jeong for the late nights and early mornings poring over drafts on drafts on drafts. I am extremely grateful to have such a supportive friend, willing to edit every part of this thesis from hundreds of miles away. My family, thank you for always being there. And from the bottom of my heart, thank you Nduka Vernon for always being ready with a supportive word and reassurance that everything will be okay.

Final thanks to the women who participated in this project. Thank you for opening up to me about your experiences and welcoming me into your homes with open arms.

Table of Contents

Chapter I. Introduction

Background and Context

The first 1,000 days between a woman's pregnancy and child's second birthday mark a crucial period in the child's development (World Health Organization (WHO), 2013; Bhutta et al., 2013; Birch & Doub, 2014). Nutrition during this period has a profound effect on a child's development, with adequate nutrition resulting in positive health outcomes including decreased mortality and morbidity, healthy brain development and higher intelligence quotient rates (WHO, 2013). Conversely, malnutrition or undernutrition during this period can cause irreversible damage to a child's development. Poor nutrition may lead to stunting and wasting, resulting in diminished capacity to learn, academic underperformance, and greater susceptibility to infection and disease (WHO 2013; Bhutta et al., 2013; Birch & Doub, 2014). The public health burden of malnutrition has a wide scope—nearly half of all deaths in children under five can be attributed to malnutrition (UNICEF, 2016). In order to prevent over three million deaths and ensure adequate nutrition worldwide, the WHO recommends the implementation of a number of programs, like focusing on the mother's prenatal nutrition, encouraging exclusive breastfeeding, and education on the introduction of complementary foods (WHO, 2013).

One of the most cost-effective, evidence-based interventions that the WHO recommends is exclusive breastfeeding (WHO, 2013; Bhutta et al., 2013; Victora et al., 2016). Exclusive breastfeeding is when an infant is fed … "no other food or drink, not even water, except breast milk (including milk expressed or from a wet nurse) for six months of life, but allows the infant to receive ORS, drops and syrups (vitamins, minerals and medicines)," (WHO, 2013). Implementing exclusive breastfeeding results in reduced hospital admissions rates related to respiratory illnesses and diarrheal diseases (Contreras 2015; Contreras et al., 2016; Victora et al.,

2016). Long-term effects of this practice include enhanced intelligence, increased work productivity, and economic development (Contreras 2015; Contreras et al., 2016; Victora et al., 2016).

While the benefits and advantages of breastfeeding are accepted internationally, exclusive breastfeeding rates remain low. For example, the exclusive breastfeeding rate in Low and Middle-Income Countries' (LMICs) is at 37% (Victoria et al., 2016). Low rates are evident in Nicaragua, the second poorest country in Latin America, where 30% of the population lives in poverty (MINSA, 2014; World Food Programme, 2018). Twenty-eight percent of children suffer from some form of undernutrition and 17% of children under the age of five suffer from chronic malnutrition (Sequeira et al., 2011; World Food Programme, 2018). While general breastfeeding rates are as high as 92%, exclusive breastfeeding in children aged four to five months was reported to be at 12% in 2012, highlighting the need to understand the underlying causes beneath this trend (MINSA, 2014).

In agreement with WHO recommendations, Nicaragua's Ministry of Health (MINSA) recognizes the advantages of exclusive breastfeeding. They recommend that women initiate breastfeeding within the first half hour post-partum and continue to breastfeed exclusively through the first six months of life (MINSA, 2014). Additionally, the need to increase rates of exclusive breastfeeding has long been documented through the Nicaraguan Demographic and Health Survey reports from 1998, 2006/07, and 2011/2013 (MINSA, 1999, 2008, and 2014). These national surveys show disparate breastfeeding rates across heavily populated departments like the capital of Managua; while the national average of exclusive breastfeeding is three months, in Managua it is less than two months (MINSA, 2014). Malnutrition rates are even more

distinct in communities with higher malnutrition and poverty rates like Villa Guadalupe in the department of Managua.

Problem and Significance

Villa Guadalupe is a planned resettlement community created by the Nicaraguan and Spanish governments. The community is inhabited by residents relocated from La Chureca, Central America's largest municipal trash dump, which was once home to over 1,000 individuals that survived off of sorting and selling recyclable items from the trash. When the landfill was closed, a recycling plant was established, which then created working opportunities for residents.

Flood victims from 2010 have also been relocated to this area, creating a settlement of 4,800 individuals that live on about $1.25 per day. Professor Karen Andes in the Hubert Department of Global Health at the Rollins School of Public Health, Emory University has been working in partnership in Villa Guadalupe with the non-governmental organization Manna Project International (MPI), a local organization with a 12-year presence in the community. This non-profit serves vulnerable populations through various programs including their Villa Guadalupe Clinic and the Maternal-Child Health Nutrition program. Past collaborations between Emory University and MPI resulted in a community needs assessment that identified high rates of malnutrition and food insecurity in the community (Emory University Global Health Institute Multidisciplinary Team, 2015). The needs assessment showed high rates of breastfeeding initiation at 86%, however rates of exclusive breastfeeding were lower at 45% (Emory University Global Health Institute Multidisciplinary Team, 2015). Additionally, exclusive breastfeeding was found to be limited to the first three months of the child's life, indicating a strong need for a fuller understanding of exclusive breastfeeding practices among women 0-6

months postpartum in order to adequately inform programming for MPI's Maternal-Child Nutrition program.

In order to address the high malnutrition rates in the community, MPI has developed a three-pronged program targeting the first 1,000 days of a child's life. Their new Maternal-Child Nutrition Program aims to target prenatal care, breastfeeding practices, and the introduction of complementary feeding. This qualitative study was designed as one part of a three-part study that addresses all three nutritional areas designated by MPI. This thesis focuses on the exclusive breastfeeding component: a qualitative study exploring the attitudes, beliefs, practices and key influencers of behavior regarding exclusive breastfeeding.

Primary Objective and Specific Aims

Given the limited existing data on the attitudes, beliefs, practices, or key influencers that affect a mother's exclusive breastfeeding practices in Villa de Guadalupe, this qualitative study sought to aid MPI's program development by gathering information on the contextual barriers and facilitators to exclusive breastfeeding.

Primary Objective

To explore local attitudes, beliefs, practices, and key influencers related to exclusive breastfeeding in the Villa Guadalupe community in Managua, Nicaragua.

Specific Aims

Aim 1: To gain in-depth information on women's breastfeeding attitudes, beliefs and practices in Villa Guadalupe.

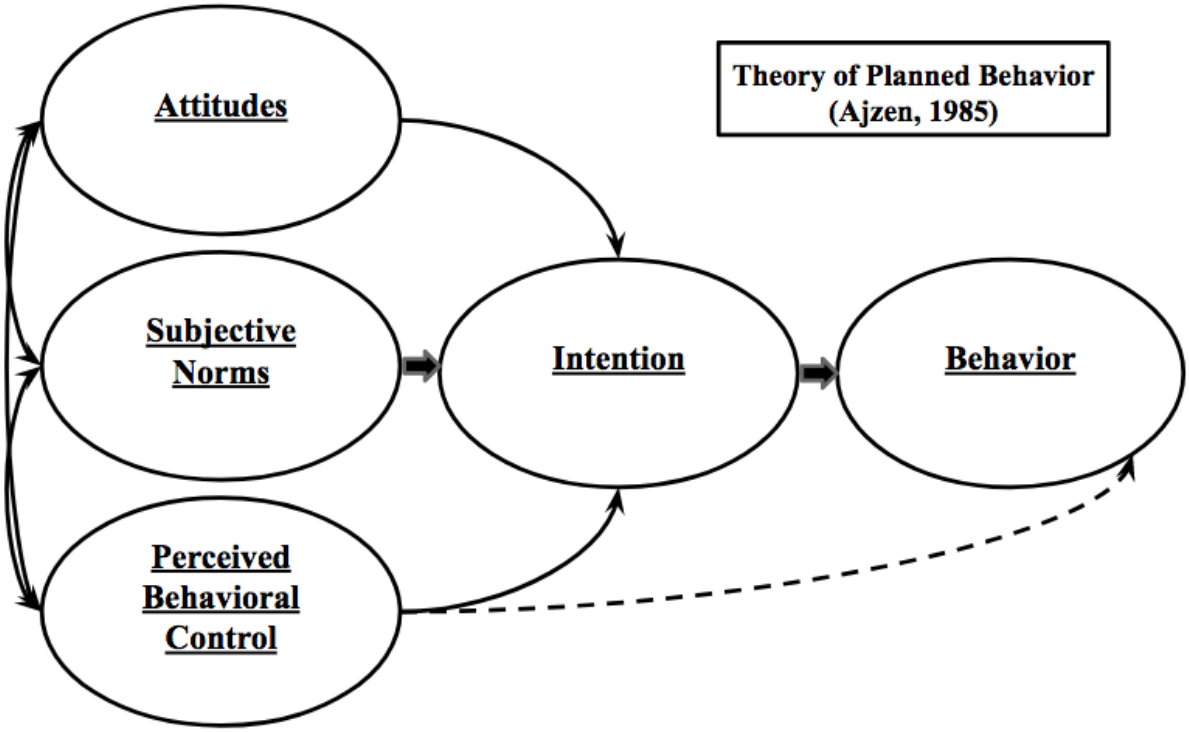
Aim 2: To explore the role of key influencers on supporting women.

Aim 3: To identify barriers and facilitators for breastfeeding to inform Manna Project International's program development.

