Cultural Model of Infant Feeding Among Women in Rural and Urban Bangladesh

Rumana Rahman

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Cultural model of infant feeding among women in
rural and urban Bangladesh

By
Rumana Rahman

A Thesis
Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Master of Arts
in Applied Anthropology
in the Department of Anthropology and Middle Eastern Cultures

Mississippi State, Mississippi
August 2017
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Rumana Rahman

2017
Cultural model of infant feeding among women in rural and urban Bangladesh

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Cultural practices influence infant feeding choices and have a significant impact on children’s physiological growth and cognitive development. This study examined cultural knowledge of infant feeding among women in rural and urban Bangladesh. The findings of this research indicated that there was sufficient agreement among the respondents to constitute a single shared cultural model of infant feeding among participants in Bangladesh. Results also indicated intracultural variation within this model in terms of duration of exclusive breastfeeding, age at introduction of water, and weaning practices. Better understanding infant feeding can inform future programs aimed at improving early nutrition, growth, and development by providing information about actual practices and their cultural importance.
DEDICATION

This research is dedicated to all the women and children living in slums of Mohammadpur district in Dhaka, Bangladesh and in the village of Maijbaria in the Feni district of Bangladesh. I am sincerely grateful for the way they welcomed me in their community, shared their stories and for their acts of compassion in the face of adversity that they face every day.
ACKNOWLEDGEMENTS

I owe many people gratitude without whom this project would have never been completed. First and foremost, my major professor, mentor and friend, Toni Copeland. Malala Yousafzai, Pakistani education activist and the youngest person to be awarded a Nobel Prize referring to teachers stated, “One child, one teacher, one book, one pen can change the world.” Toni has been the embodiment for me as the example of a teacher who strives to make positive change in the world every day. Toni’s work with HIV positive women in Kenya has been an inspiration for my own with vulnerable populations in Bangladesh. I am sincerely grateful for her encouragement, support, guidance and patience throughout my graduate career. Tazin Shadid, my friend and mentor who works tirelessly so that children in the slums of Dhaka can dream of a better future. My fieldwork in Bangladesh would have not be possible without his support and encouragement. My parents for supporting me throughout this journey and believing in me. Lastly, I would like thank my friends, co-workers and my graduate cohort at Mississippi State University for listening to me, advising me and pushing me when I needed it.
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CHAPTER I
INTRODUCTION

Approximately fifty percent of the six million deaths of children under five are related to malnutrition either directly or indirectly (UNICEF 2017). Undernutrition also makes children under five more susceptible to dying from common infections, delays recovery, results in poor cognitive ability and poor performance in school (UNICEF 2017).

Children who survive malnutrition in their early years often face cognitive and growth impairments, making them more susceptible to diseases throughout their lives. Malnutrition rates in Bangladesh are some of the highest in the world (UNICEF 2016). Short-term food deficiency and chronic malnutrition among children is evident in high prevalence of low weight for age (underweight), and high levels of stunting (height for age) (UNICEF 2016). Previous studies in Bangladesh have shown that when infants transition from breastmilk to solid food during their second year, the risk of malnutrition increases sharply (Deolaliker 2005, UNICEF 2016).

Malnutrition in Bangladesh varies by gender, birth order, region, and economic factors, demonstrating that it is a complex phenomenon connected to sociocultural and political-economic factors (Deolaliker 2005). Even though socio-economic status is a strong predictor of malnutrition among infants, a child nutrition survey conducted by the government of Bangladesh in 2000 reports that among the wealthiest 20 percent, one
third of the children suffer from malnutrition, indicating that factors other than economic constraints may be contributing to this phenomenon in Bangladesh (Deolalikar 2005).

The research presented here examined infant nutrition and feeding practices, including breast-feeding behaviors, among urban and rural mothers in Bangladesh to understand how social, cultural, and economic differences both between and within these groups influence infant feeding patterns. The specific aims of this project were to examine the variation in 1) infant nutrition, 2) feeding, and 3) the duration and frequency of breastfeeding between rural and urban mothers in Bangladesh. Cultural beliefs and practices regarding prelacteal, complementary feeding, transitional feeding, as well as breastfeeding were examined to understand intracultural variability. The urban sample in this study was comprised of poverty stricken mothers in Dhaka, the majority of whom are migrants from rural areas. An examination of the shared knowledge regarding infant feeding practices of urban and rural mothers also demonstrated how infant feeding and child care practices are impacted by migration. A cultural model of infant nutrition provided insight for a better understanding of shared knowledge regarding the duration and frequency of breastfeeding.

It was hypothesized that: 1) there is a single shared cultural model of infant feeding among women in rural and urban Bangladesh, which includes frequency and duration of breastfeeding, and 2) knowledge of this cultural model of infant feeding varies between rural and urban mothers. Qualitative and quantitative data were collected through structured and semi-structured interviews with women who either had an infant or had raised an infant. A cultural model of good nutrition was explored through cultural domain analysis to understand the shared knowledge regarding infant nutrition and
feeding practices and to examine intracultural variability in this model. Participant observation was conducted to collect qualitative data on infant feeding and nutrition. Data was collected during the summer of 2010 from urban slums located in the Mohammadpur locality in Dhaka, the capital city of Bangladesh, which has a population of 13 million (UNICEF 2008) and a rural village in the Feni district while participating in an internship with a local non-governmental organization (NGO) involved in maternal and child health.

Chapter two reviews the literature related to trends in malnutrition globally focusing on Bangladesh, infant feeding in terms of breastfeeding, complementary feeding, introduction to solid food, effects of rural to urban migration on malnutrition and also addresses the theoretical framework within cognitive anthropology that guided the theory of this research.

Chapter three covers the settings of capital city of Bangladesh, Dhaka and field site of Maijbaria village in Bangladesh which constituted of the rural and urban site for this project. This chapter also covers the theoretical framework of cultural consensus analysis and the methods of free listing, pile sorting and rating tasks in examining if there is single shared cultural model of infant feeding among women in Bangladesh and the degree intracultural variability within this model.

Chapter four presents a cultural model of infant feeding practices. Here, the sample is discussed through the presentation of demographic data. The terms of the model generated in freelistng and sorted in unconstrained pile sorts provide context for this specific model. Cultural consensus analysis from rating task results are explored to
address shared cultural knowledge and intracultural variability associated with rural and urban differences.

Chapter five explores qualitative data with a specific focus on internship experiences with the Urban Health Care Clinic (UHCC) in the urban site, rural fieldwork in the village of Maijbaria in the Feni district of Bangladesh, factors reported by women on leading causes of infant malnutrition, prelacteal feeding, breastfeeding methods, weaning, and the emic reasoning of introducing water before the six months of age. Qualitative analysis provides a more holistic perspective of the cultural model of infant feeding among women in rural and urban in the context of their rural and urban environments.

Chapter six discusses these results in the context of recent literature as well as the applied implications in terms of policy implications and interventions aimed at reducing malnutrition rates among children under five and also discusses the limitation of this project in terms of research design and data collection.
CHAPTER II
MALNUTRITION AND CHILDHOOD FEEDING PRACTICES

Introduction

Worldwide, three million children died before reaching the age of five in 2016, with South Asia and Sub-Saharan Africa having the highest rates of malnutrition globally (UNICEF 2016). Undernutrition is a significant determinant for most child deaths (Black et al. 2003). According to a recent UNICEF study between 1990 and 2015 rates of stunting have declined experienced a declining trend from 39.6 percent in 1990 to 23.2 percent in 2015 (UNICEF 2016). Even though rates of stunting have seen a decline trend between 1990 and 2015 it still has a significant impact in South Asia and Sub-Saharan Africa with two of every four children in South Asia and one out of every four children in Sub-Saharan Africa suffering from stunting (Black et al. 2013).

Infant feeding, nutrition, diet, access to health resources, and economic status are complexly interlinked as determinants of malnutrition. What, when and how much children eat are also significantly shaped by cultural beliefs regarding infant feeding and nutrition and this, in turn, affects health, growth and nutritional status (Dettwyler 1995). From birth to two years of age is crucial in terms of growth and development of infants as development during this period influences health outcomes later in life. Hence, infant-feeding practices during this time have significant implications for future physical and cognitive development (UNICEF 2009).
Research in Bangladesh has shown that infants are most vulnerable to diseases and environmental contaminants when they first transition to solid food (Deolalikar 2005). Through analysis of epidemiological data, Pelletier et al. (1995) concluded that mild to moderate malnutrition is strongly related to child mortality in developing countries, and changes in feeding behavior can have significant impact on child mortality. Research addresses how malnutrition rates decrease with increasing economic status, maternal education, region, age, birth order and gender (Hobcraft 1993; Sandiford et al 1995; Chowdhury et al. 2000; Deolalikar 2005). However, there is a lack of research on the variation of mothers’ cultural knowledge regarding infant feeding, nutrition, and child nutritional status. However, Dettwyler (1992) examined the causes of child malnutrition in Mali and found that increasing income was not correlated with increasing quantity or quality of the child’s diet. She concluded that biological, social and cultural factors in addition to economic status are responsible for child malnutrition. An understanding of the variation in the shared knowledge of infant feeding and nutrition among rural and urban will help better identify how beliefs affect child health, nutrition status, and growth.

**Infant Malnutrition**

Child malnutrition is evaluated by height and weight for age as compared with international growth standards (UNICEF 2013). Stunting is defined as low height for age and is an indicator of chronic malnutrition, while wasting is defined as low weight for height and demonstrates effects of acute malnutrition, and underweight is a measure of low weight for age (UNICEF 2013). Malnutrition rates in Bangladesh are some of the highest in the world (UNICEF 2016). According to Food and Agricultural Organization
of the United Nations, approximately 9.5 million children in Bangladesh which constitutes of fifty-four of the total population of children under five suffer from stunting, while 56 percent of children under 5 are affected by underweight and 17 percent of children under five are affected by wasting which is an indicator of acute malnutrition (FAO 2016). UNICEF’s global nutrition database in 2011 Bangladesh ranked sixth globally in terms of the highest percentage suffering from stunting, fifth in rates of children affected by wasting, fourth in rates of low birth weight among infants (UNICEF 2012). A low birth weight can predispose children under five to issues related to malnutrition later in life (Rahman et al 2016). A study by Rahman et al. (2016) in Bangladesh found that children who were born with low birth weight were 47 percent more likely to suffer from underweight from birth to age of five.

Scholars have indicated that gender plays a significant factor in determining rates of malnutrition in Bangladesh with more female children malnourished than males (Henry et al. 1993, Choudhury et al. 2000, Deolalikar 2005). The type of malnutrition also seems to vary by gender. Deolalikar (2005) showed that female children suffer more moderate malnutrition, whereas severe malnutrition rates among male children are almost twice that of females. Dancer (2008) suggested that male children in Bangladesh have a lower likelihood of surviving the first year of life. Scholars have also asserted that malnutrition rates vary by a combination of birth order and gender; first born female infants have a higher probability of being malnourished, which indicates a cultural preference for male children (Deolalikar 2005; Dancer et al. 2008).

Malnutrition rates in Bangladesh also vary by region with children in rural areas suffering stunting and wasting more often than their urban counterparts (Rizvi 1980;
Deolalikar 2005). Research has suggested that a positive correlation exists between mother’s education and child health (Hobcraft 1991; Mensch 1985), but studies have rarely examined how infant nutrition and feeding practices vary with these indicators. Some researchers have suggested that the association between mother’s education and child health is not evidence of causality as maternal education is often demonstrated by controlling for social and economic variables like income and wealth (Hobcraft 1993). Sweson (1984) found positive correlations between growth rate, birth order, and previous fetal or infant death in Bangladesh. Researchers have also examined intra-household allocation of resources and, food buying capacity to explain the variation in malnutrition (Rizvi 1980; Dettwyler 1998).

