Relationship of Acculturation with Breastfeeding Initiation and Duration in Hispanic Women

Robin J. Henson

Texas Woman’s University

Author Note

This research was conducted by Robin Henson, Doctor of Nursing Practice student, Texas Woman’s University, Dallas, TX in partial fulfillment of the requirement for DNP Capstone NURS 6303.

No grants of financial support were received for this study. Dr. Susan Chaney, Dr. Peggy Mancuso, and Dr. Barbara Gray assisted with the critique of this manuscript.

Correspondence concerning this article should be addressed to Robin Henson, Cuddle Care Health Clinic, Denton, TX, 76201.

Email: rhenson@twu.edu
Acknowledgement Page

I would like to express my deepest gratitude to my committee chair, Dr. Susan Chaney who has patiently guided me through this capstone project. She continually provided me with positive feedback, support, and encouragement throughout this past year.

I wish to thank all of the members of my capstone committee for their thoughtful advice and willingness to contribute their knowledge to aid in my research study. Dr. Peggy Mancuso helped me with many aspects of this project, including my original proposal and data analysis. Dr. Barbara Gray provided her pediatric expertise during the early stages of this project.

I would like to thank Jeff Barrett for his many consultations regarding the statistical analysis from this study. Thank you for your patience to my endless queries and for helping me “make sense” of it all.

I wish to thank Eugenia Aragon for assisting in the administration of the study surveys and provision of Spanish interpretation to the Hispanic study participants. Your enthusiasm and dedication to this project was invaluable.

To my children, Kevin Jr., Jessica, and Jonathan, thank you for always encouraging me and telling me, “You can do it, Mom.” Finally, to my husband, Kevin, thank you for the many times that you have read through this study. I could not have made this exciting journey without your encouragement and support. Thank you. I love you.
# Table of Contents

Abstract.................................................................................................................................4  
Introduction..........................................................................................................................5  
Purpose.................................................................................................................................7  
Research Question...............................................................................................................7  
Definition of Terms...............................................................................................................7  
Theoretical Framework........................................................................................................8  
Review of the Literature......................................................................................................10  
  Hispanics in the United States............................................................................................11  
  Acculturation.....................................................................................................................15  
  Breastfeeding Initiatives and Studies..................................................................................18  
Project Implementation.........................................................................................................26  
Results, Evaluation, and Discussion.....................................................................................30  
Conclusion............................................................................................................................39  
References.............................................................................................................................39  
Appendices............................................................................................................................49  
  A. Breastfeeding Rates: Longitudinal Study Results..........................................................49  
  B. Timeline........................................................................................................................50  
  C. ARSMA-II OrthogonalScoring......................................................................................51  
  D. Demographic and ARSMA-II Survey..........................................................................52  
  E. IRB Approval Letter........................................................................................................60  
  F. Sample Demographic Results......................................................................................61  
  G. Sample Correlation Results.........................................................................................65
Abstract

Research supports breastfeeding as optimal infant nutrition; however, United States breast feeding initiation and duration rates have declined particularly among low incomes groups, minority groups and Hispanic women. Previous studies examined the impact of acculturation on the Hispanic woman’s breastfeeding practices noting an inverse relationship. The purpose of this study was to assess the relationship of acculturation with breastfeeding initiation and duration rates in postpartum Hispanic women and to initially test the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II). The Health Promotion Model (HPM) was the theoretical framework for this study. Demographic and ARSMA-II scores were obtained from a convenience sample of 110 Hispanic, postpartum women. There was a weak, significant, negative correlation between acculturation and 2 week breastfeeding duration ($r_s=-.228, p<.05$). There was a moderate, significant, negative relationship between acculturation and 4 week breastfeeding duration ($r_s=-.304, p<.01$). This study’s findings provided a first step in determining cultural interventions necessary for improving breastfeeding behaviors in the Hispanic population, an objective of Healthy People 2020. Identifying creative interventions that reduce barriers, increase self-efficacy, and include cultural values will enhance the appropriateness of future breastfeeding interventions.

*Key words:* acculturation, breastfeeding, Hispanic, ARSMA-II
Relationship of Acculturation with Breastfeeding Initiation and Duration in Hispanic Women

Advanced practice nurses, especially those prepared with a Doctor of Nursing (DNP) degree, are in a strategic position to promote the health of individuals, communities, and the nation. The endorsing and promoting of breastfeeding provides benefits on all of these levels (Gill, 2009). Breastfeeding rates in the United States are lower than in most countries and these lower rates result in poorer health indicators and increases in health care costs (United States Department of Health and Human Services [USDHHS], 2007a).

Problem Identification

The health benefits of breastfeeding obtained by the infant and the mother are indisputable. It is well documented that breastfeeding offers superior nutritional, immunologic, developmental, and preventive factors against obesity and related chronic illnesses in the infant. For the mother, breastfeeding provides a more rapid return to pre-pregnancy weight, an overall sense of wellbeing due to the influx of prolactin, and a risk reduction against osteoporosis and certain cancers (Hill et al., 2009; Nichols, Schutte, Brown, Dennis, & Price, 2009). The health benefits translate into a potential annual savings of over $3.6 billion dollars in U.S. healthcare costs (Gartner et al., 2005). Although research supports breastfeeding as optimal infant nutrition, rates of initiation and duration have declined in the United States since 1990. Breastfeeding rates are further reduced in low income and minority groups, particularly in Hispanic women (McKechnie, Tluczek, & Henriques, 2009; Singh, Kogan & Dee, 2007).

Significance

According to Hernandez (2006), increasing breastfeeding initiation and duration rates in this country is an upstream, health promoting behavior that advances the health of its participants
and preserves health care dollars. Many studies have been conducted on proposed variables that promote and discourage breastfeeding; however, the majority of research has been conducted on non-Hispanic, White, middle-class women. The author asserted that the findings from these studies were used to guide the development and implementation of national breastfeeding programs. Minimal research has been conducted on Hispanic women residing in the United States, despite the fact that the Hispanic population has significantly increased (Hernandez). Many variables that impact the Hispanic woman’s decision to breastfeed have either not been identified or not been pursued. Rates for Hispanic breastfeeding in the United States surpass rates for non-Hispanic whites women, yet rates in Mexico far exceed those in the United States (Gonzalez-Cossio et al., 2003). Level of acculturation has been investigated in the literature and proposed as a factor that influences breastfeeding decisions of the Hispanic woman. Determining the relationship of the level of acculturation and breastfeeding in the Hispanic population provides information for the development and implementation of culturally appropriate breastfeeding programs.

**Context**

Cuddle Care Health Clinic (CCHC) services medically underserved infants born in Denton County, Texas. The population demographics at the CCHC are composed of 60% Hispanic, 28% non-Hispanic white, 10% African American, and 2% other ethnicities. The mission of CCHC is to provide high-quality, culturally sensitive healthcare to low income and minority infants, who would not normally be able to access care. The CCHC provides a temporary medical home for the infants’ first 30 days of life. A Pediatric Nurse Practitioner (PNP) provides two well-baby examinations for each infant, one within the first few days after hospital discharge and again at 2 weeks of age. Non-English speaking Hispanic families receive
Spanish translation. To further promote health, infant feeding practices are assessed and breastfeeding counseling is provided at each patient encounter.

**Purpose**

**Purpose Statement**

The purpose of this descriptive correlational study was to assess the relationship of acculturation with breastfeeding initiation and duration rates in postpartum Hispanic women and to initially test the Acculturation Rating Scale for Mexican Americans-II (ARSMA-II) with breastfeeding in this population. The identified problem was addressed with the following research question.