Theoretical Framework

Exclusive breastfeeding practices vary in Managua. While some women breastfeed exclusively, others introduce water, formula, and solid foods early on (Picado et al., 1997; Espinoza 2002). Recognizing this existing variability in breastfeeding practices, the application of a theoretical framework with specific constructs that predict behavior is essential in understanding why some women practice exclusive breastfeeding and others do not. The Theory of Planned Behavior (TPB), a theory commonly employed by health psychologists, has been applied to examine the influences on both the intention to carry out a behavior and actual carrying out of the behavior (Ajzen, 1985). The Theory of Planned Behavior is not an independent theory, but instead an extension of the Theory of Reasoned Action, created in 1975 by Ajzen and Fishbein. The Theory of Reasoned Action assumes that individuals make rational decisions and that there are underlying reasons that motivate individuals to carry out a behavior (Fishbein & Ajzen, 1975). The Theory of Planned Behavior asserts that behavior is determined by the intention to carry out a behavior and the perceived control an individual has about that behavior. The constructs that help predict intention and behavior are attitudes, subjective norms, social norms, perceived power, and perceived behavioral control as depicted in Figure 1 below (Ajzen, 1985).

Figure 1. Diagram of Theory of Planned Behavior



Source: Adapted from Ajzen (1985).

This theory has been used to study behaviors ranging from condom use to breastfeeding (Wambach, 1997; Humphreys, Thompson, & Miner, 1998; Kloeblen, Thompson, & Miner 1999; Misra & James, 2000; Dogdson, Henley, Duckett, & Tarrant, 2003; Wambach & Koehn, 2004; Khoury, Moazzem, Jarjoura, Carothers, Hinton, 2005; McMillan, 2008). The implementation of TPB is necessary to better understand women's current attitudes, beliefs, social support and practices to positively influence MPI's work and achieve the overall objective of decreasing malnutrition in the community. The TPB constructs were used to create questions for an in-depth interview guide and to create codes for the data analysis.

Chapter II. Review of the Literature

Exclusive Breastfeeding

The universal implementation of exclusive breastfeeding or only feeding an infant breast milk for the first six months of their life, could prevent an estimated 823,000 annual deaths in children under five years in LMICs (Victora et al., 2016). In addition to decreasing malnutrition rates, exclusive breastfeeding leads to a 26% reduction in the odds of being overweight or obese in adulthood (WHO, 2013; Victora et al., 2016). Implementing this practice also leads to a 68% reduction in malocclusions, the imperfect positioning of teeth (Victora et al, 2016).

Breastfeeding benefits are not exclusive to children: the meta-analysis of 22 systematic reviews by Victora et al., (2016) indicates that breastfeeding can improve birth spacing and protect mothers against ovarian and breast cancer. Though these benefits are widely recognized, one of the main breastfeeding challenges in LMICs is the implementation of exclusive breastfeeding practices (Chaparro & Lutter, 2010; Victora et al., 2016). A different systematic review under the Lancet Breastfeeding Series, identifies determinants of breastfeeding (Rollins et al., 2016). Determinants include, hospital practices, influence from family members, particularly, their attitudes and preferences. For example, if a partner does not want his wife breastfeeding in public, a mother is less likely to breastfeed. In this study work is cited as the main reason for early weaning or not breastfeeding at all. At the individual level, subjective norms and benefits are mentioned as the strongest predictors of intention to breastfeed. Factors like inadequate support and anticipated breastfeeding difficulties tend to be barriers to breastfeeding across the literature. Introduction of milk substitutes is correlated with mother's perceived insufficient milk and the mother feeling as if her child is not full. This review also shows that health systems, the formula industry, and policies directly affect a women's ability to breastfeed.

National Statistics

Nicaragua's top health priorities per the Ministry of Health, include infant mortality, chronic infant malnutrition, and high prevalence of acute respiratory illnesses (MINSA, 2014). The capital, Managua, is directly impacted by these high infant mortality rates, with 29 deaths per 1,000 live births (Sequeira et al., 2011). Mortality rates and undernutrition are associated with suboptimal breastfeeding practices, but it is nationally recognized that general breastfeeding practices are not the main contributing factor (Sequeira et al., 2011). In fact, Nicaragua's national data shows that breastfeeding practices are higher among women with lower educational status (MINSA, 2014). Similarly, general breastfeeding practices are higher in rural communities with rates as high as 94-96% (MINSA, 2014). The Nicaraguan Health System Report pinpoints to the disparities between exclusive breastfeeding and breastfeeding as an important factor correlated with prevalence of these diseases (Sequeira et al., 201l; MINSA 2014).

Few studies have been carried out to further understand the disparities between breastfeeding and exclusive breastfeeding in Nicaraguan urban communities (Picado, Olson, & Rasmussen 1997; Espinoza, 2002). These findings indicate specific factors leading to increased or decreased rates of exclusive breastfeeding. For instance, Nicaraguan women who perceive exclusive breastfeeding as economically advantageous are more likely to carry out exclusive breastfeeding (Picado et al.,1997; Espinoza, 2002; Picado, 1999). Women report social systems as the primary influence in their decision to exclusively breastfeed (Espinoza 2002; Safon et al., 2016). In a study analyzing the association between family structure and exclusive breastfeeding practices, Espinoza (2002) reported lower levels of exclusive breastfeeding among women who reported a male as the head of household. In this same study, women who reported that another woman headed their household had higher rates of exclusive breastfeeding. In a qualitative study

conducted in León, Nicaragua, women discussed dismissing health professionals' advice if it contradicted their family members' advice (Safon et al., 2016). Family influence also played a role in women's decision to use breast milk alternatives or supplemental feeding, in fact, women were more likely to follow advice from mothers, grandmothers, and mothers-in-law before other influences likes spouses or health workers. As these results show, family influence plays a key role in women's decision to breastfeed and introduce other substances into their infant's diet. These different findings highlight the need to understand the impact that different key influencers have on women's intent to breastfeed exclusively in the context of Villa Guadalupe. The influence of gender is not only seen through key influencers such as partners or spouses but through the actual practice of exclusive breastfeeding as well; Espinoza (2002) reported that girls were exclusively breastfed for longer periods than boys. While this quantitative study shows those disparities, it does not give insight into the factors influencing this phenomenon, leaving a gap in the literature (Espinoza, 2002; Safon et al., 2016).

Biological factors also play an important role in women's ability or decision to exclusively breastfeed. In a study carried out in León, Nicaragua, 16 out of the 21 women participating in the study reported perceived insufficient milk, defined as the lack or shortage of breast milk, as the main reason for discontinuing the practice of exclusive breastfeeding during the first month postpartum (Safon et al., 2016). Women were anxious that their children would not receive the sufficient nutrition because of their inability to produce milk. These concerns were cited as the main driving factor for introducing substitutes to breast milk such as formula or other liquids. Women were also more likely to introduce substitutes if they thought their own nutrition was inadequate.

All of these studies also allude to women having some knowledge of the benefits and advantages of both breastfeeding and exclusive breastfeeding. The Safon et al., (2016) study specifically surveyed for knowledge, with results showing that women had specific knowledge of the practice and understood the outcomes of only introducing breast milk for the first six months of their infant's life. This discrepancy between knowledge and practice signifies that there are elements that need to be further studied. These studies suggest that there are multiple contributing factors besides knowledge that determine a women's decision to breastfeed, including: family structure and key influencers such as husbands, perceived economic advantages and disadvantages of exclusively breastfeeding, perceived insufficiency of milk, gender influences, socioeconomic status, and education. While these factors have been identified throughout the country, there is a lack of information in Villa Guadalupe, a community unlike any other because of the vulnerability of its citizens: resettled families from the municipal trash dump and flood zones. These studies also differ in their definition of exclusive breastfeeding, with some studies following exclusive breastfeeding up to four months or less, making these studies outdates when compared to WHO's 2001 recommendations that focus on exclusive breastfeeding for the first six months. For example, one study gave leeway for women to introduce other liquids "a *few times"* in the time span of a month, without defining what "few" meant in numerical terms and only following WHO's exclusive breastfeeding recommendations at the time prior to 2001 guidelines, which were up to four months of life (Picado, 1999). Only one of the studies, the most recent, Safon et al., (2016), used the current definition and recommendation of exclusive breastfeeding.

Theory of Planned Behavior

The Theory of Planned Behavior has been successfully applied to breastfeeding, both in the United States and internationally (Dodsgon et al., 2003; Conner & Sparks, 2005; Godin & Kok, 1996). One study reported that intended duration of breastfeeding was most strongly predicted by individuals perceived behavioral control and attitudes (Avery et al., 1998). This same study also demonstrated that demographic variables, intention and attitude all significantly predicted breastfeeding duration among a sample of first-time mothers in urban areas. The reliability and application of TPB to predicting behavior has been tested in multiple research studies, with some using the entire model and other using certain constructs of the model, showcasing the flexibility and wide application of the theory (Avery, Duckket, Dodsgon, Savik, & Henley, 1998; Dodsgon et al., 2003; Wambach, 1997).

This theoretical framework has been applied to explore determinants of breastfeeding intention and behavior among women of low-socioeconomic status or experiencing economic hardship internationally, showcasing varying results by context and study (Misra & James, 2000; Wambach & Koehn, 2004; Hawkins, Griffiths, Dezateux, & Law, 2007). One qualitative study focusing on economically disadvantaged adolescents in the United States, reported ambivalence towards breastfeeding (Wambach & Koehn, 2004). In different study examining self-reported behavior among 733 postpartum Medicaid beneficiaries in Mississippi, breastfeeding initiation was determined by attitudes regarding breastfeeding and subjective norms (Khoury et al., 2005). When women had knowledge about the health and emotional benefits of breastfeeding, if they felt embarrassed to do it in public, they were less likely to breastfeed: negative attitudes were negatively associated with intention to breastfeed. Subjective norms, or social support from lactation specialist and hospital nurses, was positively associated with breastfeeding intention.