Anthropologists studying determinants of malnutrition in Bangladesh have employed several theoretical frameworks. Rizvi’s (1980) study of malnutrition among rural and urban populations in Bangladesh examine the complex relationships between culture, environment and food use patterns to understand the causes of infant malnutrition. Rizvi’s (1980) study indicates that between the ages of six months to two years infant feeding practices are a stronger determinant of malnutrition than economic status.

**Breastfeeding and Complementary Feeding**

For more than 99 percent of human history, infants have obtained their nutrition primarily from breastfeeding (Dettwyler 1995). Duration of breastfeeding and complementary feeding have significant impact on malnutrition rates among children under five globally (UNICEF 2012). Cultural knowledge surrounding breast-feeding and childcare show great variation across and within cultures and can also go through quick,
dramatic shifts (Sellen 2001). WHO (1998) defines complementary food as, “The period during which other foods or liquids are provided along with breast milk. Any nutrient-containing food or liquids other than breast milk given to young children during the period of complementary feeding are defined as complementary foods.” Several anthropologists have used an evolutionary framework to explain variations in human lactation and complementary feeding behaviors (Dettwyler 1995; Hollman 2003; Sellen 2007). Sellen (2007) suggested that complementary feeding in humans coevolved with physiological and life history changes to minimize the period of exclusive breastfeeding and caused a reduction in the birth interval duration without causing infant or maternal mortality to rise. Our ancestral hunter gatherers most likely fed their infants when they cried, termed as on “demand feeding,” and continued this feeding pattern for a couple of years (Dettwyler 1995) based on evidence from historical, archeological, and bone morphology. Cultural beliefs and practices influence the frequency and the duration of breastfeeding, and the frequency impacts the quality and quantity of breast milk, while the duration impacts decisions like co-sleeping and has implications on the child’s emotional, physical and cognitive development as well as maternal health (Dettwyler 1995). Scholars have also suggested that frequency of breastfeeding significantly impacts milk composition, growth rates, and that quality of the breast milk varies by feeding and by day (Hamosh 1980; Quandt 1984). Cultural beliefs regarding breastfeeding can significantly influence the frequency and the duration of breastfeeding, which in turn impacts the nutritional status of the infant.

Exclusively breastfeeding, as defined by the World Health Organization (1991), is feeding the child only breast milk with the exception of drops and syrups (vitamins,
minerals and medicines). A majority of researchers agree that optimal infant feeding includes exclusive breastfeeding until four to six months of age with nutritionally adequate complementary food given along with breast milk until two years (Dettwyler 1995; Fewtrell et al 2007; UNICEF 2009). Studies show that practicing exclusive breastfeeding until the age four to six months can significantly lower child death by supplying the infant with the immune protection from the breast milk and also by reducing the exposure to environmental pathogens (Anderson 1991; De Zoysa 1991; Huffman 1991).

Only 39 percent of infants aged 0-5 months in developing countries are exclusively breastfed with the rates of exclusive breastfeeding in Bangladesh being 64 percent in 2011 (UNICEF 2016). Being exclusively breastfeed significantly reduces that chances of infant death from diarrhea and pneumonia which are two the highest causes of death among under 5 (UNICEF 2012). Several scholars studying childhood malnutrition reported low rates of exclusive breastfeeding in Bangladesh (Haider and Begum 1995; Giasuddin et al. 2003, Mihrshahi 2007). Research conducted in Matlab, Bangladesh demonstrated that the duration of unsupplemented breastfeeding was a stronger predictor of child survival as compared to the total duration of breastfeeding (Shahidullah 1994). Most studies indicate that rates of exclusive breastfeeding for four to six months are lower among urban working women (Dettwyler 1992). Maternal work status is associated with an increase in the economic status of the mother, but often also leads to a decrease in time spent on infant feeding and childcare hence the relationship between maternal work and malnutrition is not very clear. Studies have reported that mothers stated insufficient
milk as one of the primary reasons for terminating breastfeeding in Bangladesh (Huffman et al. 1980, Zeitlyn 1997).

Non-breast milk liquids given to the infant before he/she begins breastfeeding, known as prelacteals also play a significant role in shaping breastfeeding practices. Perez-Escamillia et al. (1996) examined the association between prelacteals and breastfeeding behavior in Honduras and found that milk based prelacteal and prelacteal water are negatively associated with exclusive breastfeeding and milk arrival. Several studies examining infant feeding have reported that giving prelacteals, in the form of sugar water or honey, as the infant’s first food is common practice in South Asia (Rahi 2006, Darmstadt 2006, Alam 2008). Research conducted in the urban slum of Dhaka, Bangladesh examining newborn care practices reported that prelacteal food given to infants consisted mainly of honey, sugar, water and mustard oil followed by breast milk (Moran et al. 2009). Breastfeeding duration and frequency can also differ by seasonal variation. A study of the breast-feeding patterns among rural women in Bangladesh that followed mothers longitudinally for 1.5 years suggested that a seasonal trend exists in suckling time, with breastfeeding reduced during the harvest time as women were involved in processing of the rice crop (Huffman 1980).

Rizvi (1980) suggested that if the information given to mothers on infant nutrition and feeding differs from their traditional knowledge they often follow the cultural practices. Recent research on the effect of peer counseling on exclusive breastfeeding in Bangladesh found that peer counseling significantly increased the rates of exclusive breast-feeding as compared to mother’s who did not receive any counseling (Haider and Begum 1995). Success of the peer-counseling program could be due to the fact that
women from Bangladesh are far more likely to listen and believe the information given to them by a member of their community as compared to a public health official and also the peer counselors and the mothers share a higher degree of knowledge regarding infant feeding practices than a public health official or a health worker.

**Infant Feeding and Nutrition**

Complementary feeding is defined as the transition from exclusive breastfeeding to the introduction of non-breast milk foods and liquids to meet the nutritional requirements of the infant (Dewey 2003). Early introduction of complementary food increases the chances of infection by exposing the child to environmental pathogens (Dettwyler 1998; Deolalikar 2005). Several studies using randomized sampling have suggested that postponing the introduction of complementary food until the infant is six months of age is highly beneficial for the infant as it reduces the probability of disease exposure, leads to higher consumption of breast-milk and also increases birth interval duration (Cohen et al. 1994; Cohen et al. 1995; Lutter 2000). Referencing Waterlow (1988) and Allen (1994), Brown states that, “The period of complementary is of particular concern in low-income countries because it is often accompanied by considerable growth faltering with respect to international reference data” (Brown 1997, 139). Delaying the introduction of complementary solid food and liquids till the age of four to six months ensures the transfer of the nutritional and immunological advantages of breast milk and also significantly lowers the risks associated with environmental contaminants (Anderson 1991; De Zoysa 1991; Huffman 1991). Foods such as juices, cereal-based beverages and formulas lower the consumption of breast milk by infants, which in turn is negatively associated with nutrition and growth status (Dettwyler 1998).
The decision to feed solid food is influenced by a wide array of factors such as cultural beliefs regarding child, food, health, diet, environment, cuisine, maternal perception of infant nutritional requirement, and is also shaped by opinions of medical professionals, friends, and family (Dettwyler, 1992). Research in the biomedical field suggests that an infant should be fed solid food not before four to six months of age (AAP 1980; Foman 1984; Ernst 1990). Scholars studying the correlation between infant feeding practices and growth rates state that infant feeding practices often leads to good nutrition, but can also result in malnutrition (Bledsoe 1988; Dettwyler 1991; Hull 1985; Rizvi 1980; Thompson 1986).

**Rural to Urban Migrants**

Research from developing countries exhibits strong evidence that rates of poverty and malnutrition in urban areas are surpassing that of corresponding rural areas (Haddad et al. 1999). Several scholars have argued that poverty and malnutrition are shifting from rural to urban areas (Haddad 1999). A high percentage of the urban poor in developing countries reside in slums that are characterized by lack of safe drinking water, unhygienic conditions (absence of garbage disposal), and open sewers conditions, these factors result in higher rates of child malnutrition, morbidity, and diarrhea in urban slums as compared to areas associated with higher socioeconomic status or corresponding rural areas (Brockerhoff & Brennan 1998; Tim & Lush 1995). Examining the relationship between socioeconomic status and stunting in rural and urban areas of eight developing nations that represent two-thirds of the developing world’s population, Haddad et al. (1999) found that, in the majority of the countries, urban poverty and childhood malnutrition were increasing at greater rates in urban areas than in rural settings. Even though urban
areas in developing nations report better health facilities overall, economic status and clean living conditions are not always accessible by rural to urban migrants due to poverty (Omariba et al. 2010).

Several scholars have postulated that poor quality housing, lack of access to safe drinking water and unhygienic conditions associated with migrants’ living conditions in urban areas may be significantly contributing to lower rates of child survival (Brockerhoff 1995; Islam & Azad 2008). Brockerhoff (1995) examined the relationship between migration with child survival in Bolivia, Ecuador, Mexico, and Peru. He found that lack of access to safe drinking water, hygienic toilets, and open sewage were better predictors of child survival rates than were education, or time in urban location (Brockerhoff 1995). Lush (1995) also came to similar conclusions and postulated that the quality of the migrant’s physical environment with reference to services like access to clean drinking water and provision of in house toilets is able to better explain the variance observed in child diarrhea and mortality rates than socioeconomic status (Lush 1995). Examining the rates of child mortality in urban areas among children of migrants in 15 countries of Latin America, North Africa, and Sub-Saharan Africa, Brockerhoff (1995) found that children of rural migrants experience lower rates of child survival than children of urban natives.

Some scholars assert that the process of migration itself can act as a disruptive agent to child survival (Brockerhoff 1995; Omariba et al. 2010; Piperate 2004; Ssengonzi et al. 2002). Migration can lead to loss of mothers’ support networks that provided her advice and support on child feeding and rearing issues (Ssengonzi et al. 2002), resulting in early terminating of breastfeeding and early introduction of non-breast milk food,
which in turn increases the child’s exposure to pathogens and environmental contaminants (Manda 1999).

Migration to urban areas also results in the mother and infant residing in a vastly different physical environment than their former rural residences. Citing Ruel et al. (1999), Piperata et al. (2004, 396) state that migrants to urban areas experience, “qualitative and quantitative changes in diet, a decrease in the level of physical activity, a greater dependence on a cash income for access to food and non-food items, greater availability of health care and public services, weaker informal safety nets, increased participation of women in the workforce, and increased exposure to environmental contaminants, and the stress and violence that accompany high population densities” (Ruel et al. 1999). The changes brought about by this new physical environment can affect infant feeding practices and child rearing. Rural to urban migrants experience the double burden of suffering from infectious diseases linked to rural residence and they also suffer from chronic illnesses associated with urban residence (Habitat 2001).

The urban population of Bangladesh grew approximately nine times to 22 million during the period of 1961-1991 (Islam & Azad 2008) and rural to urban migration is estimated to account for as much as three-fifths to two thirds of this urban growth (United Nations 1993). In the capital city of Dhaka, migrants constitute of the vast majority of the urban poor (Center for Urban Studies 1990). By 2025 it is expected that 50 percent of the Bangladesh’s population will live in urban centers (World Bank 1999). This high rate of rural to urban migration is evident in the increasingly crowded slums where most poor migrants reside (Afsar 2000). Research examining the childhood mortality rates in rural and urban areas in Bangladesh indicates that even though childhood mortality rates are
higher in the rural areas, the rural-urban gap in childhood mortality is reducing significantly (Islam & Azad 2008). Rural to urban migrants in Bangladesh have a higher probability of living in a residence that lacks services such as electricity, safe drinking water, and a flushing toilet (Islam & Azad 2008). Examining child mortality rates among rural migrants and urban natives in Bangladesh, Islam et al. (2008) found that within the urban areas the mortality rates that are 1.6 times higher than the mortality rates among urban natives, and the difference between child survival among migrants and urban natives is more pronounced for recent migrants. They concluded that in terms of child survival urban migrants are at a disadvantage (Islam & Azad 2008).