**Research Question**

What effect did acculturation, as measured by the ARSMA-II, have on breastfeeding initiation and duration in Hispanic women?

**Definition of Terms**

For the purpose of this study it was important to define the concepts under investigation. Definitions of acculturation, breastfeeding, and Hispanic were constructed to provide clarity and consistency.

*Acculturation.* Acculturation was defined as a continuous and dynamic process that occurred when individuals from different cultures come into contact with each other, producing degrees of physiologic, psychological, and social changes. Acculturation was not limited to a linear process because it does not necessarily lead to assimilation or a loss of an individual’s ethnic identity (Beck, Froman & Bernal, 2005; Gorman, Madelensky, Jackson, Ganiats, & Boies, 2007). For this study, acculturation was measured by the ARSMA-II.
**Breastfeeding.** Breastfeeding was defined as the receipt of any breast milk within a 24-hour period. This included exclusive breastfeeding, breastfeeding with any amount of formula supplementation, and pumped breast milk fed to the infant through a bottle (American Academy of Pediatrics [AAP], 2005; Nichols et al., 2009).

**Hispanic.** Hispanic was defined as individuals of Mexican, Puerto Rican, Cuban, Central American, or South American heritage. Although historically linked by the Spanish language, individuals were considered Hispanic if they spoke the Spanish or English (United States Census Bureau [USCB], 2003).

**Theoretical Framework**

The health promotion model (HPM) was chosen as the framework for this study because it best represented the concepts and the dynamic relationships necessary to produce the healthy behavior of breastfeeding. The HPM was first introduced in the early 1980’s. The foundation rested on social-cognitive and expectancy theories (Bandura, 1986; Feather, 1982). Studying the factors that influence the behaviors of individuals, the HPM was the combination of the behavioral sciences and nursing (Pender, 1982). Pender recognized that motivating individuals toward health enhancing behaviors was a complex biopsychosocial process. Internal and external factors contributed to one’s choice to initiate and continue health-promoting behaviors. In 2002, the HPM was revised to more clearly reflect these factors. The new HPM included three new variables and alterations in its interrelationship schema (Pender, Murdaugh, & Parsons, 2005).

The HPM identified ten factors, or determinants, that influenced health-promoting behaviors. These 10 determinants were grouped into two main categories: (a) individual characteristics and experiences and (b) behavior-specific cognitions and affects. Schlikau and Wilson (2005) proposed that factors that affected breastfeeding behaviors were analogous with
these 10 HPM determinants. Concerning individual characteristics and experience, the authors noted that prior behavior and personal factors affected the decision to initiate and continue breastfeeding. Women who have successfully breastfed their other children were more likely to breastfeed in the future. Personal factors included age, self-esteem, and socio-cultural variables, such as ethnicity and acculturation. Personal factors influenced the Hispanic woman’s decision to breastfeed. Pender noted that the health behaviors of vulnerable populations, such as Hispanic women, are strongly influenced by their acculturation (Pender et al., 2005).

The remaining eight determinants were embedded in the behavior-specific cognitions and affect category. This category involved the inward perceptions and outward influences faced by the mother. A woman’s decision to breastfeed was influenced by her perceptions of perceived benefits as well as perceived barriers. The Hispanic woman’s decision to stop breastfeeding was based on the perception that her infant was not getting enough milk or the infant preferred the bottle (Hurley, Black, Papas, & Quigg, 2008). The determinant, self-efficacy, impacted a mother’s decision to initiate and to continue breastfeeding. For example, continuous breastfeeding success with her infant, demonstrated through an increase in her infants’ weight, reinforced the mother’s confidence in her abilities, thus increasing her perceived self-efficacy. Formalized tools, such as the Breastfeeding Self-Efficacy Scale, were used to predict breastfeeding initiation and duration rates in different populations (Dennis & Faux, 1999).

Another determinant, activity-related affect, was demonstrated by the sense of wellbeing described by breastfeeding women when they experience an influx of prolactin (Hill et al., 2009). Interpersonal and situational influences such as support, comfort, or embarrassment from family, friends, and healthcare providers all influenced breastfeeding decisions. Finally, competing demands, such as the need to work, can influence whether breastfeeding is plausible.
Schlickau and Wilson (2005) also noted that availability of formula at the hospital provided an opportunity for alternative behavior. This alternative behavior was also categorized as a competing demand.

A health promoting behavior is a perpetual, consistent, yet modifiable pattern of behavior, integrated into a daily way of life (Schlickau & Wilson, 2005). Breastfeeding is a continual process that promotes health and prevents potential diseases for both the mother and the infant. Thus, breastfeeding is defined as a health promoting behavior. Although it is a physical process, many environmental, social, and psychological elements contribute to its successes and failures. In the HPM, the individual is multi-dimensional and continually acts and reacts with internal and external factors. According to this model, a new mother has many variables that influence whether she will breastfeed. If she does breastfeed, these variables also influence breastfeeding duration. Examining the personal factors, and even more specifically, the level of acculturation, the DNP can determine how this determinant can encourage breastfeeding rates in the Hispanic woman. (Hernandez, 2006; Pender et al., 2005).

Review of the Literature

The following review of the literature contains search strategies used by the researcher. An overview of Hispanics in the United States, acculturation, and breastfeeding initiatives and studies were also examined.

Search Strategies

A comprehensive literature search was conducted using the electronic databases, PubMed, MedLine, ScienceDirect, and CINAHL Plus with full text. Articles published in English language between 1980 and 2010 were reviewed. The following key words and different variations were used: Hispanic, acculturation, breastfeeding, ARSMA-II, and nutrition.
Additional empirical articles cited in the reference lists were also reviewed. Articles that addressed breastfeeding initiation and duration measurements were used. The final articles were selected based on their date of publication and their relevance for understanding how to advance knowledge in this field. The review was conducted between 2009 and 2010.

**Hispanics in the United States**

In order to gain an understanding of Hispanics in the United States, it was necessary to investigate current statistics on population, immigration and health disparities. Breastfeeding studies conducted on Hispanic women were also evaluated.

**Population.** In 2007, over 4 million infants were born in the United States. Of those births, 1 million, or approximately 25%, claimed Hispanic ethnicity. In Texas, over 400,000 infants were born in 2007. Approximately 50% of these Texas births were born to Hispanic women (Hamilton, Martin & Ventura, 2009).

In 2001, 25% of Hispanics living in Texas were living at or below the poverty level. Individuals that live in poverty tend to attain less education. In Texas, 49% of individuals living in poverty had not completed a high school education, while only 4.2% had a college degree (USCB, 2003). The disadvantage of low socioeconomic status (SES) and limited education increases this populations’ risk for health disparities (Arredondo, 2007).

**Immigration and health disparities.** Poverty and immigration affect health. Children of immigrants are among the poorest, least insured, and have limited access to healthcare. The greatest proportion of immigrants come to America from Mexico and it is estimated that in 2025, the pediatric population will be comprised of approximately 24% Hispanics (USCB, 2006). Between 1999-2004, U.S. children under the age of 19 had a 17% reported obesity rate and 33.6% were at risk for being overweight (Ogden et al., 2006). In the same study, the rates for
Hispanic children were even more disconcerting. The authors reported that over 19% of Hispanic children were overweight, and 37% were at risk for becoming overweight. In 2008, Hispanic children living in the United States ages 2-5 years had reported obesity prevalence of 18.3% and were 36.2% risk for being overweight (Polhamus, Dalenius, Mackintosh, Smith, & Grummer-Strawn, 2009).