Another subjective norm influence in this study included family members, mother's whose family encouraged formula-feeding were less likely to intend to breastfeed. This same study highlighted the role of demographic variables including ethnicity, education level, age, and marital status: older, white, non-Hispanic, college-educated, married women were more likely to breastfeed than formula feed following hospital discharge (Khoury et al., 2005). The diversity of both the application of the TBP and its findings makes it an ideal theoretical framework to provide the tailored recommendations to a specific context. The Theory of Planned Behavior can be applied to quantitative, qualitative, and mixed-methods studies.

The application of TPB in this qualitative study in Villa Guadalupe aims to contribute to our understanding on barriers and facilitators to exclusive breastfeeding and open a window of opportunity to provide the most adequate recommendations to increase exclusive breastfeeding and decrease malnutrition rates (Emory University Global Health Institute Multidisciplinary Team, 2015). To aid MPI's Maternal-Child Nutrition Program, information regarding the barriers and facilitators to exclusive breastfeeding must be contextualized and information should be based on a proven and effective theoretical framework, such as TPB.

Chapter III. Methods

Participants, Measures, and Procedures

To understand breastfeeding, attitudes, beliefs, practices, and key influencers among women in Villa Guadalupe, Nicaragua, a qualitative data collection strategy was employed. An in-depth interview guide (IDI) was created in English and then translated to Spanish. The Spanish guide used to conduct the interviews included 13 sections, beginning with the participants' informed consent and complete explanation of the study. The guide was based on

barriers and facilitators presented in existing literature, the needs of the MPI, and the TPB constructs. The final guide was composed of 50 questions with 11 of the questions capturing demographic data and another 11 questions using five constructs of the Theory of Planned Behavior: knowledge, attitudes, subjective norms, and perceived control, and intention (Ajzen, 1991).

The topics covered in the guide included pregnancy period, postpartum period, the first six months, breastfeeding while the mother is sick, exclusive breastfeeding knowledge, breastfeeding attitudes, subjective norms, perceived behavioral control, exclusive breastfeeding, and a closing section. Examples of questions asked for breastfeeding attitudes and subjective norms, include, "What happens to an infant if a mother decides to only breastfeed them for the first six months?" and "Does your partner support your breastfeeding?" Questions about breastfeeding experiences during the first six months include, "Did you experience any difficulties with breastfeeding your infant during the first six months?" Mothers were also asked questions about their perceived behavioral control. For example, "What factors complicate your ability to breastfeed?" and "What factors facilitate your ability to breastfeed?" A complete version of the Spanish guide used for the interviews is included in Appendix A.

Data collection occurred in collaboration with the Villa Guadalupe Clinic, founded by MPI to address the needs of the community, which is located in the heart of Villa Guadalupe. The clinic's staff assessed the Spanish guide for cultural competence in April 2017. The guide was then pilot-tested with a resident from the Villa Guadalupe community. Following the piloting of the guide, a total of 25 IDIs were carried out from May to August 2017.

Recruitment focused on mothers 0-1 years postpartum who were residents of Villa Guadalupe. Verification of residence was confirmed through either the records held at the Villa

Guadalupe Clinic or through participant self-reporting. No restrictions were applied on the mothers' ages. Convenience and snowball sampling was used for this study. Recruitment was carried out through three different methods: (1) the use of the MPI staff network, (3) participant referrals, (4) and recruitment at the clinic. Staff at the Villa Guadalupe Clinic helped initiate contact with Villa Guadalupe residents. Both the clinic's sign-in records and the list of past MPI program participants were consulted to create a list of possible participants.

The first four mothers received home visits from the principal investigator and MPI staff and volunteers. After the first four interviews, a snowball sampling method was employed and participants began referring the principal investigator to other women in Villa Guadalupe that also had children ages 0-1 years old. All women received home visits and were asked to participate in the research study by the principal investigator and a co-investigator involved in one of the other two nutritional parts of the study. The principal investigator led the interviews while the co-investigator took notes. Mothers that agreed to participate were then asked if they preferred that the interviews take place at the clinic or in their homes. Often participants would invite the investigators to their home and place chairs directly outside of their homes.

Participants were told that the purpose of the study was to create recommendations for MPI's future Maternal-Child Nutrition program. Additionally, they were informed of their right to discontinue the conversation and recording at any point during the conversation. Participants were asked to provide verbal consent at the beginning of each interview, in line with Emory's Institutional Review Boards recommendations on all studies. As the results of this study are not generalizable to other populations, and take into consideration a specific population with specific programming needs, the study was granted a letter of determination not requiring a review from Emory's Institutional Review Board.

Twenty-four of the 25 participants opted to use a pseudonym for the interview. Only one participant declined and used her legal name because of personal preference and religious views. Only 20 of the 25 interviews were used for analysis. Out of the interviews omitted for analysis, three of the interviews did not adhere to the residential criteria; while these were participants living near Villa Guadalupe, they were not directly part of the community. Proof of residence was re-verified with MPI staff after the interviews, showing discrepancies in their residential locations. The remaining two audio recordings were inaudible: one because the recorder stopped recording halfway through the interview and the other because the nearby noise was distracting enough to take away from the interview.

Data Analysis

Demographic information was analyzed using Microsoft Excel. Descriptive statistics were calculated for mother's age, educational level, employment status, civil status, number of children, number of people in each household, monthly salary, monthly spending on formula, and the infant's age.

The twenty interviews included in the analysis were transcribed verbatim by the principal investigator whose first language is Spanish. The interviews were transcribed with OTranscribe, a free, online software, and MAXQDA2018. The transcripts were checked for accuracy and quality by a co-investigator who is also fluent in Spanish. All transcripts were uploaded to MAXQDA2018 for thematic analysis (Bazeley, 2013), conducted by the principal investigator. An initial set of memos was applied following the first transcription of the first three audio recordings, which served as the basis for the initial codebook. The codebook underwent a series of three revisions, with the final edits instructed by the thesis advisor, Karen Andes. Inductive

codes were created as the interviews were being transcribed and during initial readings. An example of an inductive code is *tibio,* a Nicaraguan drink believed to help women produce breast milk. Deductive codes were developed based on existing literature on breastfeeding and the application the TPB. Examples of these codes include family and partner support, mother's diet, and health worker's advice and the final codebook is included in Appendix B.

Chapter IV. Results

Descriptive Statistics

The average age for participant was 24 with ages ranging from 16 to 41. The average age of their infant was four months, ranging from 11 days to 12 months. Fifty-five percent of the participants (n=11) attended secondary school, defined as grades seven through eleven and one participant reported attending college but not completing her degree. Seventy-five percent (n=15) of the mothers reported being unemployed at the time of the interview. Of the five that were employed, two were working in the recycling plant in La Chureca and three worked as small-scale vendors, selling items like beans and hand-crafted goods. One of the vendors, reported that she was part of a micro-loan cooperative program previously set up by MPI but now independent from the organization. Five were single at the time of the interview, and the remaining 15 reported either being married (n=4) or partnered/in a relationship (n=11). The average number of children among the participants was 2.3, with number of children ranging from one to seven. Five of the mothers were first time mothers, eight mothers had two children, and six had three. The average number of people living in each household was 8.1, including both family and non-family members. The reported average monthly income was $3,315 Cordobas, equaling to $106.25 in U.S. dollars. Fourteen mothers reported spending money on powered formula and

monthly average spent on powdered formula among these mothers was $561.43 Cordobas, equaling to $17.97 U.S dollars. Monthly money spent on formula among the 14 mothers ranged from $120 to $1,040 Cordobas.

Themes

Exclusive Breastfeeding

Out of all 20 mothers interviewed, only two, Madonna and Karen, reported practicing exclusive breastfeeding. At the time of the interview, Madonna's infant was 9 months old and Karen's child was 12 months old. All 18 mothers, even those with infants younger than six months reported having already introduced foods or substances at the time of the interview. Ten of the mothers reported only feeding their infant breast milk for the first three days. For these moms, reasoning and the timeframe for the introduction of other substances like water, and food varied.

Participants were asked about the term "lactancia materna exclusiva" or "exclusive breastfeeding," and the majority of the moms (n=15) did not know the definition or had not heard the term before, including the two who were actually practicing exclusive breastfeeding. However, unawareness of the term was not related to either the women's familiarity with the practice or perceptions about the effects of breastfeeding compared to powdered formula: most mothers had positive perceptions about the practice. When mothers were asked about the effects of only feeding the infant breast milk for the first six months of their life, 16 participants believed that it had positive effects. These participants discussed better growth and development, less chance of the infant getting sick, with diarrhea being brought up by different participants as

the main disease that could be avoided. A common theme among these participants was how using powdered formula is dangerous because of the bacteria the bottle can carry.

Interviewer: What do you think is more nutritious for a baby, breast milk or formula?

Elena: Breast milk

Interviewer: Why?

Elena: Because bottles can get contaminated if you don't wash them well, if you don't boil them.

If not washed or rinsed properly, the bottle can contaminate the milk and get the child sick. Similarly, when asked which method of feeding—formula or breast milk—was more beneficial and/or nutritious, all of these 16 participants responded breast milk. Two mothers did not believe that it had positive effects and two others were unsure about the effects on the infant. The same two mothers, Carmen and Cristina, who believed exclusivel breastfeeding has negative consequences also believed that formula was more nutritious and beneficial than breast milk. The other two mothers who were unsure about the effects of exclusive breastfeeding, Angelica and Andrea, believed that formula and breast milk were equally nutritious and beneficial. Cristina stated that she believed both were important for the child's development because formula contains important nutrients.