In this present study, a rural to urban migrant is someone who has moved from their rural residence to the city, has been in the city for at least three months, and does not plan to move back to their rural residence. The majority of the urban sample of this study is composed of poverty stricken mothers residing in slums who are rural to urban migrants. An examination of the shared knowledge of infant feeding practices among rural migrants will help to understand the impact of rural to urban migration on these infant feeding practices.

**Cognitive Anthropological Theory and Methods**

Anthropologists view culture as set of values and beliefs that are learned and shared among individuals belonging to a particular group (Weller 2007). Cognitive anthropology examines the relationship between knowledge and culture. It investigates how cultural knowledge is distributed and organized among individuals. It assumes that individuals perceive and organize behavioral and material phenomenon distinctively, that this knowledge is shared, and unevenly distributed (Goodenough 1956). Cultural
consensus arises from the sharing of the cultural knowledge among individuals (D’Andradre 1984). Cultural Consensus modeling was developed by Romney et al. (1986) to quantitatively measure culture knowledge in a particular domain. Consensus modeling provides the researcher with the ability to explore intracultural variation among participants in the sample by providing individual knowledge scores for each participant (Romney et al. 1986). Culture consensus modelling investigates how the elements of a cultural model are distributed. It measures the shared knowledge of individuals in the model (Weller 2007). The degree of sharing between respondent pairs is estimating the proportion of identical answer between the pairs (Weller 2007). Cultural consensus analysis, which is a special case of factor analysis, loading on the first factor constitutes shared cultural knowledge (Weller 2007).

Cultural consensus modeling is based on a series of methods that is then analyzed to mathematically calculate if there is sufficient agreement among participates to constitute a single, shared cultural model. This analysis also assesses the degree of knowledge of each respondent. Cultural consensus modeling has three assumptions: 1) that each individual respondent should answer the question independently without the influence of any other respondent; 2) all questions should come from the same cultural domain, or topic and have the same level of complexity; and, 3) in order to apply the cultural consensus method there has to be a high degree of sharing or agreement among the respondents (Weller 2007). This is indicated by the Eigenvalues obtained during factor analysis. An Eigenvalue ratio of the first to second factors of three or more indicates there is sufficient agreement among the respondents to constitute a single, shared cultural model.
The aim of cultural domain analysis is to examine how components of the domain are distributed and organized among the respondents (Borgatti 1994). Freelistings are used to allow participants to generate elements of the domain while pile sorts, ranking, and rating scales are instruments for understanding how the shared knowledge is organized (Bernard 2006). Cultural consensus analysis can also be used to identify the most knowledgeable members of the culture in the particular domain (Bernard 2006). Cultural consensus analysis was conducted to determine if there is sufficient consensus between the respondents in the domain to be characterized as a shared “cultural model.” Cultural consensus analysis also provides each individual knowledge score for the participants (Swora et al. 2000). Cultural consensus analysis investigates the culturally appropriate answers and measures how the knowledge is shared among individuals. The cultural consensus model formulates the culturally correct answer key. Each respondent’s answer is compared to the weighted answer key to measure their individual competence score (Weller 2007).

Many researchers have used this formal cognitive model to investigate if there is a cultural model and the degree of sharing among the individuals that form the cultural group. In a study examining woman’s conceptualization of what causes breast and cervical cancer Chavez et. al (1995) had respondents rank order potential causes of cancer. Magna, Burton and Ferriera (1995) used the model to investigate the perception of prestige in occupations. Using the techniques of cultural consensus model Dressler et al. (1997) demonstrated that those respondents who reported to have access to what they perceived as the “ideal” cultural model of social support also had lower blood pressure.
scores and lower depressive symptoms. Indicating that there may be physiological effects of how respondents relate to “ideal” cultural model of health.

In studying the determinants of the lack of exclusive breastfeeding in a periurban area of Mexico City, Guerro et al. (1999) used cultural consensus analysis to examine infant feeding choices, barriers to breastfeeding and the mother’s source of advice regarding infant feeding. The average level of shared knowledge between the mother regarding infant feeding choices was found to be sufficiently high to warrant a cultural model of infant feeding among the mothers. Consensus analysis revealed that child’s nutrition, health, growth, and hygiene were ranked highly by mothers when determining infant feeding options, while cost, comfort, and the opinion of the husband were ranked less important. The results of the study were used to develop a peer counseling program to promote exclusive breastfeeding that incorporated elements from the cultural model of infant feeding in the same community. A follow up report on the peer counseling program confirmed higher rates of exclusive breastfeeding among the mothers receiving peer counseling versus those mothers who were not enrolled in the peer counseling program (Guerro et al. 1999).

Conclusion

This project builds on this previous literature by examining recent trends in malnutrition globally concentrating on trends of malnutrition rates in Bangladesh the geographic area of focus for this project. Examination of the literature on infant feeding of children under five demonstrated that decisions like duration of exclusive breastfeeding, complementary feeding and introduction of solid food have significant impacts on infant’s physiological and cognitive development. Review of the literature on
infant feeding globally validated that cultural knowledge regarding infant feeding vary both between and within cultures. The academic literature on global patterns of rural to urban migration indicated that malnutrition rates are higher in urban areas as compared to rural areas. Issues of poverty associated with rural to urban migration are linked to malnutrition rates among children under five. Finally, this chapter also discussed the theoretical framework of cognitive anthropology and cultural consensus analysis to examine if there exists a single shared cultural model of infant feeding among women in rural and urban Bangladesh and demonstrate mathematically how this knowledge is distributed among the respondents.
CHAPTER III
SETTING AND METHODOLOGY

Setting

Before traveling to the field sites in Bangladesh, the Principal Investigator (PI) received approval from the Mississippi State University Institutional Review Board (IRB). Informed consent was written in English and then translated into Bengali by a translation service organization in Dhaka, Bangladesh. Research was conducted in the slums dwellings located in Mohammadpur in Dhaka, the capital of Bangladesh. Urban fieldwork was conducted at a NGO clinic, Distressed Children & Infant International (DCI), a 501(C)(3) non-profit organization registered in the United States that serves poverty stricken mothers and children in the urban city of Dhaka and in rural areas of Bangladesh by providing healthcare, education and income generating activities. Rural field work was conducted in Maijbaria, a village in the Feni district of Bangladesh by participating in an internship with the village branch of the NGO I worked for in the city. Qualitative and quantitative data was collected during the summer 2010.

Figures 3.1 and 3.2 are maps of Bangladesh and the specific areas where fieldwork occurred.
Figure 3.1  Map of Bangladesh

Figure 3.2  Field Site Locations
According to the Population and Housing Census Survey of Bangladesh in 2011, approximately 90 percent of the country’s population are Muslim, while Hinduism (the second largest religious group) comprises approximately nine percent of the population with other religious minority groups (e.g., Buddhists and Christians) constitute the remaining one percent (Bangladesh Bureau of Statistics 2011). The Hindu population in Bangladesh has experienced a decline since the historic partition of the region along Hindu and Muslim majority nations in 1947 following the fall of the British rule that resulted in formation of present day India and Pakistan which included Bangladesh formally known as East Pakistan (Guhathakurta 2012). In examining the declining trend in the Hindu population of Bangladesh as a proportion of the population since the formation of East Pakistan in 1947 to present day Bangladesh Barkat et al. (2009) found that the Hindu population went from more than 18 percent in 1961 to nine percent in 2001 while the percentages of Muslims increased during the same period. The communal tensions created during the partition of the region along religious lines along with persecution of the Hindu minorities by the Pakistani army during the liberation war of Bangladesh resulted in approximately 703 Hindu persons per day leaving Bangladesh between the periods of 1964 to 1971 (Singh 2003).

Dhaka, the capital of Bangladesh, is characterized by rapid rate of rural to urban migration (Hossain 2005). More than 20 percent of the total population of Bangladesh reside in the urban area and this figure is projected to increase by 68 million by 2015 (Pryer et al. 2003). Most of the slum settlements are located adjacent to lower and middle class housing (Pryer et al. 2003).
Most respondents lived in the slum dwellings called *jhupris* that are made up of tin, bamboo, straw and polythene. These materials do not provide adequate protection from the elements of the weather and residents are particularly vulnerable during the rainy season, the season the research was conducted. Patients often came to the clinic with their prescriptions and other paperwork completely wet from the monsoon rain. In most cases, more than five members of the household live in a single room usually the size of the typically room in the Rayarbajar slum was 10ft by 10 ft. Majority of the households did not have a kitchen and hence slum dwellers cook inside their single room or use a shared oven called *chula* that multiple households share (Hossain 2005). Most households have no access to the city sewerage system and use pit latrines (Hossain 2005). Most of the urban poor living in the slums are migrants from rural areas and migrate to the city due to river erosion, lack of income and available jobs in the city (Hossain 2005). Most the mothers residing in the slums work as domestic servants or as garment factory workers. Both these jobs lack day care facilities and the elder child is often left to take care of the infant while mother is away at work. Without the expectations of a few mothers most of the rural mothers did not work outside of their homes.

The NGO clinic served mainly poverty stricken mothers and their children in the *Rayarbajar* slum area in the Mohammad sub district in the capital city Dhaka. *Rayarbajar* slum area was selected as one of the field sites as it represents one of the largest slum settlements in Dhaka, Bangladesh. NGOs in Bangladesh have played a crucial role in providing basic services to the poor in both the rural and in the urban areas. In the 1970s and in the 1980s NGOs worked together with the government of Bangladesh
to provide services mainly in the area of healthcare and nutrition. In the 1990s there was a shift in funding by foreign donors to NGOs only for services in the healthcare and development sector (Mercer et al 2004). Rates of malnutrition among infants and children are very high in slums of Dhaka. A study assessing the rates of malnutrition in the slums of Dhaka found that 68.4 percent stunting, 31.2 percent wasting respectively (Pryer 2003).

Figure 3.3 Feni District, Bangladesh

Data from rural mothers was collected by conducting a month-long fieldwork in the village of Maijbaria in the Feni district which is located in the northern part of Bangladesh. Feni district belongs to the Chittagong administrative district of Bangladesh.
The researcher participated in an internship program in the village run by Distressed Children & Infant International (DCI) that provided educational assistance to poverty-stricken children who traditionally have a high rate of school dropout.

**Methods**

A cultural model of good nutrition was explored through cultural domain analysis to understand the shared knowledge regarding infant nutrition and feeding practices and to examine intracultural variability in this model. Participant observation was conducted to collect qualitative data on infant feeding and nutrition. Research participants in the urban area were selected through snowballing sampling. After initially interviewing women who visited the NGO clinic the researcher visited households of mothers who had an infant in the present or had raised an infant. Research participants in the rural area were selected through snowballing sampling by first visiting with mothers that visited the NGO office and then making house visits with two research assistants provided by the NGO. The researcher visited both Muslim and Hindu households in the village to examine infant feeding knowledge and practices.

Before traveling to the field sites in Bangladesh an IRB approval for the study was submitted by the researcher. Informed consent was written in English and then translated into Bengali by a translation service organization in Dhaka, Bangladesh. The IRB approval for this study was granted by Office of Research Compliance at the Mississippi State University.