The Hispanic population is burdened with additional risk factors for childhood obesity. These include parental obesity, recent immigration, and acculturation to U.S. diet and sedentary lifestyle (National Collaboration on Child Obesity and Research [NCCOR], 2009). As Hispanics living in the United States become acculturated, the persons have a higher reported body mass and demonstrated less healthy dietary practices than those Hispanic individuals who were less acculturated (Mendoza, 2009). Thus, the number of Hispanic-American children with obesity, hypertension, and diabetes will continue to rise, and then chronic conditions will progress as these children become adults. Three of the top 10 leading causes of death for Hispanics are heart disease, stroke, and diabetes. They are 1.6 times more likely to die from diabetes-related complications compared with White, non-Hispanic ethnic groups (NCCOR). In order to assure culturally competent care, health professionals must recognize the health disparities that exist among immigrant children, especially Hispanics (de Montoya, 2007).

**Breastfeeding studies.** Findings from national studies suggested that the percentage of breastfeeding initiation and duration for Hispanic women in the United States were higher than the rates for White, non-Hispanic women. In 2008, 74% of Hispanic women who gave birth initiated breastfeeding. At 6 months 38% were still breastfeeding, and 29% were reported to be breastfeeding at 12 months duration (Centers for Disease Control and Prevention [CDC], 2009b). In comparison, a study conducted in Mexico, the National Nutrition Survey-1999 (NNS-1999),
reported higher rates of initiation and longer duration. In this study, Hispanic women residing in Mexico had rates of 92% initiation, and 70% and 31% continued breastfeeding at 3 months and 12 months, respectively (see Table A1) (Gonzalez-Cossio et al., 2003). Noting the differences in these rates, studies have been undertaken to examine the effects of acculturation on breastfeeding. Gibson, Diaz, Mainous, and Geesey (2005) related attitudinal changes regarding breastfeeding practices to high levels of acculturation, and noted that Hispanic women with higher levels of acculturation were 33% less likely to breastfeed than those with lower acculturation. Harley, Stamm, and Eskanazi (2007) confirmed that women who resided in the United States less than 5 years were more likely to initiate and continue breastfeeding at 4 months. In the National Health and Nutrition Examination Survey (NHANES) 1999-2000, self-reported breastfeeding rates were higher in less acculturated Hispanic women than those with high acculturation (59% vs. 33%) (CDC).

Researchers have studied the use of formula supplementation and breastfeeding. In the United States, during 2008, one in four infants were given formula within the first 2 days of life (CDC, 2009b). Exclusive breastfeeding (EBF) rates were low for Hispanic women, and over 60% of Hispanic women reported the use of some formula within the first month (USDHHS, 2007a). Hopkinson and Gallager (2009) asserted that when breastfeeding support was offered within 12 to 36 hours of the infant’s birth, EBF increased from 10% to 16% in the Hispanic population. A qualitative study by Bunik et al. (2006) determined Hispanic women that breastfed also supplemented with formula because the women were concerned that their infants needed additional vitamins that commercial formula provided. The women were also more likely to use formula due to the prompting of close relatives. McKee, Zayas, and Jankowski (2004) examined low-income Hispanic (57%) and African American (43%) women and their
breastfeeding behaviors at 2 weeks and at 3 months. When Hispanic women introduced formula to their infants by 2 weeks of age, all were likely to cease breastfeeding by 3 months. In a study of over 6700 low-birth-weight babies born in 2005-2006, 58% of Hispanic infants were breastfed at discharge, as compared with 63% non-Hispanic newborns (Lee & Gould, 2009).

Other breastfeeding variables have been examined in the Hispanic population. Postpartum depression, the support of the infant’s father, age of the mother, and SES level were not predictive of breastfeeding in Hispanic women (Beck et al., 2005; Hurley et al., 2008). Further studies indicated that successful breastfeeding among Hispanic mothers was related to early, culturally appropriate prenatal education. Different studies suggested that visits to a healthcare provider within 2-weeks of delivery were related to successful breastfeeding initiation and duration (Gill, 2009; Mann, Reifsnider, Gill & Ritsema, 2003; O’Brien, Buikstra & Hegney, 2008).

There were many gaps identified in breastfeeding studies and Hispanic women. First, the quantity of studies conducted on Hispanic women in the United States has not kept pace with the increased growth rate of the Hispanic population (Hurley et al., 2008). Second, the quality of studies was not equivalent with studies conducted on White, non-Hispanic women. Hispanic subgroups, such as Cuban, Latin American, and Puerto Rican, were not differentiated from Mexican women. Many studies did not differentiate between EBF and partial breastfeeding (Lee, Elo, McCollum & Culhane, 2009). Schlickau and Wilson (2005) asserted that the dynamics between breastfeeding, acculturation, and Hispanic women were not consistently represented. The authors reviewed studies that pertained to breastfeeding as a health promoting behavior in the Hispanic population and they noted that the majority used sample sizes that ranged from 3% to 17%. The majority of the studies under represented Hispanics and did not
represent the national population. Previous studies used descriptive study methods (64%), while only 16% of breastfeeding studies used experimental and randomized control groups to obtain quantitative data.

**Acculturation**

Although commonly researched, acculturation was difficult for researchers to characterize because acculturation contained many intricately woven constructs. Existing research has discussed the definitions, dietary practices, and commonly used measurement tools of acculturation.

**Definitions.** In a systematic review of published research on acculturation, only 61% of authors provided an operational definition of acculturation. Acculturation was originally viewed as a unidimensional, or linear process, in which the individual abandons one culture and fully assimilated into a new culture. This over simplification ignored embedded values, behaviors, and beliefs that influenced the individual. Over time, multi-dimensional definitions of acculturation have emerged (Thomson & Hoffman-Goetz, 2009).

Berry (2003) recognized that when individuals migrate to a new culture they do not automatically abandon the old culture nor do the individuals always embrace their new culture. A more complex interaction occurred because individual values, beliefs, and behavioral attributes influenced diverse responses to cultural change. The author asserted that individuals select and reject aspects of the original culture and the new culture. The theory added depth to the original definition of acculturation by identifying four distinct acculturation outcomes: separation, marginalization, integration, and assimilation. Separation resulted when the individual embraced the culture of origin and refused to accept the new culture. Marginalization was demonstrated when the individual did not identify with the old or the new culture.
Integration occurred when the individual maintained behaviors from the culture of origin and also assumed behaviors from the new culture. Finally, assimilation was characterized by the rejection of the original culture and the total acceptance of behaviors of the new culture (Berry; Schwartz & Zamboanga, 2008).

**Dietary practices.** Research supported a link between suboptimal dietary choices and acculturation. It is referred to as *dietary acculturation* of immigrants. Three possible outcomes occur with dietary acculturation and parallel Berry’s (2003) acculturation theory: (a) maintenance of traditional dietary patterns (traditional), (b) complete adoption of the new culture’s dietary patterns (assimilation), or (c) combination of traditional and newly adopted dietary patterns (marginalization) (Perez-Escamilla & Putnik, 2007).