Interviewer: And what do you think is more nutritious for a baby, formula or breast milk?

Cristina: Well, breast milk because breastfeeding….but sometimes it is also good to give them formula because it has nutrients. You know that ... when a problem arises and I have to leave, to leave him with someone, if he only drinks breast milk, then I can't leave.

Interviewer: And what happens to a baby if the mother decides to only breastfeed them during the first six months of her life?

Cristina: Nothing. Because the first six months…well you are only supposed to breastfeed. Honestly, for me, it's negative, because it's also good to also give them formula, not just breast milk.

Intention to Breastfeed

Mothers were asked how and what they planned to feed their infants before their infants' birth. This open-ended question was used to explore mother's intention to exclusively breastfeed. Half (n=10) of the mothers intended to breastfeed their child and four planned on using formula. Out of the four mothers intending to use formula, all believed breastfeeding was better than formula and they had positive attitudes towards exclusive breastfeeding. One mother planned on using both formula and breastfeeding, and she talked about wanting to use formula so that she could be able to work. Five of the mothers either said they did not make plans or think about how or what they would feed their infants or did not fully understand the question. The two mothers that practiced exclusive breastfeeding in the sample did not intent to breastfeed—Madonna was ambivalent towards the question and Karen intended to use formula. The ten mothers that intended on breastfeeding brought up different barriers to being able to do so like having to work, not being able to produce enough milk, doctor's advice to formula-feed the infant, and their infant not wanting to be breastfed.

Formula, Substances, and Other Foods

All the participants that reported using formula, were asked to show the type of formula they used. The only formula used among the participants powdered formula—with different brands used. While Nicaraguan nationals refer to powdered formula as *leche de tarro* and the bottle as *pacha*, the participants used these two words interchangeably, using both of them to

describe powdered formula. When participants were asked why they introduced formula or why they were unable to breastfeed, eight mothers brought up competing responsibilities such as work, as shown by Jessica's response below.

> *Interviewer: And why do you use formula?*
>
> *Jessica: Because of necessity, because I have to work I use formula so that he can develop better, it's just part of life.*

While at the time of the interview, only five mothers reported being employed, other mothers discussed working at some point during the time they were breastfeeding their children. Fifty-five percent (n=11) of participants directly referred to work as a competing responsibility and a barrier to exclusive breastfeeding and breastfeeding in general. When mothers talked about working, they discussed it as a responsibility that was out of their control, something they had to do in order to survive. Mothers perceived breastfeeding as hard to control because of how it would conflict with mothers' working schedules. Some mothers talked about their infant's feeding schedule relying on their work schedule, with a combination of breastfeeding the child before work, formula-feeding during the day, and breastfeeding after work. In line with MPI's research interests, the participants were also asked if they used breast pumps, with one mother reporting using one. Most mothers did not understand the question, even after the principal investigator demonstrated how the device is used and what it is used for.

The second prominent theme that arose was pain or sickness, with different mothers experiencing sore or cracked nipples, back pain, and headaches. Participants also discussed giving formula when they became sick so they would not get their infant sick. Three mothers reported insufficient milk as another barrier to breastfeeding; they either believed that their

breast milk was not filling the child or that it was not nutritious enough. Two of the participants cited appearance, not wanting their breasts to change if they breastfed.

When mothers were asked why they believed other mothers in their community were unable or unwilling to breastfeed their children, the two main *reasons* were that they had to work or because of appearance. When participants discussed other mothers' reasons for not breastfeeding, they used more dismissive or negative wording.

> *Interviewer: Why do you think some women in your community may choose not to feed this way?*
>
> *Elena: Breastfeeding?*
>
> *Interviewer: Or exclusive for six months.*
>
> *Elena: Well, for me, women who don't breastfeed their children don't do it because they are lazy. Because they do not like sitting there with their child for half an hour, because it's boring, right, half an hour with the child until he doesn't want anymore. That's why they give them formula.*

There was less consensus around the introduction of foods and other substances within the Villa Guadalupe community. Women discussed introducing substances like "frescos," fresh juices believed to refresh the infant's stomach, and water in the first two months of the infant's life. This varied greatly with some mothers starting as early as the day the infant was born to three months. The introduction of foods including soups, chicken, beans, and rice also varied but usually took place around the third and fourth month. The most prominent pattern to arise from this data was that the four mothers who specifically referred to financial hardship such as not having sufficient funds to pay for everyday needs or having to skip meals because of not being able to afford food discussed the introduction of different substances and traditional remedies

like herbs, oregano, and lemongrass. Another participant talked about introducing chamomile and "agua gata," a thin mix of cornmeal and sugar, when her infant was two days old.

> *Francis: We call it ... my mom calls it* agua gata *("cat water"). When people don't have a way to buy milk, when they don't have anything. That happened with my sister. It also happened with my first child, I did not have milk. I would mix cornmeal with sugar, and he would drink it ... but he was used to drinking it with milk.*

There was one exception among the four women who discussed financial hardships; one woman who exclusively breastfed cited economic hardship as the main motivator.

Family and Partner Support

Partner Support

When participants were asked if their partners supported them during breastfeeding, 11 of the participants discussed feeling supported in different ways. Five of these 11 participants said that their partners advised them to breastfeed. The partners' advice varied with some partners telling the mothers the benefits of breastfeeding and others instructing mother to breastfeed the baby when the child cried. Three of the participants that felt supported by their partners mentioned that he gave them *tibio*, a Nicaraguan drink made of cornmeal served with warm water. Two of the participants felt they received direct partner support because their partners would take on chores like cooking or ironing so that they could breastfeed their children. An example of this is indicated by Kenya's response about her partner's support of her.

> *Kenya: Maybe I was breastfeeding and he would help me, after he came home from work he helped me cook. Since I iron his clothes, when he sees that I'm really busy with the baby, he lets me take care of the baby, and when our daughter goes to school, he now*

bathes her alone, clothes her, and brushes her hair, puts on her perfume and takes her to class for me.

One participant felt supported because her husband would give her advice on what to eat to benefit both her and the child. He would advise her on which types of food would make her sick and which types of food would be nutritious for the baby.

The majority mothers that discussed not feeling supported by a partner were all single mothers. Reasons for not feeling supported were diverse, including no longer having a romantic relationship with that partner or that partner not claiming the child as his own. The mothers that were partnered and did not feel supported also discussed having relationship issues.

Family Support

Family members play a similar role in supporting the mother's breastfeeding. Three participants received advice from family members on what to eat to maintain a healthy diet for both themselves and their infant. The family members offering this type of advice varied, with some citing their mothers and others their aunts and cousins. Mothers said they felt supported when other lactating mothers in the household breastfed the infant. Similar to the partner's role, family members not only advised the mother to drink *tibio* to encourage milk production but would also buy the supplies to make it or bring it to the mother in the hospital or her home.

Mother's Diet

Insufficient Food

A majority of mothers (13) stated that having more food or better nutrition would allow them to produce more or better milk. Mothers talked about feeling weak when they breastfed because they felt as if their child was taking nutrients from them. In the later interviews, mothers

discussed their own diets and their beliefs of what they should and should not be eating. Francis said her family told her she should not eat beans or rice. Similarly, Andrea's family advised her that she should not eat pork, beans, avocado, or eggs. She notes that her diet consists of drinking *tibio*, eating a tortilla, and cheese. Ideas regarding the mother's diet while breastfeeding did not surface until the later interviews, not allowing for an in-depth of practices and perceptions about the impact of different foods.

Tibio

Mothers who did not have enough food, or enough nutritious food, felt that they were producing inferior milk that could have unintended negative effects on their infant's health. When discussing their diet, mothers felt that their food options and diet were out of their control because of their economic situation. They tried to improve the amount and the quality of their breast milk by drinking *tibio.* Historically and traditionally, *tibio* forms part of the Nicaraguan identity. In Nicaraguan society, nationals refer to themselves as *pinoleros*, translating into pinol drinkers. *Tibio*—believed to help breast milk production among residents of the Villa Guadalupe community—is a version of *pinol. Pinol*, is made of toasted cornmeal (dry, grounded corn) with room temperature water or milk. Other spices and substances like pepper, salt, vanilla, cinnamon, and can be added to the drink to enhance flavor. When *pinol is* mixed with toasted cacao and room temperature water or milk, it is referred to as *pinlollio.* When either *pinol, pinolillo*, or a version of these drinks is made with hot or warm water or milk, it is referred to as *tibio,* which directly translates to the word warm or hot.

While the drink is widely accepted to enhance breast milk among this community, there is no existing evidence to support this claim and misconceptions about the nutritious value of this drink may be affecting mother's diet.

Information from Health Workers and Specialists

Fifteen of the mothers reported having received advice from a health professional regarding their infant's nutrition when they were receiving prenatal care. These included doctors, gynecologists, nutritionists, pediatricians, or community health professionals. The majority of these women valued the advice they received and said they would intentionally seek information from a health worker or specialist regarding their infant's nutrition. When asked about conflicting advice, most women said they would pick a specialist or health worker's advice before turning to their family. When asked about their preferred method of receiving information about their infant's nutrition, they preferred *charlas*, or small talks, given in group setting. Two women specified wanting printed material and a few discussed wanting a combination of *charlas* and individualized, one-on-one conversations with professionals.