Initially, to generate elements, or terms, in the cultural model of good nutrition, freelisting was conducted with mothers visiting the urban slum clinic in Dhaka,
Bangladesh. To generate the elements in the free listing exercise women were asked: what is required to keep an infant healthy and what constitutes of good nutrition for the infant. Quantitative and qualitative data regarding knowledge and practice of infant feeding was collected by conducting semi-structured interviews with mothers. The topics covered in the semi-structured interviews ranged from demographic data, knowledge and practices pertaining to breastfeeding, exclusive breastfeeding, complementary feeding and maternal nutrition. To examine cultural consensus pile sorting was conducted with both the rural and the urban sample. Pile sorting was conducted by having the elements of the cultural domain that were identified through free listing and semi-structured interviews on individual index cards. Mothers were then given these cards and asked to sort them in piles. Analysis of quantitative data in the form of t-tests, one way ANOVA and correlations was conducted using SPSS, statistical analysis software.

**Phase 1: Freelisting**

Freelisting is an emic methodological task that allows participants to generate a list of terms that have meaning in their lives within a specific domain. Freelisting allows for the elicitation of culturally relevant terms from an emic perspective. In this phase, participants were asked to please tell me: “What is required to keep an infant healthy?” and “What constitutes good nutrition for an infant?” Freelisting resulted in 29 terms that were used in later pile sorting and rating tasks interviews.

**Phase 2: Pile Sorts**

In order to ascertain the distinctive features within the four dimensions, individuals who did not participant in the free list phase were asked to perform a pile sort.
In the pile sort phase, unconstrained pile sorts were used. Unconstrained pile sorts are a methodological tool that allows the researcher to understand the features participants use to distinguish items in the domain. Pile sorts were used to create a proximity matrix, or a numerical representation of the similarities and differences between terms based on how they were grouped together.

The terms determined in free listing were written on three by five inch note cards. These cards were randomized and presented to all participants in the same order. The PI gave the cards to participants and asked them to sort the terms into as many piles as they want and in any way they want. The PI then asked why they sorted the piles the way they did. The results of this phase were analyzed with multi-dimensional scaling and hierarchical clustering.

**Phase 3: Rating Tasks**

In the rating task phase, the PI asked participants to rate the terms generated in free listing task along with additional terms during the semi-structured interviews into three categories namely important, very important and not important.

**Conclusion**

The methods used to assess this shared knowledge are CCA and qualitative assessment. CCA requires three research phases: freelist, pile sort, and rating tasks. Free listing was used to develop culturally salient terms. The terms that were most salient were used in the next two phases. In the pile sort phase, multi-dimensional scaling and hierarchical clustering were used to represent how the terms were grouped. Terms that are closer together were sorted in the same piles most often, while terms that are not near
one another were rarely sorted together. The rating task phase quantitatively assessed how the model is shared across that portion of the sample. Rating task results provided information on how extensive the knowledge was shared, individual competence scores of how well participants knew the model, and a culturally correct answer key. These results were used in further statistical analyses to better understand the model.

The data form the entire sample was used to investigate the cultural model of infant feeding practices in Bangladesh. Qualitative responses to the open-ended questions asked in every phase were used to better understand the salient dimensions that terms cannot show. MDS and hierarchical clustering presented visually the different salient groups within the pile sorts. The rating tasks phase delineated the cultural dimensions that presented enough sharing to say there was consensus. Using both qualitative assessment and cognitive anthropological methods, I investigated infant feeding practices among mothers in rural and urban areas of Bangladesh.
CHAPTER IV
CULTURAL DOMAIN ANALYSIS: A CULTURAL MODEL OF INFANT FEEDING AMONG RURAL AND URBAN WOMEN IN BANGLADESH

Introduction

This chapter explores the cultural model of infant feeding among women in rural and urban Bangladesh by exploring the cultural knowledge of mothers regarding breastfeeding, exclusive breastfeeding, introduction of water, colostrum feeding and complementary feeding. The chapter begins with a discussion of the descriptive statistics. Then, results of freelistng, pile sorting, and rating tasks are discussed to demonstrate evidence for a shared cultural model of infant feeding among rural and urban women in Bangladesh.

The Sample

The demographic data is presented for rural and urban women as well as the entire sample for comparison. The continuous variables age, husband's age, age of respondent at marriage, age of women at first birth, number of children, household size, household income (per person per month), and income per person per month are shown in Table 4.1 with mean, standard deviation (SD), and range. Respondents’ average age is 28 and ranges from 19 to 50. Their husbands’ ages range from 20 to 60 and average 12 years older than their wives. Women report their average age at marriage as 17 and at the birth of their first child as 19. The majority also report having children within the first two
years of marriage. Household size averages just over five and ranges from two to 11.

Household income in Bangladeshi Taka (BDT) averages 8824 per month, with rural women reporting higher incomes (10688) than their urban counterparts (6400). Due to the range of the number of people living in households, income is also presented per person in the household per month. Here, monthly income was divided by the number of people living in the household and averaged for the sample. Despite the difference in income for rural and urban women, when household size is considered, the variation is not as large because in addition to higher income, rural households tend to be larger.

Table 4.1 Continuous Demographic Variables for Women

<table>
<thead>
<tr>
<th>Variable</th>
<th>Rural (n=29)</th>
<th>Urban (n=38)</th>
<th>Total N = 67</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (Range)</td>
<td>SD</td>
<td>Mean (Range)</td>
</tr>
<tr>
<td>Age</td>
<td>30 (19-50)</td>
<td>7.8</td>
<td>25 (16-40)</td>
</tr>
<tr>
<td>Husband's Age</td>
<td>38 (25-60)</td>
<td>9.7</td>
<td>31 (20-50)</td>
</tr>
<tr>
<td>Age at Marriage</td>
<td>18 (14-23)</td>
<td>2.0</td>
<td>15 (12-17)</td>
</tr>
<tr>
<td>Age at First Birth</td>
<td>20 (15-27)</td>
<td>2.6</td>
<td>17 (15-19)</td>
</tr>
<tr>
<td>Children</td>
<td>3 (1-7)</td>
<td>1.3</td>
<td>2.3 (1-5)</td>
</tr>
<tr>
<td># in Household</td>
<td>5.8 (2-11)</td>
<td>7.8</td>
<td>4.8 (3-8)</td>
</tr>
<tr>
<td>Household Income (BDT per month)</td>
<td>10688 (3000-30000)</td>
<td>7980 (1500-15000)</td>
<td>1565</td>
</tr>
<tr>
<td>Income (per person per month)</td>
<td>2199 (993-3405)</td>
<td>2857 (1201-2555)</td>
<td>1030</td>
</tr>
</tbody>
</table>

* p<.05, ** p<.01

One-way ANOVA tested differences in means between rural and urban women.

Results indicate that there are significant differences in age (F=5.1, p=.03), age at marriage (F=36.7, p<0.00), age at the birth of first infant (F=17, p<0.00), husband’s age
(F=8, p=0.01), and household income (F=5.1, p=.03). Rural participants and their husbands were significantly older than urban women who participated in interviewing. Women in the city married and gave birth at younger ages than women in rural areas. In addition, household income for rural households is significantly higher. This may seem counterintuitive. However, it is due to the substantial number of migrant workers in the rural site who work in the Middle East and, as a result, send money to their families in the villages. Urban households were primarily earning money from work in the informal sector, which is less stable with lower wages. One-way ANOVA tests indicated that there are no significant differences in household size (F=3.6, p=.06). However, this difference is approaching significance. Also, when household size is considered, the difference in income between rural and urban households decreases. Despite this, rural participants report more than double the income per person per month than their urban counterparts.

Table 4.2 presents categorical demographic variables, work status and marital status.

Twenty-two percent of urban participants report working at the time of the study, compared to only eight percent in rural areas. Most the urban women work as domestic servants or in garment factories in the city, while there are many fewer opportunities for women to participate in wage work in rural villages. All participants report being married.
Table 4.2  Categorical Demographic Variables for Rural and Urban Women with Percentages

<table>
<thead>
<tr>
<th>Variable</th>
<th>Rural</th>
<th>Urban</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>100%</td>
<td>96%</td>
</tr>
<tr>
<td>Work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>92%</td>
<td>78%</td>
</tr>
<tr>
<td>Yes</td>
<td>8%</td>
<td>22%</td>
</tr>
</tbody>
</table>

**Infant Feeding Practices**

Participants were asked how long should infants should be breastfed and how long they should exclusively breastfeed, defined as feeding only breast milk with the exception vitamins, minerals and medicine in the form of drops or syrups. Women were also asked when children should start receiving water and if newborns should receive colostrum. Table 4.3 presents responses related to these infant feeding and care practices along with whether respondents differentiated breastfeeding duration for males and females and where mothers seek help when their babies are sick.
Table 4.3  Infant Feeding and Support Resources for Rural and Urban Women

<table>
<thead>
<tr>
<th>Variable</th>
<th>Rural (n=29)</th>
<th>Urban (n=38)</th>
<th>Total N = 67</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean (Range)</td>
<td>Mean (Range)</td>
<td>Mean</td>
</tr>
<tr>
<td></td>
<td>SD</td>
<td>SD</td>
<td></td>
</tr>
<tr>
<td>Breastfeed Duration (months)</td>
<td>28 (18-60)</td>
<td>30 (18-48)</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>6.9</td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td>Exclusive Breastfeed (months)</td>
<td>6 (2-12)</td>
<td>9 (5-24)</td>
<td>7**</td>
</tr>
<tr>
<td></td>
<td>1.9</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>Infant Given Water (months)</td>
<td>1.8 (1-6)</td>
<td>4 (.5-9)</td>
<td>2.2</td>
</tr>
<tr>
<td></td>
<td>1.9</td>
<td>2.2</td>
<td>2.7**</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Males &amp; Females Difference in Breastfeeding</th>
<th>Percentage Rural = 38</th>
<th>Percentage Urban = 15</th>
<th>N = 53</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>24%</td>
<td>7%</td>
<td>19</td>
</tr>
<tr>
<td>No</td>
<td>76%</td>
<td>93%</td>
<td>81</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Give Colostrum</th>
<th>Percentage Rural = 38</th>
<th>Percentage Urban = 15</th>
<th>N = 53</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>100%</td>
<td>93%</td>
<td>99</td>
</tr>
<tr>
<td>No</td>
<td>0%</td>
<td>7%</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mother Seek Help for Sick Infant</th>
<th>Percentage Rural = 38</th>
<th>Percentage Urban = 15</th>
<th>N = 53</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr. or Hospital</td>
<td>83%</td>
<td>91%</td>
<td>87</td>
</tr>
<tr>
<td>Elders</td>
<td>11%</td>
<td>0%</td>
<td>10</td>
</tr>
<tr>
<td>Family</td>
<td>6%</td>
<td>9%</td>
<td>16</td>
</tr>
</tbody>
</table>

* p<.05, ** p<.01

The average time of breastfeeding duration is 29 months. All 28 rural and 14 (of 15) urban mothers believe that colostrum should be given to infants. This is one area where moms almost universally agreed. Rural women say that infants should be exclusively breastfed between two and 12 months with an average of six months. Urban women report comparatively longer exclusive breastfeeding between five and 24 months, averaging nine months. There is also greater variability in the duration of exclusive breastfeeding in the urban sample as indicated by standard deviations and ranges.
Fifty-four percent of rural women stated that water should be introduced at 21 days with 86 percent answering before three months of age. In contrast, the majority of urban mothers believed water should be introduced later, but by 6-9 months. In general, women in rural areas introduce water earlier than those in urban areas. Furthermore, there is less variability in the answers of rural participants. For both rural and urban women, the introduction of water at 2.7 months falls well below reported exclusive breastfeeding duration of seven months, indicating that women are providing water to infants during this time.