Acculturation affects the dietary intake of Hispanics living in America. Guadalupe, Baquero and Klinger (2008) noted that less acculturated Mexican-Americans consume smaller portions, greater amounts of fruits, vegetables, and less fast food. During pregnancy, women with lower acculturation consumed healthier diets than their higher acculturated counter-parts. Higher acculturated Mexican-Americans consumed more processed sugar and sugar-laden drinks (Perez-Escamilla & Putnik, 2007).

Dynamic relationships between dietary acculturation, socioeconomic, demographic, culture, and environmental factors were noted to influence the infant and child feeding practices of acculturating parents. Dietary acculturation influenced early infant feeding practices, such as the decision to initiate breastfeeding or the duration of breastfeeding. Parental influence on the eating habits of their children and specific parenting styles, including infant feeding, put the child at risk for future health problems such as obesity, diabetes, and hypertension (Arredondo, 2007).
Measurement tools. Inconsistent research findings occurred when the measurement tool chosen by the researcher did not match the operational definition provided (Cuellar, Arnold & Maldonado, 1995). Thomson and Hoffman-Goetz (2009) identified the use of proxy and formal measurement tools in acculturation research. The authors ascertained that even when an operational definition of acculturation was provided, researchers only used a measurement tool 67% of the time.

Although formal tools were available to measure acculturation, the majority of researchers chose proxy measurements to quantify acculturation. Proxy measures included the primary language spoken, immigrant status, ethnicity, or the length of time the individual has lived in the new culture (Thomson & Hoffman-Goetz, 2009). In one study, Mexican-American postpartum women, categorization of high and low acculturation groups was based on their primary language spoken. The authors affirmed that women who spoke Spanish were more likely to breastfeed (Gorman et al., 2007). In addition to the primary language spoken, Gibson-Davis and Brooks-Gunn (2006) studied immigration status. They found that Hispanic immigrants had higher reported rates of breastfeeding than non-immigrants. In 2002, the National Immunization Survey (NIS) used ethnicity categories such as Hispanic and non-Hispanic White as a means determining acculturation with breastfeeding habits (Li, Darling, Maurice, Barker, & Grummer-Strawn, 2005). Studies have also measured acculturation by the duration of a person’s residency in the United States. Harley et al. (2007) suggested that Hispanic women residing in the United States longer than 5 years were noted to have decreased rates of breastfeeding. Proxy measures were common and convenient techniques used; however, debate remained as to whether this method comprehensively represented the individual’s acculturative changes.
There are three classifications of formalized tools used to measure acculturation: unidimensional, bidimensional, and multidimensional. Unidimensional tools produced linear scores on a continuum from non-acculturated to acculturated. The scores represented the losses of one culture and the gains of another culture. Cuellar, Harris, and Jasso (1980) designed a unidimensional instrument, the ARSMA. Although this scale had been used extensively in acculturation research, the scale failed to include important cultural contributors such as traditional dietary and social support constructs (Thomson & Hoffman-Goetz, 2009). Most unidimensional scales failed to capture those individuals who are bicultural because they did not identify those who can assimilate portions of Hispanic and American cultures. On the other hand, bidimensional tools measured attitudes, behaviors, and beliefs. A bidimensional tool provided separate scores for the new culture and the culture of origin. A grass roots study recognized the importance of including bicultural and ethnic loyalty in its study design. The authors constructed a questionnaire incorporating questions that measured separate scores for the participant’s involvement with Mexican and American cultures (Scrimshaw, Engle, Arnold, & Haynes, 1987). Finally, multidimensional tools were designed to individually integrate several dimensions of acculturation, such as values, attitudes, and ethnic relations. An example of a multidimensional instrument is the ARSMA-II (Cuellar et al., 1995).

**Breastfeeding Initiatives and Studies**

A national health promotion and illness prevention initiative, Healthy People was inspired by national, longitudinal studies. These studies, in turn, helped inspire the Baby-Friendly Hospital Initiatives (BFHI) and improve the Women’s, Infants, and Children (WIC) initiative.
Healthy People initiatives. The U.S. Department of Health and Human Services (HHS) established the Healthy People initiatives in an effort to increase quality of life and eliminate health disparities for all Americans. The researchers used the findings from scientific research, advice from advisory committees and input from the public sector, and established 10-year national objectives. (USDHHS, 2000).

Healthy People 2010 (HP 2010). The HHS recognized the health benefits for the infant and mother dyad provided through mother’s milk. The authors established recommendations to increase the rates of breastfeeding initiation and duration by 2010. HP 2010 established recommendations to increase the rates of breastfeeding initiation and duration. Objectives 16-19 proposed an increase in the proportion of mothers that breastfeed their babies in: (a) the early postpartum period, (b) at 6 months, and (c) at 12 months (USDHHS, 2000). The HHS used data obtained from the Ross Mothers Study (RMS) to establish a baseline for their goals (Ryan, 2005). The RMS determined that in 1998, only 66% women initiated breastfeeding, 28% continued at 6 months, and only 19% were still breastfeeding at 1 year. The findings for Hispanic women during this time period were a bit more promising than the national average in that 92% Hispanic women initiated breastfeeding, 55% continued at 6 months, and 31% were still breastfeeding at one year (Ryan, Zhou & Gaston, 2004). The HHS published their final objectives in hopes that 75% of all women would initiate breastfeeding, 50% would continue at 6 months, and that 25% would still be breastfeeding at 12 months. In 2003, the AAP recommended that EBF without supplemental liquids or foods should be maintained for 6-months to produce optimum infant health (AAP, 2005). Following their recommendation, the HHS added two supplementary goals to include monitoring the rates of EBF at 3 months and also at 6 months (see Table A1) (USDHHS, 2007a; 2007b).
Healthy People 2020 (HP 2020). The HHS used data obtained through longitudinal studies to monitor its progress. In addition to the RMS, other studies included the National Immunization Survey (NIS), the NHANES, and the Infant Feeding Practices Study I and II (IFP-I & IFP-II). Key results from the 2006 NIS study confirmed that HP 2010 breastfeeding objectives were not being met in the United States. In 2009, only 10 states achieved all five HP 2010 objectives. Only 13 states met the goal of breastfeeding duration for 6 months (CDC, 2009a). Proposed HP 2020 objectives are on the horizon and projected to be published within the next year. The HP 2010 Objectives 16-19 will be retained and remain unchanged for HP 2020. A new objective, to decrease the percentage of breastfeeding newborns that receive formula supplementation within the first two days of life, is currently proposed (HP 2020, 2009).

National longitudinal studies.

Although many breastfeeding studies have been conducted on women in the United States, the national, longitudinal studies provided invaluable information about the rates of breastfeeding initiation and duration for Hispanic women. In addition, the data obtained from the RMS, National Immunization Survey (NIS), and the Infant Feeding Practices (IFP) were used to guide national initiatives. Breastfeeding data obtained from these studies can be found in Appendix A.

Ross Mothers Study (RMS). Ross Laboratories has studied infant feeding trends in the United States since 1954. The RMS was a compilation of survey questions mailed to over one million women in the United States. The survey determined predictors of breastfeeding behaviors based on geographic regions. The survey, mailed monthly to postpartum women, collected breastfeeding and initiation data on infants ages 1-12 months of age. The data obtained was real time and was not based on recall bias (Ryan, 2005). Although the survey response rate
was low (28%) the RMS yielded approximately 290,000 returned surveys. Of the total participants, over 85%, were white and 11% were Hispanic. The majority were between the ages of 20-39 (85%), and 65% were college educated. Findings from the study contributed to the understanding of modifiable and nonmodifiable variables for breastfeeding in relation to geographic area. Those residing in the Western United States had higher reported rates of breastfeeding initiation at birth and duration of breastfeeding at 6 months. Participants in the WIC program had lower breastfeeding rates in all geographic regions except for the Northern United States. The HHS analyzed and used this data compiled to direct the breastfeeding target rates for HP 2010 (Ryan et al., 2004; USDHHS, 2000).