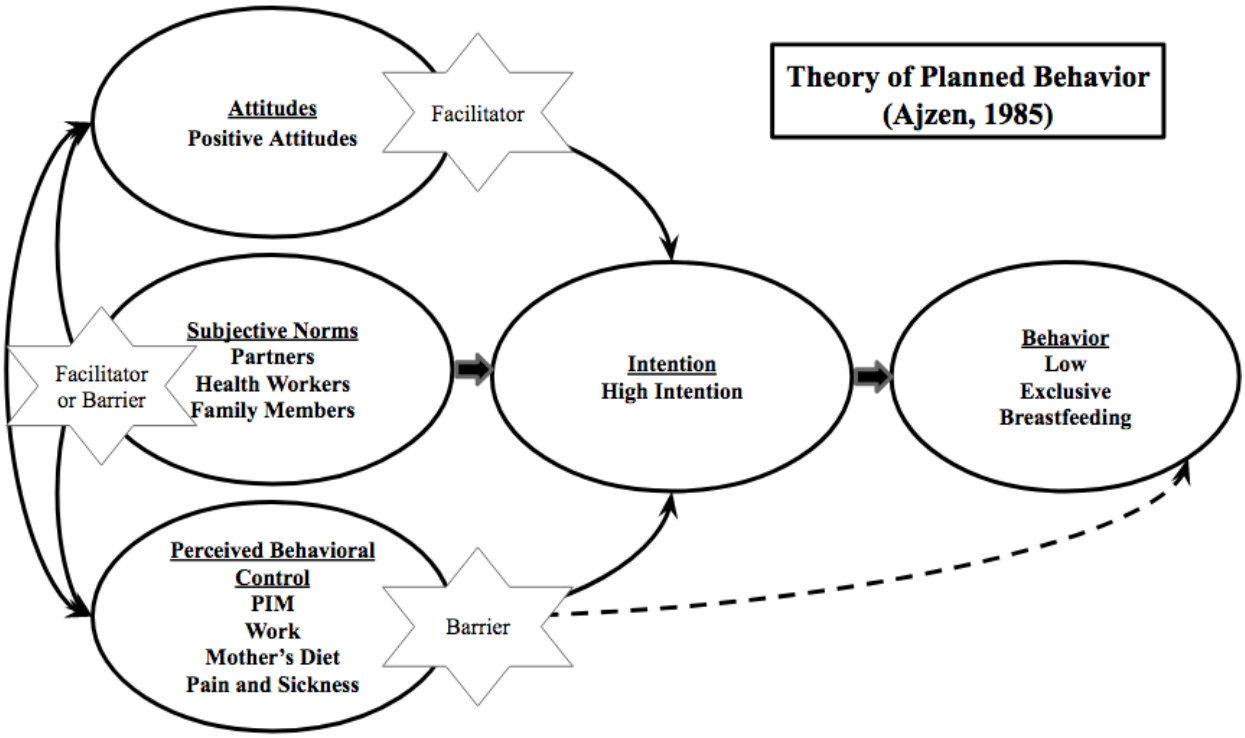
Chapter V. Discussion

Introduction

Application of the Theory of Planned Behavior's constructs—attitudes, subjective norms, perceived behavioral control and intention—to the findings suggest that there are a number of barriers and facilitators of exclusive breastfeeding in the Villa Guadalupe community. The main facilitator for exclusive breastfeeding among this cohort of 20 women was the attitudes construct. Positive attitudes about the effects of exclusive breastfeeding was a salient theme in these interviews. Unlike attitudes, the construct subjective norms can serve as either a facilitator

or norm. These individuals' support and advice to the mother, or lack thereof, play an important role in influencing the mother's decision on breastfeeding and formula-feeding. In the case of the Villa Guadalupe community, the theoretical construct—perceived behavioral control—offers a more in-depth understanding of why mothers do not exclusively breastfeed. Perceived behavioral control, diet, work, and pain and sickness were the prominent barriers discussed by these participants. The application of the theoretical constructs study's findings is visually depicted in Figure 2.

Figure 2. Theoretical Constructs Applied to Results

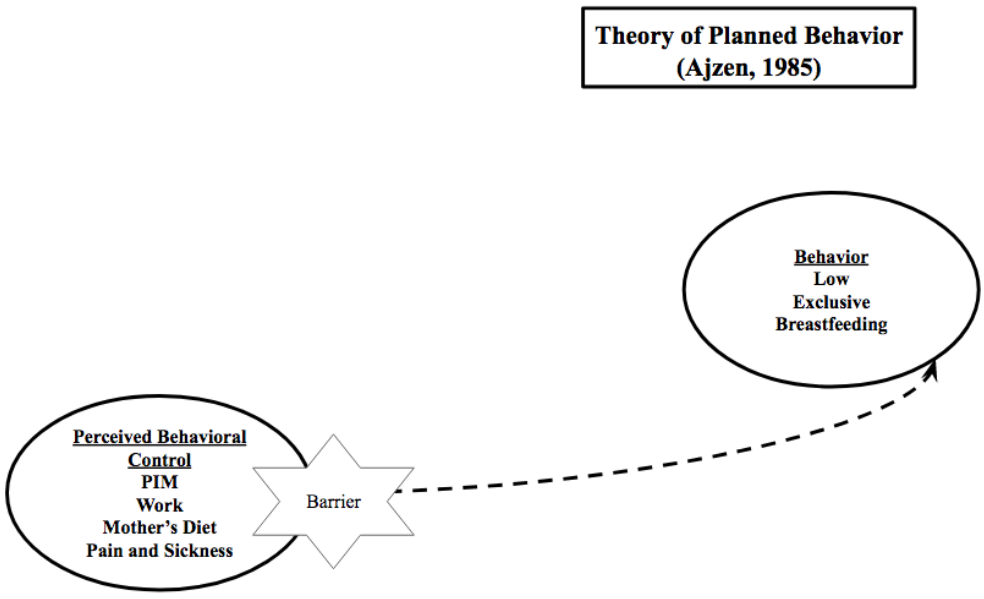


Source: Adapted from Ajzen (1985)

The barriers highlighted in the results (PIM, work, mother's diet, pain and sickness) coincide with the barriers cited on breastfeeding and exclusive breastfeeding literature (Godin &

Kok, 1996; Picado et al., 1997; Espinoza 2002; Dodgson et al.,2003; Conner & Sparks, 2005; Safon et al., 2016; Rollins et al., 2017). For example, internationally, work is the most prominent reason for a mother's decision to stop breastfeeding (Rollins et al., 2017). Results of this study also differ from the literature in regard to the role of the construct intention. Intention has been shown to be closely associated with behavior in other studies, particularly in quantitative studies, where intention and behavior have a linear relationship: if intention is high, so is behavior uptake (Khoury et al., 2005). In this context, while most mothers discussed intending to breastfeed their infant, only two of the mothers reported practicing exclusive breastfeeding at the time of the interview, making it unclear what the role of intention is and if this serves as a predictor of exclusive breastfeeding among women in Villa Guadalupe. The findings suggest that perceived behavioral control and its direct path to behavior—as shown in Figure 3 below—are a strong influence on exclusive breastfeeding among this community, calling for focus and programmatic intervention in this area.

Figure 3. The Role of Perceived Behavioral Control on Exclusive Breastfeeding



Source: Adapted from Ajzen (1985).

The Role of Poverty

Three of the four barriers presented under perceived behavioral control, PIM, work, and mother's diet are directly tied to the precarious financial situation found in Villa Guadalupe. With most individuals living on a $1.25 per day, poverty directly impacts mothers' ability to exclusively breastfeed. Oftentimes, all family members have to work in order to sustain themselves, with the consequence of the mothers having to work as well. Similarly, poverty dictates availability and quality of food—mothers who cannot afford to buy nutritious foods have limited diets, directly affecting their breast milk production.

Recommendations

Taking into consideration the role of the present barriers and facilitators on exclusive breastfeeding in Villa Guadalupe, there is ample opportunity for programmatic implementation. Research on best methods for breastfeeding program implementation have shown that multicomponent interventions focusing on multiple aspects of the 1,000 days, including both prenatal and postnatal care, are most effective (Rollins et al., 2016; Kim et al., 2018). For example, interventions targeting the mothers' and family members' education has resulted in a 20% increase in exclusive breastfeeding rates (Rollins et al., 2016; Kim et al., 2018). Based on the multicomponent intervention, three different areas should be enhanced and promoted: (1) the mother's nutrition, (2) the role of the health worker or provider and (3) engagement of family members and partners.

As poverty has a direct impact on the mothers' nutrition, an area of opportunity for Manna Project International is to connect women to direct food sources that provide a sufficient amount of healthy food, including fruits, proteins, and vegetables. As the last interviews demonstrate,

there are varying ideas concerning nutrition for mothers; education implementation for women on best nutrition would be beneficial for the community. Education could focus on both prenatal and postnatal care so that women are aware of best practices for themselves and their children. Education on the mother's nutrition could be disseminated to the mothers in different ways, including *charlas*, which are already implemented by MPI, and one-on-one advice from health care workers. These methods were among the most memorable for the 20 women interviewed. Additionally, the use of *tibio* and its wide acceptance throughout Nicaragua and Villa Guadalupe present a cultural opening to utilize for community engagement and nutritional supplementation.

Participants discussed valuing health workers' and experts' advice regarding their children's nutrition. When women were asked who they received information from about their infant's nutrition, most mothers brought up the healthcare workers who were directly involved in the mother's prenatal care. Training health workers directly serving the Villa Guadalupe community would aid MPI's mission of improving nutrition among the Villa Guadalupe community. While there is only one other clinic directly located in the community, Centro Salud–there is also opportunity to target the hospitals at which women give birth. Additionally, if this recommendation is outside of the scope of MPI's power or mandate, local lactation consultants can be introduced to help women understand breastfeeding practices better. Lactation consultants can also address the fourth barrier under perceived behavioral control: pain and sickness. This study did not address coping methods for back pain, sore or cracked nipples, or headaches, and it is unclear whether mothers know how to best treat these symptoms. Lactation consultants could serve as sources of support for women experiencing pain by helping them understand methods to alleviate somatic complaints.