Twenty-four percent of women in the rural village made a distinction between breastfeeding duration for males and females, while only seven percent of the urban sample did so. When probed regarding the reasoning of such a distinction, respondents mentioned it was customary for people belonging to the Muslim community in the village to stop breastfeeding males at 1.5-2 years while allowing females to continue breastfeeding until 2.5-3 years. In all the cases where women said that the duration of breastfeeding depends on gender, they reported that males are breastfed less time. It should be noted that I did not initially ask women specifically about differences in breastfeeding by gender. They offered the information in response to questions asking how long infants should be breastfed. Also, Hindu women in the village did not differentiate breastfeeding duration for boys and girls. Instead, they cited physiological indicators such as eruption of the first tooth or self-weaning as guiding factors in deciding how long infants should be breastfeed. When asked where mother should get help when an infant is sick, 83 percent of the rural respondents and 91 percent of urban sample stated doctor or hospital indicating a strong preference for seeking help with biomedical
healthcare practitioners when infant is sick. One-way ANOVA indicate a significant
difference in the duration of exclusive breastfeeding between rural and urban mothers (F
= 8.1, p < .006) and age at introduction of water (F=17, p<0.00).

Freelisting Results

Sixteen participants completed freelisting interviews in order to elicit culturally
meaningful terms in a cultural model of infant feeding in Bangladesh. Here, women were
asked, “What is required to keep an infant healthy?” and “What constitutes good nutrition
for an infant?” (see Appendix A for complete interview schedule). Table 4.4 represents
the terms that were generated by freelisting and participant observation.

| Table 4.4 Freelisting Terms with Percent Mentioned (bolded terms added by PI) |
|-----------------|----------------|-----------------|-----------------|-----------------|
| Apple           | 13            | Elders          | -               | Husband         | -               |
| Banana          | 19            | Eggs            | 31              | Lentil Soup     | 38              |
| Breastmilk      | 13            | Fish            | 6               | Mango           | 19              |
| Brother-in-law  | Food          | 63              | Midwife         | Sheba (caring/service) |
| Cleanliness     | 31            | Fruit           | 38              | Milk            | 50              |
| Dal             | -             | Grapes          | 6               | Money           | 6               |
| Doctor          | -             | Healer          | -               | Mother-in-law   | -               |
|                 |               | Nutrition       | 6               | Water           | 13              |
|                 |               |                 |                 |                 |                 |

Twenty terms were generated by freelisting (e.g., milk, breastmilk, vitamins,
fruits, vegetables, and nutrition). The nine terms highlighted in bold in Table 4.4 are
elements that were identified through participant observation and that the PI added to
those generated specifically in freelisting questions (e.g., midwife, elders, and many
The elements generated by freelisting along with the added terms (29) were included for later pile sorting to further elicit how the elements are distributed in the cultural model of good nutrition and for rating tasks to assess the degree of sharing of cultural knowledge in this particular domain.

The majority of the terms involve nutrition or supporters and resources required to keep infants healthy. Women frequently talked about vegetables, lentil soup (*khichuri*), fruits, milk and breastmilk as very important for infant health. Interestingly, water was only mentioned by two respondents, perhaps due to the small quantity of water given to infants relative to breast milk. Cleanliness and caring were also indicated by women as required elements in keeping an infant healthy. This may also reflect the desires of women who live in slums with poor sanitary conditions to have a cleaner environment. Social supporters such as mother-in-law, sister-in-law, brother-in-law, and husband were added because women often spoke about the importance of specific kin as sources of support and knowledge for infant feeding practices even though they did not mention these in response to specific interview questions. Including them in later rating tasks was the only way to test their importance for women in this sample.

**Pile Sort Results**

These 29 terms were randomized, written on 3 x 5 notecards, and presented to participants in the same order. Nineteen respondents, ten rural and nine urban, were asked to sort the terms in unconstrained pile sorts. Specifically, women were asked to sort the cards into as many piles as they wanted in any way they wished. The pile sorting task was sometimes challenging as respondents often asked if they were doing this correctly. When respondents probed for additional direction the researcher reassured them that
there is no predetermined order and they were to sort the cards however they wished. Pile sort results were analyzed in Anthropac for Multi-Dimensional Scaling (MDS), which results in a two-dimensional map representing how the elements were associated spatially by the respondents. Figure 4.1 is this representation (MDS) of the pile sorting results. Terms that were grouped together are clustered closer on the map, and similarly, terms that were frequently grouped in separate piles are mapped farther apart. The MDS analysis also generated a stress factor, which is the measure of how accurately it represents the piles created by respondents. A stress factor closer to zero represents a good statistical fit. The stress factor for pile sorting task was .10, which is within optimal range (i.e., .10 or below). Pile sort results were also analyzed for hierarchical clustering, which indicates the specific groupings of terms. These results are consistent with three groups of terms that were sorted together frequently by respondents and are 1) nutrition shown in the blue circle, 2) financial and healthcare resources shown in red, and 3) kin and supporters shown in green.

Technically, NGO was grouped with supporters, but was mapped separately from other clusters. This is, in part, due to the varied ways that women view NGOs. They sorted this term both with family supporters and with financial and healthcare resources. One of the fathers visiting the NGO clinic in the slum explained to me, “I come here whenever my daughter’s skin condition gets worse. Yes, there are free government hospitals but their lines are too long and you can never see anyone in time.” His daughter had a severe case of impetigo, a bacterial skin condition that can spread rapidly to other areas of the body if left untreated. During semi-structured interviews participants often mentioned NGOs as sources for helping women access food, healthcare and other
infant needs. This unique role of NGOs makes it distinct from the other terms that represent nutrition, kinship or healthcare resources.

Nutrition needed to keep an infant healthy includes lentil soup *khichuri*, vegetables, fish, food, rice eggs, and water. *Khichuri* is a type kind of lentil soup made with rice, lentils and vegetables and was the most frequently mentioned food item by women when asked which solid food are best for the infants. It also includes vitamin and breastmilk that were grouped closer to each other and various fruits (e.g., mango, apple, orange, grape, banana). Women often mentioned orange, apple and grapes together. These fruits are native to Bangladesh and their high price makes them out of reach of the respondents who were mainly low-income earning slum dwellers. Expensive fruits like apples, grapes, grapes were also perceived by mothers of having a superior nutritional value.

Financial and healthcare resources needed to keep infants healthy include healers, doctors, and medicine, representing healthcare services were clustered together. It also includes money, cleanliness, and caring. Interestingly midwife was clustered away for the terms representing healthcare services perhaps as women did not see the midwife once they were done with the birthing process or because they see them as separate from biomedical services. A high proportion of women interviewed gave birth at home with the help of the midwife also known as *Dai* perhaps it is due to this distinction between the home and healthcare service providers that midwives was clustered further apart from other healthcare services.

Kin, or people who provide support keeping infants healthy, include elders, husbands, mothers-in-law, sisters-in-law, and brothers-in-law. It also includes *sheba,*
meaning service and caring. The clustering of service with kin could indicate the kin groups help access service.
Figure 4.1  Multidimensional Scaling of Terms for Infant Feeding and Health
Rating Task Results

Fifteen respondents were given these same terms and were asked to rate each on its importance for keeping infants healthy. Specifically, women rated each of the 29 terms as unimportant (0), important (1), or very important (2) for infant health. The terms were presented to all respondents in the same order. The data collected was coded as a rectangular matrix and analyzed for cultural consensus analysis in Anthropac 4.98.

Cultural Consensus Analysis

Cultural consensus analysis was performed on the results of the rating tasks to determine if there is sufficient level of consensus or agreement among the respondents to constitute a single shared cultural model of infant feeding practices among rural and urban women in Bangladesh. The eigenvalue ratio of factor 1 to factor 2 was 3.8, which meets the threshold for a single shared cultural model of infant feeding. Average competence score was .56 with a standard deviation of .20 signifying intracultural variability within the model. Respondent reliability for the cultural model of infant feeding was .87.

Table 4.5 Consensus Analysis

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Eigenvalue ratio</th>
<th>Avg. Competence</th>
<th>Variability Explained (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infant Feeding</td>
<td>3.8</td>
<td>.56</td>
<td>68</td>
</tr>
</tbody>
</table>

Table 4.5 represents the results of the consensus analysis in the domain of infant feeding with eigenvalue ratio, average competence score and variance explained by the first factor. The eigenvalue of factor 1 has to be at least three times greater than factor 2.
to satisfy the requirement of a single shared cultural model (Munck et al 1990). The results of consensus analysis support the first hypothesis of this study that there is a single shared cultural model of infant feeding among rural and urban women in Bangladesh. Consensus analysis also provides a weighted culturally correct answer key which literally weights the answers of participants who better know the model over those who do not know it as well.

Table 4.6 Weighted Correct Answer Key

<table>
<thead>
<tr>
<th>Term</th>
<th>CCA Rating</th>
<th>Term</th>
<th>CCA Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleanliness</td>
<td>2</td>
<td>Fruit</td>
<td>1.74</td>
</tr>
<tr>
<td>Caring</td>
<td>2</td>
<td>Elders</td>
<td>1.69</td>
</tr>
<tr>
<td>Husband</td>
<td>2</td>
<td>Fish</td>
<td>1.64</td>
</tr>
<tr>
<td>Milk</td>
<td>2</td>
<td>Banana</td>
<td>1.63</td>
</tr>
<tr>
<td>Vegetable</td>
<td>1.95</td>
<td>Rice</td>
<td>1.61</td>
</tr>
<tr>
<td>Water</td>
<td>1.95</td>
<td>Dal</td>
<td>1.59</td>
</tr>
<tr>
<td>Money</td>
<td>1.94</td>
<td>Midwife</td>
<td>1.55</td>
</tr>
<tr>
<td>Foods</td>
<td>1.93</td>
<td>Mango</td>
<td>1.44</td>
</tr>
<tr>
<td>NGO</td>
<td>1.88</td>
<td>Grape</td>
<td>1.4</td>
</tr>
<tr>
<td>Lentil Soup (Khichuri)</td>
<td>1.86</td>
<td>Orange</td>
<td>1.23</td>
</tr>
<tr>
<td>Mom-in-law</td>
<td>1.85</td>
<td>Service</td>
<td>1.03</td>
</tr>
<tr>
<td>Medicine</td>
<td>1.81</td>
<td>Healer</td>
<td>0.91</td>
</tr>
<tr>
<td>Doctor</td>
<td>1.8</td>
<td>Brother-in-law</td>
<td>0.8</td>
</tr>
<tr>
<td>Dim</td>
<td>1.77</td>
<td>Sister-in-law</td>
<td>0.75</td>
</tr>
<tr>
<td>Vitamin</td>
<td>1.76</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.6 summarizes the estimated correct answer for each term in their ascending order of importance. Here, as with rating, zero represents unimportant, one is important, and two for is very important. The terms cleanliness, caring, husband and milk were rated highest. In the category of food, milk, vegetables, water and lentil soup or khichuri were
also rated very important. Healers, brothers-in-law and sisters-in-law were rated the least important for ensuring infants’ health.

**Intracultural Variation**

Figure 4.2 presents a two-dimensional representation of individual respondent’s competence scores. The X axis on the graph represents individual competence scores while the Y axis constitutes factor 2 scores for each respondent. The aggregation of the scores around the average competence score of .55 is further evidence of a single shared cultural model of infant feeding among rural and urban women in Bangladesh. Despite these indications of a single shared cultural model, results are also consistent with intracultural variation. Figure 4.2 shows participants by rural (green circle) or urban (grey diamond). Here, it is apparent that urban mothers’ competence ranges from relatively low at .30 to a high of .80 (\(\bar{x}=.61\)). Also, their factor 2 scores are high, ranging between .01 and .41 (\(\bar{x} = .20\)), especially compared to rural mothers’ factor 2 scores (-.67-.27, \(\bar{x} = -.25\)). Urban mothers have factor 2 scores significantly higher than rural participants (F=16, p<.002). In addition, rural mothers cluster at the high end of factor 1 scores with very low factor 2 scores. These results indicate that urban mothers have some knowledge in addition to the specific cultural knowledge they share with rural women (Dengah 2013).
Figure 4.2  Competence Scores for Rural and Urban Women with Factors 1 and 2

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Figures 4.3 and 4.4 are error bar plots of factor one and factor two scores for rural and urban women. Error bars use 90 percent confidence intervals due to the small sample sizes. These depict the differences in cultural knowledge by location. Urban women have significantly higher factor 2 scores, which indicates that they have some knowledge that rural mothers do not share. Therefore, in addition to the shared knowledge (i.e., competence), urban mothers share some knowledge with other urban women that they do not share with rural women.
Figure 4.3  Error bar plot of factor 1 consensus by rural or urban mothers.