**National Immunization Survey (NIS).** In 1999, the CDC implemented a longitudinal study to track reported vaccination rates among toddlers 19 to 35 months of age. In response to the HP 2010 breastfeeding objectives, the survey added three breastfeeding questions. The NIS is a telephone survey that boasted a response rate of 75% but only averaged a sample size of 3400. The NIS did not capture real-time feeding practices; retrospective data was provided within a 3-year time period. Ethnic information was not collected. The most current data published, from 2006, included EBF data and revealed two important findings. First, percentages of newborn supplemented with formula during the first days of life have increased from 22% in 2003 to 26% in 2006. Second, breastfeeding initiation rates have increased to 74%; however, duration at 3 months was 43% and at 6 months was 22%, falling short of HP 2010 objectives. The HHS used this data to direct the proposed HP 2020 objectives (Li et al., 2005; HP 2020, 2009).

**National Health and Nutrition Examination Survey (NHANES).** The CDC used the longitudinal study, NHANES, to annually evaluate the nutritional status and overall health of the
United States population. Participants took part in face-to-face interviews conducted in their homes along with physical and dental examinations conducted in a mobile unit. Questions about breastfeeding were just a small component of the data collected. Total sample size was approximately 5000 annually, however, birth cohort sizes were relatively small and ranged from 369 to 2,040. This small component of the NHANES evaluated breastfeeding practices but did not differentiate EBF (CDC, 2009b). The percentage of breastfeeding infants reported increased from 69% in 1993-1994 to 77% in 2005-2006 ($p<.05$). Surprisingly, these findings surpassed one of the HP 2010 objectives. The results for breastfeeding duration at 6 months (35% of all women breastfeeding at 6 months) were not as encouraging. In 1999-2000, the NHANES used a formal, unidimensional acculturation tool that labeled Hispanic women as high or low acculturation. Low acculturated women had higher rates of breastfeeding (60%) than their highly acculturated counterparts (33%) (Gibson et al, 2005). In 2006, NHANES did not provide acculturation subgroup data; however, breastfeeding rates were higher for all Hispanic women (80%) compared with non-Hispanic whites (79%). In addition, Hispanic women came closer to meeting the HP 2010 objectives with a reported 6-month breastfeeding duration rate of 40%.

Results noted differences in maternal age compared with ethnicity. For example, Hispanic women under 29 years of age reported higher breastfeeding rates than non-Hispanic whites. All differences in ethnicity were significant ($p<.05$) (McDowell, Wang, & Kennedy-Stephenson, 2008).

**Infant Feeding Practices (IFP) studies.** The U.S. Food and Drug Administration (FDA) conducted the initial IFP study, the IFP-I, from 1992 to 1993. Over the next decade noteworthy modifications in infant formulas, legislation, and health education provided current information about infant feeding practices, and in collaboration with the CDC, directed the development of
the IFP-II. The IFP-II was conducted between 2005-2007. It examined two types of breastfeeding: EBF and breastfeeding with formula supplementation. Surveys mailed monthly collected information during the infant’s first year of life. Although over 500,000 surveys were mailed, the sample size varied by month and ranged from 449-1466 subjects. Similar to the RMS, the IFP captured real-time feeding practices (Fein, Labiner-Wolfe, Shealy, Chen, & Grummer-Strawn, 2008). The IFP-II findings were compared with those from the NIS. Breastfeeding initiation (85% vs. 74%), duration at 6 months (50% vs. 43%), and at 12 months (25% vs. 22%) were all reported higher in the IFP-II study (Shealy, Scanlon, Labiner-Wolfe, Fein, & Grummer-Strawn, 2008). Participant use of a breast pump was rare (5.6%) and produced breastfeeding durations of only one month. Only 38% of the participants were enrolled in a local Women, Infants, and Children (WIC) program. The majority of Hispanic women reported their cessation of breastfeeding was due to a perceived lack of milk production. Based on these findings, the authors concluded that misperceptions of perceived infant behaviors and mothers’ expectations had a causal relationship with breastfeeding cessation (Li, Fein, Chen, & Grummer-Strawn, 2008). Limitations of the IPF-II included its small representation of Hispanic women (7.3%) and its overrepresentation of White, English-speaking, higher socioeconomic women (84%) (Fein et al.).

**Other initiatives.** There are many initiatives that have been proposed and implemented to increase breastfeeding initiation and duration in the United States. The Baby-Friendly Hospital Initiative and the Women, Infants, and Children supplemental food programs are two initiatives that are used to promote breastfeeding.

**Baby-Friendly Hospital Initiative (BFHI).** In an effort to achieve HP 2010 objectives 16-19, a-c, the BFHI was introduced in 1991. This initiative adopted 10 practices outlined by the
United Nations Children’s Fund (UNICEF) and the World Health Organization (WHO) and set global standards for breastfeeding support in maternity centers worldwide. The term, *Baby-Friendly*, may be used only by those maternity facilities that have passed an external assessment and have met all 10 of the steps required according to the Global Criteria for the BFHI. The ten steps included written breastfeeding policies, continuous staff training and education, establishment of breastfeeding support groups, and encouragement of breastfeeding initiation within one half-hour after birth. BFHI centers do not accept free or low-cost formula. Since its inception, there are over 15,000 BFHI recognized facilities in 134 countries and BFHI centers have significantly increased EBF rates internationally (UNICEF, 2009). The higher rates of breastfeeding in Mexico, as reported in the NNNS-1999, were attributed to the BFHI initiated in that country (Gonzalez-Cossio et al., 2003). In 2000, there were 692 BFHI centers in Mexico, and only 25 in the United States. In 2009 there were 86 recognized BFHI centers in the United States (Bartick, Stuebe, Shealy, Walker & Grummer-Strawn, 2009; UNICEF).

In contrast, formula manufacturers spent over $46 million dollars in media advertising marketing to pregnant women and mothers of infants in 2004. Health statements touted by formula companies suggested that the use of their products improved infant gastrointestinal, brain, and eye health. In 2007-2008, there were 16 magazines geared for pregnant and new mothers. Nine of these magazines had ads for infant formula, and there were an average of 2.5 ads per issue. Over one-half of these ads contained health statements suggesting that the formula improved infant health (Stang, Hoss, & Story, 2010). The influence of formula lobbyists must be underscored (Bartick et al., 2009). In 2004, breastfeeding researchers released strong campaign ads aimed at convincing new mothers that failure to breastfeed posed critical infant health risks. In response, the Infant Formula Council (IFC) enlisted then AAP president, Dr.
Carden Johnson, to appeal to the HHS to diminish the tone of these ads. Through the persuasion of Dr. Johnson, the ads were stifled. Unfortunately, formula media ads influenced and continue to influence pregnant women and new mothers daily (Kaufman & Lee, 2007).

Women, Infants, and Children (WIC) initiative. The WIC program is a federally funded initiative established in 1969 that provides supplemental nutrition to low income pregnant and breastfeeding women, infants, and children. Individuals who are classified as 185% of the United States Poverty Guidelines, who demonstrate proof of state residency, and who are diagnosed nutritionally at-risk by a healthcare professional are eligible for this program (WIC, 2010). In 2009, WIC provided services to over 9 million individuals in the United States. The total program cost was $548 million, or approximately $42 per person monthly. Texas reported over 1 million participants, an increase of 9.9% from 2008 (Food and Nutrition Services [FNS], 2010).