Last, family members and partners can serve as either barriers or facilitators. Education programs targeting these key influencers has the potential to encourage exclusive breastfeeding.

Future Research

Areas for further research include an in-depth assessment of mothers' beliefs regarding their own diets and the role they play in the quantity and quality of their breast milk. Further research should also be carried out to determine the nutritional value of *tibio*, which could result in recommendations for or against this drink. Additionally, while it is recommended that health workers be trained on best advice to give mothers about exclusively breastfeeding for the first six months, this study did not directly capture the advice given to mothers from different health workers. One mother did say that she stopped exclusively breastfeeding at 4 months because her doctor told her to. This brings into question whether physicians and health workers are giving mothers information in accordance to outdated WHO recommendations, which prior to 2001 advised breastfeeding until four months.

The interviews also did not get a comprehensive understanding of the role of initiation and exclusive breastfeeding. Attitudes towards colostrum, or the first form of milk produced by the mammary glands, and its effects are unclear. The literature shows that initiation and colostrum are directly tied to exclusive breastfeeding practices, but in the context of Villa Guadalupe, this relationship is unclear.

Opportunities for studying the implementation of a low-resource friendly breast pump exist. Work was the most salient barrier to exclusive breastfeeding, and breast pumps give women the opportunity to fulfill work responsibilities while ensuring their infant is provided breast milk. It is unclear whether this would be successful in this setting since one of the concerns about formula was bottle hygiene. Observational studies including hygienic practices

for bottles and mother's actual breastfeeding techniques can help in providing further recommendations for lactation consultants.

In line with the literature, this study assessed individual and societal barriers without including a holistic look at the political and environmental barriers to exclusive breastfeeding. The literature shows that formula marketing has played a large role in attitudes regarding formula-feeding, with entire communities perceiving it as the superior method of feeding. The role of this type of marketing is unclear in Villa Guadalupe. Similarly, policies implemented by the national and local governments have an effect on exclusive breastfeeding. While the Nicaraguan Ministry of Health recommends exclusive breastfeeding, the national insurance program provides its employees with free powdered formula for the first six months of their children's lives.

Limitations

Only 20 of the 25 interviews carried out were used for analysis. Since this study did not reach saturation, and important information was brought in the later interviews, rich information could have been lost in the missing five interviews.

While the principal investigator's first language is Spanish, there are nuances in Nicaraguan Spanish with which the investigator was unfamiliar. Though the principal investigator was born and raised in Central America, there are various differences between cultures that were not fully understood in real time as the interviews were taking place. This hindered the principal investigator's ability to probe and led to confusion regarding certain terms and practices. For example, there was misunderstanding of the term *pacha*, which was discovered to be powdered formula, or bottled milk. Oftentimes, terms or practices were explained after debriefing interviews with the other co-investigators or MPI staff.

Additionally, a number of interviews took place in the participants' homes, which consist of large families. While participants were asked to talk in more private spaces, a significant portion of interviews took place with mothers and partners in the room. This impeded privacy and possibly led to the introduction of social desirability; participants may have answered questions differently based on the presence of certain family members.

Conclusion

The preliminary findings of this research have been used to pilot MPI's new maternal and child health nutrition program, now titled *1,000 Days*, in Villa Guadalupe, Nicaragua. The final results provided in this thesis will also be shared with the MPI In-Country Director to provide further recommendations for the full implementation of the program. In the case of Villa Guadalupe, the Theory of Planned Behavior served in gaining in-depth understanding of the attitudes, beliefs, practices, and key influencers of exclusive breastfeeding. Understanding the barriers and facilitators present will allow MPI to implement resources efficiently and effectively, targeting mothers and their infants in order to decrease malnutrition and the high morbidity and mortality rates that result from it.

References

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In *Action control* (pp. 11-39). Springer Berlin Heidelberg.

Avery, M., Duckett, L., Dodgson, J., Savik, K., & Henly, S. J. (1998). Factors associated with very early weaning among primiparas intending to breastfeed. *Maternal and Child Health Journal*, *2*(3), 167-179.

Bazeley, Patricia. (2013). Qualitative Data Analysis: Practical Strategies. Thousand Oaks: Sage Publications.

Bhutta, Z. A., Das, J. K., Rizvi, A., Gaffey, M. F., Walker, N., Horton, S., Webb, P., Lartey, A., &Black, R. E. (2013). Evidence-based interventions for improvement of maternal and child nutrition: What can be done and at what cost? *The Lancet, 382*(9890), 452-77. doi: http://dx.doi.org.proxy.library.emory.edu/10.1016/S0140-6736(13)60996-4.

Birch, L. L., & Doub, A. E. (2014). Learning to eat: Birth to age 2 y. *The American Journal of Clinical Nutrition, 99*(3).

Chaparro, C. M., & Lutter, C. K. (2010). Increases in breastfeeding duration observed in Latin America and the Caribbean and the role of maternal demographic and healthcare characteristics. *Food and nutrition bulletin*, *31*(2_suppl2), S117-S127.

Contreras, M. (2015). *Child nutrition in rural Nicaragua: Population-based studies in a transitional society* (Doctoral dissertation, Acta Universitatis Upsaliensis).

Contreras, M., Zelaya Blandón, E, Persson, LÅ, and Ekström, EC. (2016) Consumption of highly processed snacks, sugar-sweetened beverages and child feeding practices in a rural area of Nicaragua. Maternal and Child Nutrition, 12: 164–176. doi: 10.1111/mcn.12144.

Dodgson, J. E., Henly, S. J., Duckett, L., & Tarrant, M. (2003). Theory of planned behavior-based models for breastfeeding duration among Hong Kong mothers. *Nursing Research*, *52*(3), 148-158.

Emory University Global Health Institute Multidisciplinary Team (2015). Community Health Needs Assessment: Preliminary Report.

Espinoza, H. (2002). The relationship between family structure and exclusive breastfeeding prevalence in Nicaragua. *Salud Publica Mexico*, 44(6), 499–507.

Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*.

Hawkins, S. S., Griffiths, L. J., Dezateux, C., Law, C., & Millennium Cohort Study Child Health Group. (2007). The impact of maternal employment on breast-feeding duration in the UK Millennium Cohort Study. *Public health nutrition*, *10*(9), 891-896.

Humphreys, A. S., Thompson, N. J., & Miner, K. R. (1998). Assessment of breastfeeding intention using the transtheoretical model and the theory of reasoned action. *Health Education Research, 13*(3), 331-341.

Humphreys, A. S., Thompson, N. J., & Miner, K. R. (1998). Intention to breastfeed in low-income pregnant women: The role of social support and previous experience. *Birth, 25*(3), 169-174.

Kloeblen, A. S., Thompson, N. J., & Miner, K. R. (1999). Predicting breast-feeding intention among low-income pregnant women: A comparison of Two theoretical models. *Health Education & Behavior, 26*(5), 675–688.

Khoury, A. J., Moazzem, S. W., Jarjoura, C. M., Carothers, C., & Hinton, A. (2005). Breast-feeding initiation in low-income women: Role of attitudes, support, and perceived control. *Women's Health Issues*, *15*(2), 64-72.

McMillan, B., Conner, M., Woolridge, M., Dyson, L., Green, J., Renfrew, M., & Clarke, G. (2008). Predicting breastfeeding in women living in areas of economic hardship: Explanatory role of the theory of planned behaviour. *Psychology and Health*, *23*(7), 767-788.

Ministerio de Salud. (1999). Encuesta Nacional de Demografia y Salud, Nicaragua, 1998. *Macro International.*

Ministerio de Salud. (2008). Encuesta Nacional de Demografia y Salud, Nicaragua, Informe Final, 2006-2007. *Centers for Disease Control and Prevention.*

Ministerio de Salud. (2014). Encuesta Nacional de Demografia y Salud, Nicaragua, Informe Final, 2011-2012. Instituto Nacional de Informacion de Desarollo.

Misra, R., & James, D. C. S. (2000). Factors associated with breastfeeding duration and initiation in Missouri. *Journal of the American Dietetic Association*, *100*, 1071-1073.

O'Campo P., Faden R.R., Gielen A.C., & Wang M.C. (1992) Prenatal factors associated with breast-feeding duration: Recommendations for prenatal interventions. Birth 19:195-201,

.

Picado J.I., Olson C.M., & Rasmussen K.M. (1997) Metodología combinada para entender la duración del amamantamiento en barrios pobres de Managua, Nicaragua [A combined methodology for understanding the duration of breastfeeding in the poor neighborhoods of Managua]. Rev Panam Salud Publica;2(6):398-407.

Picado, J. I. (1999). *Understanding exclusive breastfeeding from the perspective of low-income mothers from managua, nicaragua* (Order No. 9941191). Available from ProQuest Dissertations & Theses A&I; ProQuest Dissertations & Theses Global. (304502384). Retrieved from

https://login.proxy.library.emory.edu/login?url=http://search.proquest.com.proxy.library.emory.edu/docview/304502384?accountid=10747

Safon, C., Keene, D., Guevara, W. J. U., Kiani, S., Herkert, D., Muñoz, E. E., & Pérez-Escamilla, R. (2016), Determinants of perceived insufficient milk among new mothers in León, Nicaragua, Maternal & Child Nutrition, doi: 10.1111/ mcn.12369.

Sequeira, M., Espinoza, H., Amador, JJ., Domingo, G., Quintanilla, M., & de los Santos, T. (2011). The Nicaraguan Health System. Seattle, Washington: PATH.