Figure 4.4  Error bar plot of factor 2 consensus by rural or urban mothers.
Correlations further explored these differences. Education, age at marriage, and age of first born are all negatively correlated with competence in factor 1 (-.63, -.53, and -.66, respectively). Age at marriage, age at first birth, and age of husband are all negatively correlated with factor 2 scores (-.62, -.67, and -.70, respectively. In other words, women with more education who were older when they married and older when they gave birth to their first child have lower competence than those with less formal education who were younger when they married and had children. Also, women who were older when they married and first gave birth and whose husbands are younger have higher factor 2 scores.

Table 4.7 Correlations with competence factors 1 and 2

<table>
<thead>
<tr>
<th></th>
<th>Education</th>
<th>Age at Marriage</th>
<th>Age at 1st Birth</th>
<th>Husband’s Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competence (Factor 1)</td>
<td>-.63*</td>
<td>-.53*</td>
<td>-.66*</td>
<td>.08</td>
</tr>
<tr>
<td>Factor 2</td>
<td>-.21</td>
<td>-.62*</td>
<td>-.67*</td>
<td>-.70**</td>
</tr>
</tbody>
</table>

* p < .05,  ** p < .01

Despite these associations, results must be interpreted with caution. These analyses do not imply a cause and effect relationship, only correlations. It is possible that these differences (i.e., age at marriage, age at first birth, formal education, and husband’s age) are precisely the factors that impact cultural knowledge of infant feeding and care. However, it is also possible that these factors are associated with urban life and are only correlated with competence because they correlate with living in urban areas. In that case, living in the city would be impacting knowledge and also resulting in more education,
marrying at an older age, giving birth later, and younger husbands. The analyses presented here cannot differentiate between these possibilities.

**Conclusion**

Free listing and participant observation helped determine the elements in the domain of infant feeding while pile sorting results identified three hierarchical clusters significant in the model namely, nutrition, financial and healthcare resources, and kin and supporters. Consensus analysis of ratings task demonstrated that there is sufficient agreement among respondents to constitute a single shared cultural model of infant feeding among rural and urban women in Bangladesh. The standard deviation of .20 for the cultural consensus analysis indicates that even though there is evidence of a single shared model there is also intra cultural variability within the model.

This intracultural variability was demonstrated in the quantitative analysis in the difference between breastfeeding feeding duration, exclusive breastfeeding duration, age at introduction of water among the rural and urban population and variation in weaning practices among the Hindu and Muslim households discussed further in the qualitative analysis chapter.
CHAPTER V
QUALITATIVE: OBSERVATIONS ON INFANT FEEDING PRACTICES

Introduction

Semi-structured interviews and participant observation were conducted in the urban site of Dhaka and the rural location of Maijbaria village in the Feni District of Bangladesh. Women who participated in interviewing were asked open ended questions about factors that cause infant malnourishment making them vulnerable to diseases. They were also asked about breastfeeding methods, weaning, and solid foods that are best for infants. Rural women were asked about why infants needed water before six months of age because a high proportion of them cited providing water to their infants within three months of age. This chapter explores my experience interning at the NGO clinic through which I met the women in this study, women’s views on infant feeding practices, prelacteals, breastfeeding methods, introduction to water, solid food, weaning from breastmilk, and infant health.

Internship Experience with the Urban Health Care Clinic (UHCC) Clinic

Urban Health Care Clinic (UHCC) served residents of a slum dwelling in the Mohammadpur area. I worked with this NGO during fieldwork. The clinic was located in the slum and attempted to improve the lives of women there through education and offering various services. Figure 5.1 depicts this clinic. A normal day at the clinic is presented here to provide context for some of the discussion that follows in this chapter.
A Day in the City

I woke up early in the morning to avoid the morning commuter rush in catching the public bus going to the Mohammadpur area. Even though the buses were never on time, there were crowds waiting to make a mad rush to get on the bus when it did arrive. Missing the bus would have meant an hour or more wait for the next one. There were always more people waiting than the bus could hold. Women passengers usually avoided this rush and often remained behind. Initially, I followed their lead and did not join the crowds pushing, shoving, and weaving to try to get on the bus. After a week of being left behind and waiting for another chance, I decided to join the crazy race to attempt to get my body into the bus. This apparently earned me respect in the eyes of our regular bus driver who shared with me that he has never witnessed a woman “fight” with the men to get on the bus. As a sign of earned respect, or possibly because of some sense to protect the young woman who did not know better, he would offer me a seat on the crammed space next to the engine at the front of the bus. The bus was over-packed and it would
often take off with passengers hanging out the doors. It was summer in Dhaka which meant the packed, unairconditioned bus was always unbearably hot. I actually developed bad skin irritations due to the crowded conditions, but this gave me a deeper insight into how the environment of poverty burdens the body of the poor. Figure 5.2 shows some of these buses in Dhaka.

![Figure 5.2 Public buses in Dhaka](image)

Once I reached the bus station, I fought traffic on the busy street to catch a rickshaw, a three-wheeled bicycle that would take me to the clinic where I worked. Sounded simple enough, until I tried it. Traffic in Dhaka is nothing like the ordered streets of American cities. To cross, I had to either make a mad rush for the other side or wait for a crowd so large to cross that it brought traffic to a halt. Once, a Rickshaw driver found me still waiting to cross the street after half an hour. He parked his rickshaw on the side of the road and gave me lessons on techniques of crossing the street of Dhaka. Eventually, I developed the skills to navigate the city streets and found it easier to get back and forth to the clinic each day.
Once at the NGO, during my first two weeks, I was asked to make observations and assessment on needs of the mothers visiting the clinic. Initially, I spent most of the time in the waiting room with the patients who were mainly women and children living in the adjacent slum. I talked to them about why they came to the clinic, their lives, and the struggles they faced in keeping their infants healthy.

In the summer months, Dhaka experiences electric outages for eight to ten hours each day. Often, the clinic was without power and temperatures inside were uncomfortably hot, even hotter than the 90 degrees it was outside. At first, the women were skeptical of me as an unmarried, childless woman in her late twenties, but soon I developed a rapport with them and felt honored that they were comfortable enough to share their stories with me. They even shared tales of their struggles beyond infant care, which was challenging at times, because these included stories of domestic violence, feeling forced into marriage at a very young age, or being mistreated and abused while working as domestic servants and day laborers.

After observing and assessing the needs of women who visited the clinic, I was assigned to accompany the clinic’s social worker on home visits in the slum to better understand the needs of infants. This particular slum was built adjacent to a main sewage line with dwellings held up by bamboo slits. The streets were dirty and muddy, but were the conditions that slum dwellers dealt with daily. The social worker accompanying me was part of Dhaka’s middle class and would often not enter homes of the women we were visiting because she considered them unsanitary. She would sit outside while I entered women’s homes to check on them and their newborns. I later learned later that women appreciated me going into their homes as they often had visitors or benefactors
supporting the NGO clinic visit them who would not enter their homes due to the conditions. The slum was in a site surrounded by sewage water and trash, but the dwellings were often clean and I would sit on the floor mat to talk to the women. It actually took me by surprise how clean the inside of the slum dwellings were, and after visiting their homes it made sense to me why women rated cleanliness highly in the subsequent rating tasks. Figure 5.3 includes some images from the slum that I took during fieldwork.

![Figure 5.3](Images of the slum served by the NGO)

After my slum visits my internship responsibilities were to teach the NGO clinic social workers successful methods of communicating with the mothers and I was also often the translators between western visitors and women at the clinic. These women
befriended me and showed me compassion and hospitality by offering me food and tea, making sure I was hydrated in the intense heat, and offering me ointments to heal my skin as the eczema worsened in the summer heat. These women lived in abject poverty, yet they welcomed me, shared their lives, and even their scarce resources with me.

During my slum visits I would make house visits with women and infants who were patients of the clinic to understand their needs in terms of keeping their infant healthy and once I was done the clinic allowed me spent the rest of the day visiting women in the slum to conduct research examining infant feeding practices. My internship experience demonstrated the importance of conducting participant observation to gain a comprehensive understanding of the struggles of the poor without making assumptions that their behavior is due to lack of knowledge. Without visiting women where they live, I would not know that in spite (or perhaps because of) of living in an unsanitary environment, they value cleanliness. Figure 5.4 are some images of women and their homes.

![Figure 5.4](image)

Figure 5.4 Urban women and their homes
Rural Fieldwork in the Village of Maijbaria

While conducting fieldwork with rural women, I lived in the town of Feni in an apartment owned by a distant relative and took a three-wheel automatic rickshaw to get to the nearest village of Maijbaria. The trip took me roughly thirty minutes every morning which was an improvement over the hours I was often stuck in traffic in the city. The NGO I interned with in Dhaka had a local branch in the village. The NGO in the village worked mainly with poverty-stricken children, many of whom received sponsorships for school. The sponsors constituted of mainly Bangladeshi-Americans who funded the programs run by the NGO in the form of monthly donations to sponsor a child or a lump sum amount to fund logistics of the various programs conducted by the NGO.

My internship duties in the village consisted of visiting children in their homes and in the schools to understand their needs and obstacles in pursuing their education. In return, I was able to conduct research with women to understand the cultural model of infant feeding.

The NGO paired me with two teenage girls who took me to the homes of the children and later became my valuable research assistants even accompanying me the homes of women for my own research. The schools there are poorly funded and have very high teacher to student ratios. The free public school functioned so poorly that some of the parents transferred their children to the Muslim religious school called Madrasa. My autorickshaw driver explained, “I took my sons out of the government school and put them in the Madrasa. At least in the Madrasa a teacher attends to him and sometimes they even fed him.” In one of the classrooms, the teacher for more than an hour after I arrived. Poverty posed the main barrier for formal education for children.
Working in the village posed unique challenges compared to the city. Rural women often do not work outside of their homes, and must seek permission from elder males in order to leave the house. My first two weeks I was often stopped and questioned by elders about my purpose, what village my family belonged to, and many did not understand why I wanted to visit women. Fortunately, young women who acted as my research assistants knew the village well and introduced me to their families. After questioning me thoroughly, their families permitted them to assist me and even introduced me to several other women for my research. Often, when arriving at a home for the first time, I was asked to talk to the male head of the house. One village man said, “If you have anything important to discuss then talk to me. What’s the need to talk to my wife?!” Most, however, allowed me to talk to their wives after discussing it with me and my assistants.

My two assistants and I would leave the local office around 10:00 in the morning to visit the women. Field work in the village was during rainy season, which meant that dirt roads were muddy and sometimes completely flooded. Leeches were a problem, but I learned how to remove them without too much trouble. There was also the occasional cow that simply would not move out of the narrow village roads. My two assistants would try to convince me every time we came across a stubborn cow that I should try to push it out of the way, but being a city child most of my life I would take the longer path avoiding any cow obstacles. My assistants worked with children from the NGO, knew almost everyone in the village, and were well respected in the village. My association with them made it easier to meet both Hindu and Muslim women. They also patiently taught me about life in the village. Unlike the urban site, the village was home to a
sizeable Hindu community who had different weaning and infant feeding practices than their Muslim neighbors. Fieldwork in the village allowed me to observe and examine this intracultural variation that I would not have seen in the city. Figure 5.5 are some images of rainy season in rural Bangladesh.