Findings from the NIS and NHANES confirmed statistically lower breastfeeding initiation and duration rates among women who participated in WIC when compared with non-participants (CDC, 2009b; Li et al., 2005). Other studies verified that only 50-60% WIC participants initiated breastfeeding (McKechnie et al., 2009). Lee et al.(2009) determined that when low-income African American and Hispanic women participated in WIC, both had low breastfeeding initiation and duration rates as compared to the national averages. In addition, WIC recipients had higher reported rates of formula supplementation compared with women who did not participate in WIC. In face-to-face interviews with WIC participants, Holmes, Chin, Kaczorowski, and Howard (2009) asserted that women perceived WIC as a promoter of formula, not breastfeeding. The women did not identify WIC as a supporter of EBF.
Historically, WIC provided no cost formula to bottle and breastfed infants, possibly contributing to the participants low breastfeeding success (Holmes et al., 2009). In 2009, WIC implemented a revised food program. This revision placed restrictions on formula supplementation for breastfed infants. It also provided 24-hour breastfeeding support, face-to-face peer-counseling programs, as well as DVDs and on-line learning modules for breastfeeding education options. Culturally sensitive improvements were made in breastfeeding education based on evidence-based research. One example is the WIC Hispanic Breastfeeding and Promotion Project. This project targets breastfeeding education to the Hispanic mother, father, and grandparents (FNS, 2010). Bunik, Krebs, Beaty, McClatchy, and Olds (2009) posited newly adopted changes in the 2009 WIC food program better reflected the agency’s desire to increase breastfeeding rates among its participants. They also proposed that WIC participants who are referred to Nurse Family Partnership and similar programs had higher breastfeeding rates, and breastfeeding outcomes, possibly attributed to nurse accountability and support (FNS, 2009).

**Project Implementation**

**Project Objectives**

Three objectives were constructed to provide essential information that was needed to ultimately answer the research question. These objectives guided the researcher throughout the implementation of this project.

1. Identified a quantifiable level of acculturation for each Hispanic female participant.
2. Assessed infant feeding method at initial visit, 2-week visit and at 4-week follow-up.
3. Identified the correlation between acculturation and breastfeeding initiation and duration.
Timeline

The proposed timeline for this project was from July 2009 through April 2010. Data collection occurred from October 15, 2009 to January 31, 2010 (see Appendix B).

Methodology and Steps of Process

The steps taken to implement this project are explained in detail. First, a description of the sample criteria and the ARSMA-II presents an explanation of the project requirements. Second, a discussion of the data collection, resources, and supportive agencies describes the mechanics of this study.

Project requirements.

Sample criteria. The sample criteria included Hispanic postpartum women, 18 years or older, who delivered their infant at Texas Health Presbyterian Hospital Denton. The women were currently enrolled in state funded insurance plan and spoke English or Spanish. The newborn was enrolled as a patient at CCHC. Twins and premature infants were excluded. A total of 111 were offered participation in the study. None refused participation. A final total of 110 women completed the study at 1 month. A power analysis was calculated to determine the number of participants needed to obtain statistical significance. For this study, N=110, an alpha of .05, and a power of .8, yielded an effect size of .31 (2-tailed) (Burns & Grove, 2009).

The ARSMA-II. The ARSMA-II is a 5-point Likert scale, contains 30 open-ended statements, and is available in English and Spanish. The ARSMA-II is categorized at a 6.2 Flesch-Kinkaid grade level and has a 57.4 Flesch Reading Ease. The Cronbach’s coefficient alpha scores for individual scale reliability are 0.86 for the MOS and 0.88 for the AOS. Concurrent validity was established using the original ARSMA and resulted in a Pearson product moment correlation of 0.89 (Cuellar et al., 1995). Although the ARSMA-II has been utilized to
examine acculturation and prenatal health-promoting behaviors (Bond, Jones, Cason, Campbell, & Hall, 2002), alcohol use (Caetano, Ramisetty-Mikler, Wallish, McGrath, & Spence, 2008), depression rates (Cuellar, Bastida, & Braccio, 2004), health education programs (Schaefer, Salazar, Bruhn, Boushey, & VanLoan, 2009), and cardiovascular disease (Steffen, 2006), it has never been used to examine breastfeeding behaviors.

Influenced by the work of Berry (2003), Cuellar et al. (1995) recognized acculturation as a multidimensional concept and revised their original unidimensional ARSMA to the ARSMA-II. The ARSMA-II measured the behavioral, affective, and cognitive dimensions of the Hispanic individual. The scale used these three dimensions of acculturation to produce the Mexican orientation scale (MOS) and the Anglo orientation scale (AOS). The mean MOS was subtracted from the mean AOS, and a final score was obtained. The score from each individual was then incorporated into an orthogonal score based on Berry’s four typologies: Separation/Traditional, Marginalization/Low Bicultural, Integration/High Bicultural, and Assimilation. An orthogonal score was assigned to each participant (see Appendix C). The women categorized as Separation/Traditional were considered to have a low level of acculturation. The women categorized as Assimilation were considered to have a high level of acculturation.

Permission to make copies of the ARSMA-II was obtained per email communication with Dr. Bill Arnold on August 27, 2009. There was no monetary charge for the use of this tool. No changes or adaptations were made to the English or Spanish versions for this study.

**Mechanics of project.**

**Data collection.** The PNP and one full-time bilingual medical assistant (MA) facilitated the study at CCHC. The following steps were taken to implement this project.
1. Study participants came to CCHC for their infant’s appointment. All Hispanic women were asked to participate in the study. If they agreed to participate, the written statement, approved by the Texas Woman’s University (TWU) Institutional Review Board (IRB), was read out loud.

2. The women were placed into a private examination room with their infant. They were given a pen along with a demographic and ARSMA-II survey secured on a clipboard (see Appendix D). Women unable to read had the questionnaire and survey read to them by the MA. When the survey was completed, the women were thanked. All completed surveys were placed in a locked file cabinet at CCHC.

3. The women returned to CCHC for a 2-week appointment. The method of infant feeding was assessed and recorded in the space provided on the survey. The survey was returned to the locked file cabinet.

4. The women were contacted by phone at 4 weeks. The method of infant feeding was assessed and recorded in the space provided on the survey. The survey was returned to the locked file cabinet.

5. Final data were collected on January 31, 2010. Computer input of data began on February 1, 2010.

**Resources.** All paper and pens were provided by CCHC, and no additional funding was needed. The PNP managed the data entry and statistical analysis using the PASW Statistics GradPack 18.0©.

**IRB.** The appropriate steps were taken to protect the rights and welfare of human research participants. Protocols and related materials were designed in compliance with IRB standards. The mothers were reassured that participation in this study was voluntary and refusal to participate involved no penalty or loss of clinic benefits for their infant. Written approval to
conduct this study was obtained on October 13, 2009 from the Texas Woman’s University (TWU) IRB (see Appendix E).

**Supportive agencies.** The agencies that were supportive of this project were: TWU, Presbyterian Hospital of Denton, and the CCHC. The collaboration with these agencies enabled the DNP student to implement this study and to complete this study according to the projected time line.