Rollins, N. C., Bhandari, N., Hajeebhoy, N., Horton, S., Lutter, C. K., Martines, J. C., & Victora, C. G. (2016). Why invest, and what it will take to improve breastfeeding practices? *The Lancet*, *387*(10017), 491-504.

UNICEF. (2016, July 20). The faces of malnutrition. Retrieved from https://www.unicef.org/nutrition/index_faces-of-malnutrition.html

United Nations Population Fund Nicaragua (2012). Encuesta Nicaraguense de Demografia Salid 2011/12: Ministerio de Salid. Instituto Nacional de Desarollo (INDIE).

Victora, C. G., Bahl, R., Barros, A. J. D., França, G., V.A., Horton, S., Krasevec, J., & Rollins, N. C. (2016). Breastfeeding in the 21st century: Epidemiology, mechanisms, and lifelong effect. *The Lancet, 387*(10017), 475-490. doi: http://dx.doi.org.proxy.library.emory.edu/10.1016/S0140-6736(15)01024-7

Wambach, K. A. (1997). Breastfeeding intention and outcome: A test of the theory of planned behavior. *Research in nursing & health*, *20*(1), 51-59.

Wambach, K. A., & Koehn, M. (2004). Experiences of infant-feeding decision-making among urban economically disadvantaged pregnant adolescents. *Journal of Advanced Nursing*, *48*(4), 361-370.

World Health Organization (2013). Essential nutrition actions: improving maternal, newborn, infant and young child health and nutrition.

World Food Programme. (2018). Nicaragua. Retrieved from http://www1.wfp.org/countries/nicaragua

Appendix A: Spanish In-Depth Interview Guide
Número de la entrevista: _____
Seudónimo: _____
Casa_____
Fecha: _____

La lactancia materna exclusiva en Villa Guadalupe, Nicaragua: Guía de entrevistas en profundidad para madres

Introducción*:*

Gracias por aceptar una entrevista hoy. Mi nombre es Wendy Avila y soy una estudiante de la Universidad Emory que está ubicada en el estado Georgia, Estados Unidos. Estoy llevando a cabo esta entrevista con usted para un proyecto que guiará el futuro del programa de nutrición materna e infantil del Proyecto Internacional Manna (Manna Project International).

Esta entrevista es para entender sus puntos de vista sobre la lactancia materna. Estoy aquí hoy para hablarle sobre sus propios conocimientos y experiencias. Su participación en esta entrevista es completamente voluntaria, y puede detener la entrevista en cualquier momento. Esta entrevista tomará aproximadamente 30 minutos.

Antes de que tenga lugar la entrevista, me gustaría hacerle algunas preguntas demográficas básicas sobre usted y su bebe. ¿Está de acuerdo?

Iinformación demográfica básica:

1. ¿Qué edad tiene?
2. ¿Asistió a la escuela? En caso afirmativo, ¿cuál es el nivel más alto de escolaridad que recibió?
   Opciones: a) primaria b) secundaria c) universitaria d) título de postgrado e) otras
3. ¿Está empleada actualmente?
   Opciones: a) sí b) no c) otro _____
3a) En caso afirmativo, ¿cuál es su ocupación?
4. ¿Usted es casada, soltera, o emparejada?
4a) ¿Vive con su pareja / compañero?
   Opciones: a) sí b) no c) otro _____
5. ¿Está su pareja / compañero actualmente empleado?
   Opciones: a) sí b) no c) otro _____
5a) En caso afirmativo, ¿cuál es su ocupación?
6. ¿Cuántos hijos tiene?
7. Por favor llene la siguiente tabla con el nombre del niño, su edad y su sexo:

Nombre del niño/a	**Edad**	**Sexo**	**¿Actualmente amamantado?**

8. ¿Cuantas personas viven en esta casa? ¿Quién más vive con usted en su casa?
9. ¿Quién es el jefe de familia?
   a) la entrevistada b) la/el pareja/ compañero c) la madre d) el padre e) la abuela f) el abuelo g) la suegra h) el suegro
10. ¿Cuánto es su salario mensual o el salario de su pareja/ compañero?
11. ¿Cuánto gasta en la fórmula (leche de bote o leche de tarro) por mes?

Gracias por compartir esa información conmigo. Con su permiso, quisiera grabar nuestra conversación para asegurarme que recuerde todo correctamente. Sólo mis colegas tendrán acceso a las grabaciones, y después de haber usado las grabaciones para anotar lo que dijo, eliminaremos toda la información. Un nombre falso será asignado a esta entrevista y su nombre real no será asociado con las respuestas. ¿Tiene un nombre que le gustaría usar?

¿Tiene alguna pregunta para mí?

¿Tengo permiso para grabar nuestra conversación?

¿Está lista para comenzar?

Sección 1: Periodo de embarazo
Vamos a seguir adelante y discutir su embarazo con su bebe más reciente y su experiencia con eso.

1. ¿Puede decirme sobre su embarazo con (nombre del bebé)?
   Sondeo: ¿Cómo se sintió durante el embarazo? ¿Se sintió enferma desde el principio? ¿Hubo alguna complicación?
2. Cuando estuvo embarazada, ¿buscó atención prenatal?
   a. ¿Alguien la examinó?
   b. ¿Quién la examinó?
   c. ¿Por qué no busco atención prenatal?
3. ¿Esta persona le dio consejo acerca de la alimentación de su bebé?
4. ¿Quién más ofreció consejos sobre la alimentación de (nombre del bebé) cuando estaba embarazada?
5. ¿Cree usted que recibió buenos consejos con de cómo alimentar a su bebé?
6. Si los consejos eran conflictivos, ¿cuál de esos consejos siguió y por qué?
7. ¿Ahora que es mama, que información desea que le hubieran dado cuando estaba embarazada acerca de la lactancia materna?
8. Antes de que naciera (nombre del bebé), ¿cómo planificó darle de comer? ¿Por qué?

Sección 2: Parto y período postparto:
¿Podría hablarme de su parto más reciente?

9. ¿Dónde dio a luz a (nombre del bebé)? ¿En qué lugar?
10. ¿Tuvo un parto vaginal o una cesárea?
11. ¿Tuvo alguna dificultad durante el parto?
12. ¿Quién estuvo presente en la habitación cuando nació (nombre del bebé)?
13. ¿Cuándo le pusieron al bebé para darle pecho por primera vez?
    Sondeo: ¿Después de cuántos minutos o horas o días?
14. ¿Tuvo problemas para iniciar la lactancia materna?
    Sondeo: Esto podría ser el bebé teniendo problema prendiéndose, pezones invertidos de la mamá, mamá que no produce bastante leche, bebé que no chupa con eficacia, etc.

15. ¿Qué hizo con la primera leche que le bajo? ¿Por qué?
16. ¿Le ayudó alguien a iniciar la lactancia materna? ¿Quien?
17. ¿Tuvo problemas durante los primeros días después del nacimiento, cuándo le bajó la leche?
18. Y después de esa primera semana, ¿cómo le fue la lactancia materna?

    Sondeo: ¿Siente que su cuerpo produjo suficiente leche? ¿Estaba creciendo bien su hijo? ¿Tuvo problemas con la lactancia materna?
19. ¿Con que alimento a su bebe en los primeros tres días? ¿Agua, fórmula, medicina, hierbas?

Sondeo: ¿Alguien sugirió que usted debe alimentar al niño con algo más?

Sección 3: Primeros seis meses:

Vamos a seguir adelante y pasar a la primera semana y meses de la vida de su bebé.

20. ¿Experimentó alguna dificultad para darle pecho a su bebé durante este período?
    a. ¿Qué dificultades experimento?
    b. ¿Qué hizo para resolver el problema?
21. ¿Cuándo alimentó a su hijo?

    Sondeo: ¿bajo demanda? ¿En un horario? ¿Pacha por el día y pecho por la noche?
22. ¿Alguna vez se sintió como que no pudo darle pecho a su bebe?
    a. ¿Puede hablar de lo que pasó?
23. ¿Qué le dio a su bebé durante los primeros seis meses, además de la leche materna?
    a. ¿Cuándo le dio agua a su bebé? ¿Otros líquidos?
    b. ¿Cuándo le dio medicamento?
    c. ¿Introdujo otro tipo de leche o formula (leche de bote o leche de tarro) durante los primeros 6 meses?

       Sonda: ¿Se sintió que había beneficios al usar esta otra leche o formula?
24. ¿Uso un extractor de leche o bomba de pecho durante los primeros seis meses?
25. ¿Cuál fue la primera comida que le dio a su bebé?
    a. ¿Qué alimentos adicionales introdujo en ese momento?
    b. ¿Cambio como le da pecho al bebe después de que el/ella empezó a comer comidas solidas?

Sección 4: Lactancia durante la enfermedad:

26. ¿Ha estado enferma durante el tiempo que le ha dado pecho a su bebe?
    a. ¿Cambió como le da pecho a (nombre del bebé) cuando usted estaba enferma?
27. ¿(Nombre del bebé) ha estado severamente enfermo con diarrea?
    a. ¿Afectó como comía él bebe?
28. ¿(Nombre del bebé) ha estado gravemente enfermo con alguna enfermedad respiratoria?
    a. ¿Afectó como comía él bebe?

<u>Esta sección es sólo para madres que actualmente están amamantando:</u>

Sección 5: Madres que actualmente están amamantando:

29. ¿Cuántas veces al día le da pecho a su bebe?

Sondeo: ¿A petición o en un horario? ¿Qué pasa por la noche?

30. ¿Qué hace cuando no tiene ganas de darle pecho a su bebe?