![Rainy season in rural Bangladesh](image)

**Figure 5.5** Rainy season in rural Bangladesh

**Factors Leading to Infant Malnutrition**

Women were asked what factors cause malnourishment in infants or make them vulnerable to diseases to elicit their emic perspective of poor infant health. Unsanitary environment, lack of proper nutrition and lack of proper infant care were cited most frequently by women as reasons for malnourishment and disease vulnerability.

Local NGOs focus on educating women and children on the importance of maintaining a sanitary environment. NGO personnel often comment on the unsanitary conditions and the need to educate women to facilitate cleaner, and therefore healthier, homes. While interning at the NGO I was asked to conduct study of assessment knowledge about hygiene particularly related to proper technique of washing hands among the children in the Mohammadpur slum. To get a baseline of what proportion of children in the slums have knowledge of proper hand washing I visited the slum adjacent...
to the clinic and the first ten children I interviewed all knew why and how one should wash one’s hand. I inquired why despite knowing about the importance of washing hands do they not wash hands and the children attributed not being able to buy soap and having access to water as the main reasons they did not wash hand.

The responses from women in the semi-structured interview indicate that they strongly associate unsanitary conditions with poor infant health and their inability to provide the infant with a sanitary environment is not due to their negligence or lack of education, but rather their poverty-stricken situation is a barrier to raising their infant in a clean environment. The slum site in Dhaka where fieldwork was conducted was built on sewage lines. When the rainy season of Monsoon arrived, it led a to rise in sewage water level and the slum inhabitants including the children had to often walk through the dirty sewage water to get to their dwellings. While interning at the NGO clinic during monsoon patients would often arrive with wet prescription slips as most of their roofs are not water proof. When the water level remained high for days the NGO clinic that served the slum dwellers would experience an increase of infants arriving with various skin conditions associated with unsanitary living conditions. Many of the infants coming to the clinic also suffered from various respiratory conditions due to being exposed to materials from nearby building construction sites.

This association between unsanitary condition and the women is so strong that often the women themselves are considered unsanitary and people of higher social-economic status are often not comfortable sitting in places they sat and this was also why the NGO social worker was not comfortable going inside the slums visiting with the women. During a clinic visit by of a Bangladeshi-American patron to talk to the mothers,
I noticed how he nearly fainted in horror when he found his seven-year-old son sitting and playing on a chair patients use in the waiting room. He exclaimed, “Oh no! How long have you been sitting on that chair. Do you know how many diseases are on that chair?” After visiting with several women patients, he expressed a commonly held belief as he advised the doctor, “We need to teach them how to be clean.” Environmental conditions rather than lack of education regarding sanitation played a significant role in causing the children to be malnourished and susceptible to diseases.

**Prevalence of Prelacteal Feeding**

Any food given to infants before initiation of breastfeeding is known as a prelacteal. Introduction of prelacteal is a barrier to exclusive breastfeeding, as accordingly to World Health Organization’s definition of exclusive breastfeeding constitutes of feeding the infant solely breast-milk and excludes all other non-breast milk food including water. Commonly reported prelacteals in this study included honey, sugar water, and mustard oil.

Women mentioned social tradition and the belief that sweet tasting foods like honey and sugar water could lead to the infant having a sweet disposition as reasons for feeding the infant prelacteals. Interestingly often the same mothers who reported exclusively breastfeeding their infant up to six months also reported giving prelacteal to their infants with the first three days from birth. Women reported giving prelacteal in the amount of few drops or half a spoonful, perhaps it is due to this small amount of prelacteal women believed they were still exclusively breastfeeding their infants. One of the women living in the slum stated, “As soon as my baby was born we gave her a drop of honey in her mouth. We hoped for a child with a sweet disposition.”
Breastfeeding Methods

When discussing when an infant should be breastfed, mothers frequently cited the crying of infants as an indicator that the infant was hungry for breast-milk. Women in both urban and the rural settings practiced on demand feeding. The crying of the infant was their cue to feed the child. With regards to the duration of each session of breastfeeding majority of the women stated that infant should be breast fed in ten to fifteen minutes increments. A twenty-three-year-old mother living in the slum stated, “I breastfeed my baby whenever she cries out of hunger and every time I fed her for around ten to fifteen minutes or for however long she suckles. I would fed her the same way at night.”

Weaning

The village site had a large Hindu community which was not the case in urban sample. Due to the presence of the Hindu community I was able to examine how weaning practices varied between the Hindu and Muslim households. Muslim women cited Islamic customs that advised weaning the male infant from breast-milk by two years of age while females often continue until two and a half years. Twenty four percent of respondents in the rural site distinguished between breast feeding duration between male and female infant while only seven percent of respondents in the urban site distinguished between male and female infants. In comparison to the Muslim households, the Hindu households cited the child's self-weaning as the indicator to stop breastfeeding. The highest reported age of weaning was seven in one Hindu household. Women in both the rural and the urban field site stated applying bitter melon juice which has a displeasing taste to their breasts in order to encourage their infants to stop breastfeeding.
Solid Foods for the Infant

The rural sample reported introducing solid food around six months of age while the urban sample had higher average of introducing solid food at nine months of age. Muslim women in the rural sample reported introducing solid food around six months of age whereas Hindu women cited physiological indicators like the eruption of the first set of teeth as defining when to introduce solid foods. The Hindu households also practiced a ceremony called Onnoprosonno, the word onno means rice and prossono means to enter thus the ceremony marks the introduction of the first solid food. This ceremony is followed by the eruption of first sets of teeth as arrival of the first set of teeth indicates that the infant is now ready to consume solid foods. The onnoprosono ceremony is usually held at the infant's home or at the temple and is followed by a feast for the invited guests.

Women also distinguished between two categories of solids foods, norom, meaning soft, and shokto, meaning hard. Solid foods that were frequently reported in the norom category were lentil soup, rice, bananas, mashed potatoes, mashed pumpkin and mashed sweet potato. Frequently cited shokto, or hard foods, included eggs, apples, grapes and cookies. When introducing solid food women advised first starting with norom and then slowly transitioning to the shokto as the baby ages and learns to chew.

Pani Keno? Why Water?

In the rural sample a high proportion of mothers reported introducing water to the infants within the first three months of age. Fifty four percent of the women in the rural sample stated that water should be introduced at 21 days while 86 percent of the rural sample reported that infant should be given water from before three months of age. When
asked why water was being introduced early mother often responded with the phrase, *koliya shukai jai* meaning their chest gets thirsty and they believed that the infant cries out from this thirst of water. A sixteen-year-old mother of an infant explained, "*Around twenty one days of age my child started crying because his chest was dry and he needed water and then I fed him only few drops for a few days and half a teaspoon to quench his thirst.*" Similar to the feeding of prelacteals often the same mothers who reported exclusively breastfeeding their infant up to six months also reported introducing water to their infants with the first three months from birth. Because the amount of water given to infant comprised of only a few drops or a small spoonful women still considered the infant to be exclusively breastfed in spite of the early introduction to water.

**Conclusion**

My fieldwork with the slum dwellers in the urban city of Dhaka and rural site of Maijbaria highlights the significance of understanding context and environment for a holistic perspective on the cultural model of infant feeding among women in rural and urban Bangladesh. The previous quantitative chapter demonstrated that there was a single shared cultural model of infant feeding in Bangladesh, there was also intracultural variability in the model in terms of exclusive breastfeeding duration, age at introduction to water, and weaning practices. The quantitative analysis provides the basis, but the qualitative analyses presented in this chapter provides insight into what this means in the lives of these women. The quantitative analysis demonstrated the degree of differences in the infant feeding practices while the qualitative explained why the differences exist in the context of the environment women were residing in. By visiting the homes of the women, I was able to observe that in spite of the unsanitary environment the women
reside they keep their homes clean, which supports ratings task results that indicate that
women value the importance of cleanliness and its importance for infant health. Semi-
structured interviews with the women showed evidence of giving infants preleaseals in
the form of honey and sugar water. Qualitative analysis provided a much more
meaningful picture of the cultural model of infant feeding among women in rural and
urban in the context of their environment and their everyday life struggles.
CHAPTER VI
DISCUSSION AND CONCLUSION

This study examined the hypothesis that there is sufficient agreement to infer that there is single shared cultural model of infant feeding among women rural and urban Bangladesh. This study used theory and methodology based on cognitive anthropology to examine how the cultural knowledge is distributed among the respondents.

The results of the consensus analysis indicated that there was sufficient level of agreement or consensus among the respondents to constitute of a single shared cultural model of infant feeding among women in rural and urban Bangladesh. Free listing was conducted to produce the elements in the domain of infant feeding and pile sorting exercise helped conceptualize spatially how the respondents clustered or perceived the various elements within this model. Rating tasks elicited a culturally correct answer key which demonstrated how the respondents weighted each element in the cultural model in terms of their significance in keeping an infant healthy.

Standard deviation estimates from cultural consensus analysis along with the results of the semi-structured interviews and participant observation determined that there was intracultural variability pertaining to the cultural knowledge of infant feeding among women in rural and urban Bangladesh. Intracultural variability was observed in particularly in relation to the duration of exclusive breastfeeding, age at introduction of water, and weaning practices.
Research Implications

The results of this study contribute to a more holistic understanding of how women in rural and urban Bangladesh conceptualize elements related to infant feeding practices. In particular, the findings of this study have applications for healthcare practitioners and NGO workers serving mothers and infants in rural and urban Bangladesh. While working on my internship I observed the interactions between mothers and doctors during clinic visits. Mothers were asked if they exclusively breastfed, but doctors did not ask them if infants were given water or any other non-breast milk liquids. The findings from this research indicated that rural and urban women's definition of exclusion breastfeeding is inclusive of non-breast milk liquids like water and prelacteals and highlight the need for NGO or health care workers to probe specifically for water and prelacteals.

Evidence from the semi-structured interviews demonstrated that there was statistically significant difference among rural and urban respondents in terms of duration of exclusive breastfeeding, age at introduction to water and weaning practices. The average duration for exclusive breastfeeding in the urban sample was nine months in comparison to the average of six months for the rural respondents. With regards to age of infant introduction to water women in the rural sample reported introducing water earlier than the urban sample. Eighty six percent of subjects in the rural sample reported introducing water within three months of age while the average age of introduction of water was four months for the urban sample.

Qualitative analysis also indicated that in both the rural and the urban sample women were also given prelacteals to infants in the form of honey, sugar water and
mustard oil. Comparing the average duration of exclusive breastfeeding to the age at introduction of water within the urban and rural samples revealed that respondents’ emic definition of exclusion breastfeeding is inclusive of non-breast milk liquids like water and other prelacteals. Perhaps because the amount non-breastmilk liquid in the form of water or other preleacteal was often only a few drops to half a spoonful, mothers reported that they were exclusive breastfeeding in spite of giving non-breastmilk liquid to their infants. Considering this finding, healthcare practitioners and NGO workers serving mothers in rural and urban Bangladesh should separately probe mothers to elicit if they are giving water or other prelacteals to the infants as just asking them about whether they are exclusively breastfeeding their infants could be misleading. In a contaminated environment with lack of access to clean water, even few drops of water may have detrimental effects on the health of infants by exposing them to pathogens. While working on my internship at the NGO clinic that serves women in the adjacent slum, I often observed doctors ask mothers if they were exclusively breastfeeding while counseling them. The doctors did not separately ask regarding water or other prelacteals, and most mothers reported that they were practicing exclusive breastfeeding.