**Results, Evaluation, and Discussion**

**Outcome Results**

**Data analysis.** Demographic data were analyzed using frequencies and descriptive statistics. Nominal data included the language of the survey, breastfeeding behaviors, formula offered at the hospital, WIC participation, breastfeeding initiation, and breastfeeding duration at 2 weeks and at 4 weeks. The education level of the mother was treated as categorical data and contained five education levels. Continuous data included the age of the mother, the length of United States residency, number of children, and the length of past breastfeeding. Ordinal data from the ARSMA-II and breastfeeding initiation and duration data at 2 weeks and 4 weeks were analyzed with the Spearman rank order correlation. Binary logistic regression was performed to assess the impact of orthogonal acculturation levels on breastfeeding initiation and duration results.

**Demographics.** The sample consisted of 110 Hispanic women. For over half of the participants, Spanish was the primary language spoken (55%), and 72% of the participants had immigrated to the United States from another country. The length of United States residency ranged from 2 months to 34 years. The mean length of residency was 12 years (S.D. 8.5). A small percentage of participants lived in the United States less than 12 months (6.4%), and only
10% of the participants reported residency less than 2 years. The average participant was 25 years of age (range, 18-40 years). The majority of the women reported that they completed high school (66.4%). Of the subjects who did not complete high school, 16.3% completed elementary school and 3.6% completed middle school. College graduates comprised 6.4%, and the remainder completed trade school (7.3%).

Thirty-nine percent of the women were primiparous. The remaining 61% reported having two to six children. Of the multiparous participants, 75% reported breastfeeding their other children for the duration of 1-24 months. Thirty-six percent of them reported breastfeeding between 1 and 6 months, however, the majority of these multiparous women reported breastfeeding 7-12 months (56%). Only 4% of the participants reported breastfeeding beyond 18 months. The majority of the women were offered formula while they were in the hospital (73%). Ninety percent reported that they participated in a local WIC program (see Tables F1- F2).

**Project Objectives Evaluation**

The data collected were used to evaluate the three project objectives.

1. Identified a quantifiable level of acculturation for each Hispanic female participant.

Orthogonal level scores from the ARSMA-II were calculated for each woman. The greatest numbers of participants were categorized at the lowest level of acculturation, Separation/Traditional (50%). Women categorized as mid-level acculturation were Marginalized/ Low Bicultural (15%) and Integration/High Bicultural (27%). Assimilation, the highest of the acculturated categories, had 8% of the participants (see Table F3).

2. Assessed infant feeding method at initial visit, 2 week visit and at 4 week follow-up. Of the 110 participants, 87% reported breastfeeding the newborns from birth. Of those breastfeeding subjects, 23% exclusively breastfed their infants. At the 2-week visit, rates of breastfeeding
decreased to 73%. At the 4 week follow-up, 66.4% of the participants still breastfed their infants. Concerning formula use, 13% were using formula exclusively at birth. At the 2 week visit, the percentage increased to 27%. At the 4 week follow-up, 33% of the total participants were using exclusive formula to feed their infants (see Figure F1).

3. Identified the correlation between acculturation and breastfeeding initiation and duration. The Spearman rank order coefficient was used to correlate the four orthogonal acculturation categories and breastfeeding initiation (see Table G1). The researcher did not find a significant relationship at alpha=.05. Spearman’s rho was calculated to investigate the correlation between the four orthogonal acculturation categories and breastfeeding duration. An alpha of 0.05 was used for 2 week and 4 week correlations. There was a weak, but significant, negative relationship between level of acculturation and breastfeeding duration at 2 weeks ($r_s=-.228$, $p<.05$). There was a moderate, negative relationship between acculturation and breastfeeding duration at 4 weeks ($r_s=-.304$, $p<.01$) (see Table F1). Binary logistic regression was then used to determine the predictor variables for breastfeeding duration. For this sample group, the age of the mother and education level were excluded because of no significance. Using the highest acculturated group, Assimilation, as the reference group, the strongest predictor of breastfeeding at 4 weeks was the lowest acculturated group, Separation/Traditional, recording an odds ratio of 6.0 (95% CI 1.44 to 25.00). This indicated that the odds of a women in the lowest acculturation group breastfeeding at 4 weeks were six times the odds of the reference group, based upon the sample size of 110 (see Table G2).
Data Evaluation and Rationale

The researcher analyzed the information from the three objectives. The data were then further analyzed to answer the research question.

Research Question. What effect did acculturation, as measured by the ARSMA-II, have on breastfeeding initiation and duration in Hispanic women? The study showed no statistical significance between acculturation and breastfeeding initiation. There was a weak, significant, negative relationship between acculturation and breastfeeding duration at 2 weeks ($r_s=-.228$, $p<.05$). There was a moderate, significant, negative relationship between acculturation and breastfeeding duration at 4 weeks ($r_s=-.304$, $p<.01$).

Hypotheses.

$H_{O1}$: There was no relationship between decreasing levels of acculturation and breastfeeding initiation in Hispanic women. Based on the research findings, the researcher failed to reject the null hypothesis of significant correlation.

$H_{A1}$: Decreasing levels of acculturation negatively affected breastfeeding initiation in Hispanic women. Based on the research findings, the researcher failed to accept this alternative hypothesis.

$H_{O2}$: There was no relationship between decreasing levels of acculturation and breastfeeding duration at 2 weeks in Hispanic women. Based on the research findings, the researcher failed to accept this null hypothesis.

$H_{A2}$: Decreasing levels of acculturation affected breastfeeding duration at 2 weeks in Hispanic women. The researcher failed to reject this alternative hypothesis based on the statistical significance at 2 weeks ($r_s=-.228$, $p<.05$).
H₀₃: There was no relationship between decreasing levels of acculturation and breastfeeding duration at 4 weeks in Hispanic women. Based on the research findings, the researcher failed to accept this null hypothesis.

Hₐ₃: Decreasing levels of acculturation affected breastfeeding duration at 4 weeks in Hispanic women. The researcher failed to reject this alternative hypothesis based on the statistical significance at 4 weeks (rₛ = -0.304, p < .01). The strongest predictor of breastfeeding duration at 4 weeks was in women categorized in the lowest acculturation group, Separation/Traditional.

**Discussion**

**Discussion of study findings.** This study was comprised of Hispanic women from a metropolitan, medically underserved county in Texas. The majority of the participants were young, multiparous, and high school graduates. Of all the participants, forty-five percent reported previously breastfeeding their other children, and over half of those studied reported breastfeeding durations longer than 6 months. Because this study used shorter duration rate time-periods than most other studies, comparison was difficult; however, breastfeeding initiation rate was easily comparable. Breastfeeding initiation rates from this study (87%) surpassed the HP 2010 objective goal (75%). These breastfeeding initiation rates were also higher than reported national findings from the NIS, NHANES, and the IFP-II (see Appendix A and Table F1). Exclusive breastfeeding rates in this study were 20%, which was markedly lower than the projected HP2010 goal for EBF at 3 months (40%). This study sample also had lower rates of breastfeeding initiation as compared with women in Mexico (92%). Although breastfeeding duration rates for 2 weeks and 4 weeks were not reported in the NIS, NHANES, and the IFP-II, rates from this study were promising. Hopkinson and Gallager (2009) noted that women who
were breastfeeding at 4 weeks were more likely to continue breastfeeding through 4 months. Lee et al (2009) noted, however, that other variables such as WIC participation, low SES, and relationship status with the infant’s father predicted earlier weaning.