Sondeo: ¿Utiliza otros métodos?

Esta sección es sólo para madres que NO están amamantando:

Sección 6: Madres que no están amamantando:

31. ¿Cuándo dejó de dar pecho? ¿Por qué?

Esta sección es sólo para madres que usan formula (leche de bote, leche de torro, pacha)

Sección 7: Madres que usan formula y no amamantan:

32. ¿Por qué usa formula?
33. ¿Qué tipo de formula usa?
34. ¿Que hiciera en el caso que no hubiera suficiente formula?

Sondeo: ¿Como y cuanto diluye la formula?

Esta sección es sólo para madres que no usan formula (leche de bote, leche de torro, pacha):

Sección 8: Madres que NO usan formula (leche de bote, leche de torro, pacha)

35. ¿Por qué no usa formula?

Sección 9: Conocimiento de la lactancia materna:

36. ¿Conoce la frase "lactancia materna exclusiva"? ¿Qué significa esta frase para usted?
37. ¿Qué cree que es más nutritivo para un bebe, la leche de bote (leche de tarro o pacha) o la leche de pecho? ¿Por qué?

Sección 10: Actitudes en la lactancia materna:

38. ¿Qué le pasa a un bebe si la mama decide solo darle pecho (sin nada más) durante los primeros seis meses de su vida?

    Sondeo: ¿Tiene resultados positivos o negativos? ¿Ejemplos? Cuesta menos, es mejor para el futuro, hay beneficios para el bebé y la mamá.

39. ¿Por qué cree que algunas mujeres de su comunidad pueden optar por darle pecho a su bebe?

Sondeo: La fórmula es mejor / más nutritiva, le duele a la madre solo amamantar, la madre no tiene una buena dieta

40. Digamos que usted no puede estar en casa para darle pecho a su bebé por alguna razón, ¿estaría bien que otra mujer le de pecho su bebé?
    a. ¿Hay alguien a quien usted prefiera que le de pecho a su bebé?
41. ¿Es diferente la duración de la lactancia materna para niñas y niños?
42. ¿Cuándo cree que una mama debe de dejar de darle pecho a su bebe?

Sondeo: ¿Cuándo la madre está enferma? ¿Cuándo empieza a trabajar? ¿Cuándo el bebé pierde interés? ¿A un año?

Sección 11: Normas subjetivas en la lactancia materna:

43. Si tiene pareja, ¿le apoya en la lactancia materna?
44. ¿Qué tipo de apoyo recibió de su familia u otras personas con respecto a la lactancia materna?

    Sondeo: ¿Cual es la relación de ella con otras personas en la casa? ¿Cuáles son sus responsabilidades en la casa? ¿Como divide las responsabilidades con las otras mujeres/personas?

Sección 12: Control percibido de la lactancia materna:

45. Para que le pueda dar pecho a su bebe sin problema, ¿cuales son los beneficios que piensa que son necesarios para usted?

Sondeo: ¿Apoyo social? ¿Más comida para ella?

46. ¿Qué factores le complican la habilidad de dar pecho?

Sondeo: ¿Tiempo, privacidad, pezones doloridos o agrietados?

Sección 13: Preguntas de cierre:

47. ¿Quién es la mejor persona para hablar si tiene alguna pregunta sobre la lactancia materna?

Sondeo: ¿Qué tipo de consejos ofrecen?

48. ¿Cómo le gustaría recibir información sobre la salud de los niños y bebés, con respecto a la alimentación infantil?

Sondeo: ¿Medios de comunicación, miembros de la familia, trabajadores comunitarios de salud?

49. ¿Qué consejo le daría a una nueva madre sobre la lactancia materna?
50. ¿Hay algo más relacionado con la lactancia que usted desee discutir?

Muchas gracias por tomarse el tiempo de su día para llevar a cabo esta entrevista. Espero que haya tenido una buena experiencia durante la entrevista.

Appendix B: Codebook

Code	Defnition	Clarifying Notes
Exclusive Breastfeeding	The mother discussing any perceptions or practices regarding exclusive breastfeeding; both positive and negative.	Includes: (1) The practice does not have to be continuous for six months, segments can include discussion about having it used for any period of time. (2) May also include past behavior. Excludes: (1) Does not encompass feeding the infant herbs, water, foods, other substances, etc.
Support	The mother discussing (1) physical, (2) emotional, and/or (3) financial support from any individual(s) or organization(s).	Includes: (1) Exclusive and none-exclusive breastfeeding practices.
Family and Partner's Support	The mother receiving direct or indirect support from her significant other/partner and family members regarding breastfeeding.	Includes: (1) Partner can be a spouse, boyfriend, significant other, etc. The participant and the partner do not have to live together or be in an exclusive relationship. (2) Family members include immediate family as well as extended family members (aunts, uncles, grandmother, etc.)
Intention	The mother discussing her plans or intentions on feeding her child prior to the infant being born.	Inludes: (1) Exclusive breastfeeding, (2) Breastfeeding, (3) Formula feeding, (4) Solid foods, (5) Any substances.
Advice	Mothers receiving any advice and recommendations from any individuals or organizations about her health or her infant's health.	Includes: (1) Any health worker: Doctors, nutritionists, community health workers, etc. Excludes: (1) Advice or recommendations about the mother's health that does not directly tie to the child's nutrition.

Health Worker's Advice	Mothers receiving both good and bad advice and recommendations from health workers about nutrition and how to take care of their children.	
Substances and Food	The infant being fed any substances/food other than breast milk and formula.	Examples: Herbs, soup, medicine, etc.
Formula	Any discussion regarding formula or perceptions of formula.	Includes: (1) Both using and not using formula.
Mother's Diet	Discussion about the mother's food consumption, while pregnant, breastfeeding, or up to the child's first year of life.	
La Chureca	Any discussion regarding La Chureca. May include the description of the place or experiences with working there.	Definition: The municipal trash dump located in Villa Guadalupe. Includes: (1) Past and present experiences.
Tibio (Nicaraguan Drink)	Whenever the participant brings up drinking *tibio* in order to help her breastfeed.	Definition: A warm drink made of ground, toasted cornmeal and other spices such as cinnamon and cocoa. This drink forms part of the Nicaraguan identity.
Low Resources	The participant discussing financial hardship.	
Information	The participant discussing her preferred method of receiving information regarding breastfeeding and her infant's nutrition.	

Appendix C: Villa Guadalupe Participant Sociodemographic Information

Villa Guadalupe Participant Sociodemographic Data														
Participant Pseudonym	**Age**	**Education Level**	**Employed**	**Occupation/ Job**	**Civil Status**	**Live with Partner**	**Partner Employed**	**Partner's Occupatin/Job**	**# Children**	**# People in The Household**	**Head of household**	**Monthly Salary**	**Monthly Spending on Formula**	**Age of Child being Breastfed**
Elena	28	Secondary	Yes	Vendor	Married	Yes	Yes	Recycling	3	6	Partner	$6,000	$0	4 Months
Fernanda	17	Secondary	No	N/A	Partnered	Yes	Yes	Vendor	1	6	Father-in-law	$6,000	$520	3 Months
Madonna	21	Primary	No	N/A	Partnered	Yes	Yes	Fisher	3	5	Partner	$1,000	$1,000	9 Months
Bianca	16	Secondary	No	N/A	Partnered	Yes	Yes	Fisher	1	8	Father-in-law	$0	$520	4 Months
Marisol	27	Secondary	Yes	Vendor	Partnered	Yes	Yes	Vendor	3	9	Interviewee	$5,000	$970	9 Months
Carmen	25	Primary	Yes	Vendor	Single	N/A	N/A	N/A	1	4	Interviewee	$1,000	$600	11 Months
Carolina	41	Primary	No	N/A	Single	N/A	N/A	N/A	7		Interviewee	$0	$0	28 days
Kenya	24	Secondary	No	N/A	Partnered	Yes	Yes	Vendor	2	9	Mother-in-law	$2,000	$520	2 Months
Ana	20	Secondary	No	N/A	Partnered	Yes	Yes	N/A	2	9		$3,500	$0	11 Days
Cristina	21	Primary	No	N/A	Partnered	Yes	No	N/A	2	13	Brother-in-law	$1,500	$0	14 days
Francis	16	Primary	No	N/A	Partnered	Yes	Yes	Recycling	2	6	Mother	$3,000	$0	6 days
Maria	29	Secondary	No	N/A	Married	Yes	Yes	Vendor	2	6	Husband	$5,000	$120	4 Months
Jessica	28	Secondary	Yes	Recycling	Single	N/A	N/A	N/A	3	5	Interviewee	$6,000	$120	9 Months
Karen	32	Secondary	No	N/A	Married	Yes	Yes	Technician	3	5	Husband	$3,000	$0	12 Months
Paola	16	Primary	No	N/A	Partnered		Yes	Vendor	1	11	Mother-in-law	$0	$360	1 Month
Marcela	17	University	No	N/A	Partnered	Yes	Yes	Market Supervis	2	10	Partner	$8,000	$600	6 Months
Angie	21	Secondary	No	N/A	Married	Yes	Yes	Recycling	1	11	Father-in-law	$6,300	$720	9 Months
Tina	28	Secondary	Yes	Recycling	Single	N/A	N/A	N/A	3	6	Interviewee	$6,000	$1,040	4 Months
Andrea	19	Primary	No	N/A	Partnered	Yes	Yes	Recycling	2	12	Mother	$3,000	$400	1 month
Janet	29	Secondary	No	N/A	Single	N/A	N/A	N/A	2	13	Friend	$0	$370	1 Month
Average	23.75								2.3	8.105263158		$3,315		4 Months