Consensus analysis produced a culturally correct answer key which measured how important each element was to participants in terms of keeping their infants healthy. Cleanliness, caring (for the infant), and husband were weighted as the most important elements by respondents in the study. The high rating of cleanliness indicated that women regard a sanitary environment as a necessary condition for keeping their infants healthy and free from disease vulnerability. This finding is significant as a lot of effort of the NGOs serving poverty-stricken mothers focus on educating mothers on the importance of
sanitary environment and hygiene. The results of this study demonstrate that women are well aware of the impacts of an unsanitary on the health of their infants and NGOs and health practitioners serving mothers should investigate the obstacles mothers face in maintaining a clean environment. Because husbands also were rated as important by women, health care practitioners and NGO workers should also investigate ways to involve husbands in helping to solve issues related to infant feeding and malnutrition. In the category of food, milk, vegetables and lentil soup or khichuri was rated as highly important in keeping infants healthy. While making food recommendations, healthcare practitioners should include food items that mothers already rate as highly significant.

There were significant differences between Hindu and Muslim households in terms of weaning practices and age of introduction of solid food. Twenty-four percent of women in the rural sample distinguished between breastfeeding duration between male and female infant as compared to only seven percent in the urban sample. Women in rural sample attributed to a Muslim custom that advises mother to breastfeed their male infant for 1.5—2 years while female infants were breastfeed to 2.5—3 years for the distinction. While in comparison women in the Hindu households reported biological cues like eruption of first set of teeth as guiding factors as to when to introduce solid food to infants.

The longer breast-feeding duration of female children is counter intuitive to existing literature on child survival and malnutrition rates in South Asia in correlation to the sex of infants. Several studies on malnutrition rates in South Asia have found that female children have a higher probability of suffering from malnutrition and mortality as compared to their male counterparts (Chen et al. 1981; Koening 1986; Hill et al. 1996;
Kaneta et al. 2000). Multiple studies provided evidence of lower intrahousehold allocation of nutritional resources to the female children (Bhuiya et al. 1987; Henry et al. 1993). Examining intra-household allocation of resources by gender, Chen et al. (2000) found that after controlling for variables like body weight and activity levels, male children received more proteins as well as calories compared to female children in the same sample. The bias towards female children in terms of nutritional resources can also have some interesting outcomes. For example, a study examining vitamin A deficiency among children in Bangladesh found that allocating better household nutritional resources to male children inadvertently resulted in female children consuming higher amounts of dark leafy greens, and thus suffering from lower rates of vitamin A deficiency (Webb 2002). This distinction between male and female breast-feeding rates in the rural site may have its roots in the variation of Islam that exists in the Feni district. Even though twenty seven percent of the rural respondents reported breast-feeding male infants for a shorter duration this does not mean that male infants are not receiving other high-quality resources related to other dimensions of infant feeding and care. The findings of this research highlight the significance of religious, cultural, and local context factors in influencing infant feeding decisions and their subsequent biological implications.

**Limitations**

This study examined cultural knowledge of women regarding infant feeding by interviewing mothers. Past research has shown the inconsistency of information when informants recollect events that have happened in the past. Conducting more observations would provide a better understanding of the actual infant feeding practices and the variability infant feeding practices. The difference between infant feeding practices
between the Muslim and the Hindu households was examined in the village site as a large Hindu community lived there and my research assistant, Asma, was familiar to the Hindu households and often accompanied me to their homes. In contrast, Hindu households in the city were not centralized. I met far fewer Hindu women in the urban site and thus was not able to determine if infant feeding practices differed there. The sample size was also a limiting factor. The rural sample was only 29 women and the urban sample was 38. A larger sample would provide greater strength to statistical analyses and intracultural variability.

Freelisting was conducted mainly with the urban population with the additional terms added from semi-structured interviews with the rural population. This likely influenced the specific terms that created the basis for sorting and rating tasks. In addition, the specific questions that were asked also influenced responses, which is evident in hierarchical clusters in the MDS map. The blue circle in the map associated with the category of infant nutrition related to the freelisting question of, "What solid foods are best for the infant", similarly the second cluster relating to financial and healthcare resources relates second question asked in free listing, "What is required to keep an infant healthy" and the third cluster of social support relates to the additional terms I added after conducting semi-structured interviews with the rural sample. Future research should incorporate more broadly worded freelisting questions.

**Conclusions**

This study provided evidence that there is a single shared cultural model of infant feeding among women in rural and urban Bangladesh. The study also demonstrated that within this shared model there was intracultural variability between the rural and the
urban sample in terms of duration of exclusive breastfeeding and age at introduction to water. By conducting free listing, and rating tasks this study elicited the elements in this model that mothers weighted highly and pile sorting task helped demonstrate how women conceptualize the relationship between the different elements within the cultural model of infant feeding among women in rural and urban Bangladesh. Lastly this study highlighted the importance of cultural and religious factors influencing infant feeding decisions like duration of breast feeding, weaning and introduction to solid. The findings of this study can be used to assist healthcare practitioners and NGO workers in attaining a more holistic understanding of how women conceptualize infant feeding practices pertaining to exclusive breastfeeding, weaning, age at introduction of water and introduction to solid food.
REFERENCES


APPENDIX A

INTERVIEW SCHEDULE
Interview Schedule

Case ID#

Date:

Location:

Age: Over 18: (Yes/No)

Researcher Signed Informed Consent: (Yes/No)

Demographic Information:

1. Sex

   2. How old are you?
   3. How many people reside in your household?
   4. How many children do you have?
   5. Ages of people residing in the household?
   6. What is your household income?
   7. What is your monthly expenditure? Breakdown if possible.
   8. How much education have you completed?
   9. Do you work? If so, what do you do?
  10. What are the occupations of the people who live in your household?

Free Listing

- What is required to keep an infant healthy?
- What constitutes of good nutrition for the infant?
- What should you feed your baby?
- What should an infant consume to be healthy?
- How long should an infant be breastfeed?
- How long should an infant be breastfeed?
Please sort these cards by the terms on the cards into as many piles as you wish and in any way you wish:

Pile 1:

Pile 2:

Pile 3:

Pile 4:

Pile 5:

Pile 6:

2. Why did you sort these cards like this? Can you explain why you made each pile the way you did?

3. Now please rate these terms from 1 to 5. One being most important and 5 being the least important:

   Rated 1:
   Rated 2:
   Rated 3:
   Rated 4:
   Rated 5:

4. Could you please explain why you rated them in importance the way you did?
Qualitative Interviews

1. What is your marital status:
2. What age did you get married?
3. What was your age when you had your first infant?
4. Age of your husband?
5. What is your husband's education level?
6. Do all your children attend school? If so, what grade?
7. How long have you lived in Dhaka/Feni?
8. If migrated to Dhaka? When did you migrate and why?
9. Describe major problems you had (or have) in keeping your family healthy?
10. What factors can cause a infant to be malnourished or vulnerable to diseases?
11. List the factors in terms of their importance.
12. How much of your income monthly is spent on food per week?

Breastfeeding

13. How long should an infant be breastfeed?
14. How many times should an mother breastfeed her infant in a day?
15. Should an infant be given colostrum? Why or why not?
16. Describe how long the duration of exclusive breast-feeding should be for a healthy infant.
17. When should a mother stop breast-feeding their infant?
18. Are there any signs when you should stop giving breast-milk to your infant? If so, what are they?
19. Is breast milk enough to meet the infant's needs? If not, what other foods should be provided?
20. How should the infant be weaned from breast milk?
Complementary Feeding:

21. What solid food items should the infant get to be healthy?
22. When should solid food be introduced to the infant?
23. What kind of solid foods are best for the infant?
24. List the food items in terms of their importance
25. Describe any food items that an infant should avoid? Why?
26. Describe what foods the infant should consume from birth to 1 year?
27. Describe what foods the infant should consume from birth to 2 year?
28. Are there any signs when you should start giving solid food to your infant? If so, what are they?

Other

29. If an infant gets sick where should the mother get help?
30. What is the most helpful place or person from where the mother can obtain help if her infant is suffering from ill health?

If Respondent has an infant:

31. How long did you breastfeed your infant?
32. How long did you exclusively breastfeed your child? Probe.
33. Describe any troubles you had while breast-feeding your infant?
34. Did you feed your infant colostrum?

a. If so, for how many days and who told you about it?

31. How long did you exclusively breastfeed your infant?
32. Describe any trouble you had while you were exclusively breastfeeding your infant?
33. Describe what actions you took to deal with the troubles you had while exclusively breastfeeding your infant?
34. How many times during the day did you breastfeed your infant?
35. How long was each session of breast-feeding?
36. Describe feeding during the night?
37. Did you co-sleep with your infant?
38. Describe any signs from your infant that indicated he/she wasn’t doing well on being breastfeed?
39. How long was your infant on breastmilk along with solid food?
40. Describe how you changed the amount of breast-milk and solid food the infant received with the age of the infant?
41. Describe what factors influenced your decisions of how much breast milk or solid food you gave to the infant?
42. Describe the reasons why you stopped breastfeeding your infant?
43. Did your infant consume formula milk? If so, then for how long?
44. Describe factors influencing your decisions to give your infant formula?

**Infant Complementary Feeding:**

49. When was your infant first given solid food right after birth?
50. Describe what your infant consumed the first week of his/her life?
51. Did you give your infant any solid food the first week or month after birth?
52. What did you feed him/her today and yesterday?
53. Give me the names of the solid food you are giving him?
54. Why these solid foods?
55. Describe any troubles you had while feeding your infant solid foods?
56. Describe a typical day with your infant.
57. How do you make decisions in the house about what the infant eats and how much?
58. Did you talk or consult with anyone about what to feed your infant? If yes, who and what did they say?
59. Describe how you learned how to feed and take care of your infant?
60. Are there any members of your family, kin or your community that gave you advice on how to feed your infant?

49. Describe what they said?
50. How much of your income is spent on the infant's food?
51. Describe what major burdens or obstacles you faced in keeping your infant healthy?

a. For the obstacles you mentioned earlier describe what you think would help lessen them.

49. Describe what foods your infant consumes from birth to one year.
50. Describe any signs from your infant that indicated he/she was ready for solid food?
51. When did you introduce solid foods to your infant?
52. Describe the solid foods given to him?
53. Describe any troubles you had while feeding solid food to your infant?
54. Describe what actions you took to deal with troubles you had while feeding your infant solid food?
55. Describe how the variety of solid food changed with the infant's age?
56. Describe any solid food that you avoided for your infant? Why?
Infant Other:

72. Has your infant been sick since he/she was born?
73. a. If so then what did you do to take care of your infant?

74. When did your infant get sick last. What do you thing caused it?
75. Difference between batash and biomedical diseases?
76. Describe how you managed to feed your infant and your family?

Maternal and Family Health

77. How was your health while you were breastfeeding your infant?
78. What did your diet constitute when you were pregnant? Do you think it was sufficient?
79. Do you think your health had an impact on the breast milk? If so, describe.
80. Do you think your health had an impact on the breast milk? If so, describe?
81. Is there any food items or activities that the mother should avoid after giving in birth? Why?
82. Is there any food items or activities that the mother should avoid while she is pregnant? Why?
83. While you were raising your infant did the rest of the family have adequate nutritious food?
84. Describe your experience with the hospitals and healthcare workers in regards to your infant health.
85. Where did you give birth?
86. If you gave birth at home describe the advice you were given on how to feed and take care of your infant.
87. What was your infant's weight at birth?
88. How was your health during your pregnancy?
89. How long after you gave birth did you start menstruating?
90. Describe any food you avoided during your pregnancy? Why?
91. Described you avoided after birth? Why?
92. What is your family's typical diet?
93. Describe how you decide what the family eats?
94. Where do you obtain water?
95. Where did you obtain the water that as given to your infant?
96. Did you visit any clinic or health care facility while you were pregnant? Describe?
97. Did you have to pay dowry after your wedding?
98. Are there any NGO, government or healthcare workers near your village?