There were noted benefits for using the ARSMA-II tool for this study. This was the first breastfeeding study that measured acculturation as a multidimensional construct. In many studies conducted on Hispanic women and breastfeeding, proxy measures, such as immigration status or primary language spoken are used to differentiate high and low acculturation. In this particular study, these measures would have produced different population parameters for acculturation as compared with the ARSMA-II results. For example, if immigration status had been used to measure acculturation, then 72% of this population would have been classified as low acculturation. If the primary language spoken had been used as the measure of acculturation in this study, 45% of the women spoke English and would be labeled as high acculturation and the 55% that spoke Spanish would have been labeled as low acculturation. Through the use of the ARSMA-II, the orthogonal levels incorporate subtle values and beliefs that influence the breastfeeding behaviors of the Hispanic women. Determining the values, attitudes, and cultural identification with the country of origin were important components that must be included in the development and implementation of breastfeeding teaching and resources for the Hispanic woman.

Acculturation had a relationship with breastfeeding duration. However, when considering the HPM, acculturation is just one component that influences this health promoting behavior. The role of acculturation, according to the HPM, is part of the process and is not completely responsible for its success or failure. Other determinants, or components, also play an active role. The woman’s accessibility to formula and postpartum contact with a healthcare
provider affects breastfeeding decisions. Gorman et al. (2007) asserted that the time period between the birth of the infant and 2 weeks was crucial in determining breastfeeding initiation and duration. The researchers determined that two positive predictors of increased breastfeeding duration were the decision of the mother to EBF and a face-to-face encounter with a healthcare provider at 2 weeks. Holmes et al. (2009) noted the outside influence of formula use impacted breastfeeding decisions. Maternal self-efficacy affected breastfeeding initiation and duration (Nichols et al., 2009). This study assessed EBF initiation, formula use, as well as provided a face-to-face encounter for each mother at 2-weeks. Limited research exists between these additional influencing components and the acculturation level of the Hispanic woman.

**Strengths and limitations.** Although this study demonstrated significant results, caution should be taken when generalizing this information to other populations. There were several limitations of this study. First, the study was comprised of a sample of convenience. The participants over-represented the number of Hispanics living in this particular community. In addition, all of the participants were low SES, based on their use of a state-funded insurance plan. Secondly, the study was short in duration. Extending the study for a 6 month duration would produce more accurate findings of breastfeeding durations. Finally, this study excluded other breastfeeding variables. This study had many strengths, one of which, was its large sample size. The use of a validated acculturation tool also provides opportunities for future research with the ARSMA-II and breastfeeding. There was no monetary fee for the use of the acculturation tool, which made it affordable for the researcher. These strengths make this study replicable for other researchers in other demographic and socioeconomic settings.

**Future studies.** This study generated many implications for prospective studies. Researchers should consider the use of a multidimensional tool, such as the ARSMA-II, for the
qualitative measurement of acculturation instead of proxy measures (Thomson & Hoffman-Goetz, 2009). Replicating previous breastfeeding studies with the use of a tool will strengthen the findings and provide depth to what is known about acculturation. Future studies could examine Hispanic women from other geographic and socioeconomic levels, employment status, and breastfeeding duration past one month. The inclusion of other variables, such as the role of the infant’s father, peer and familial support, and the mother’s perception of infant feeding, are other areas that would provide further knowledge about this subject. Further research is needed to determine the effects of these variables and the acculturation level of the Hispanic woman with breastfeeding behaviors (Gorman et al., 2007; Thomson & Hoffman-Goetz).

**Implications for practice.** The findings from this study provide many opportunities for the DNP in clinical practice, in the community, and in the legislative arena. By quantifying acculturation into orthogonal categories, the DNP will better understand the values, beliefs, and the cultural traditions that are significant for Hispanic women. This information will then enable the DNP to develop culturally sensitive education, provide culturally competent healthcare, and help this population meet the HP2020 breastfeeding objectives.

**Clinical practice.** The DNP can use these findings to view each Hispanic woman as an individual. When the DNP encounters a Hispanic woman that has immigrated to the United States, or uses Spanish as her primary language, the DNP understands that this woman also has a Hispanic heritage that extends past her language or origin of birth. Depending upon the level of acculturation, breastfeeding ideations may be different than the DNP assumes. The DNP can question the woman as to her breastfeeding beliefs and traditions. Using this approach, the DNP will better educate and provide individualized care for each Hispanic infant and mother.
Community influence. The CDC has recommended the identification of successful breastfeeding programs, especially programs targeting low-income and minority groups (USDHHS, 2007b). Hispanic women with higher levels of acculturation may require different breastfeeding education and support than those women who have lower acculturation levels. Through the use of these findings, the DNP is in an optimal position to participate in the development and implementation of culturally competent breastfeeding programs. These programs may involve state funded programs, such as WIC, or they may be hospital-based. The DNP can use every opportunity to encourage the cultural awareness of other healthcare providers when they educate Hispanic women about breastfeeding. Moreover, the DNP can effectively evaluate the effectiveness and appropriateness of the newly implemented WIC breastfeeding initiatives in relation to increased breastfeeding initiation and duration rates in Hispanic women.

Legislative arena. The DNP can take an active role in health promoting behaviors for Hispanic breastfeeding women. Legislators may not recognize that multiple determinants influence health-promoting behaviors (Pender et al., 2005). The DNP can educate lawmakers about the importance of including personal factors, such as acculturation, when allocating funds for programs earmarked for Hispanic groups. The DNP can be an active voice for these women by promoting and guiding federally funded breastfeeding research that is culturally sensitive to Hispanic women. In addition, the DNP must become familiar with legislation and policies that promote the use of formula in state and local hospitals. By actively pursuing hospitals in the United States to achieve BFHI status, the DNP will promote breastfeeding for all women in the United States.
Conclusion

Hispanic individuals who live in the United States have greater reported health disparities, such as obesity and diabetes, when compared with white, non-Hispanic individuals. Breastfeeding is one way that a Hispanic woman can promote the health of her infant and help narrow this gap. Encouraging Hispanic women to initiate and continue breastfeeding for at least six months duration promotes the health of their children. Incorporating the woman’s level of acculturation when providing health education may contribute to breastfeeding duration rates. A modest increase in breastfeeding duration will contribute to the prevention of health disparities in the next generation of Hispanics living in the United States.
References


RELATIONSHIP OF ACCULTURATION WITH BREASTFEEDING


Steffen, P.R. (2006). The cultural gradient: Culture moderates the relationship between socioeconomic status (SES) and ambulatory blood pressure. *Journal of Behavioral Medicine, 29*(6), 501-510.


Appendix A

HP 2010 Objectives and Longitudinal Study Comparisons of Breastfeeding Initiation & Duration Rates

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation</td>
<td>75</td>
<td>66</td>
<td>74</td>
<td>79</td>
<td>85</td>
<td>92</td>
</tr>
<tr>
<td>Duration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2-month</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-month</td>
<td></td>
<td></td>
<td>43</td>
<td>50</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>6-month</td>
<td><strong>50</strong></td>
<td>28</td>
<td>22</td>
<td>35</td>
<td>25</td>
<td>55</td>
</tr>
<tr>
<td>12-month</td>
<td><strong>25</strong></td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>3-month</td>
<td>6-month</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
<td>---------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EBF</td>
<td>40</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breastfeeding Findings (%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-month</td>
<td>33</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-month</td>
<td>26</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Appendix B

Timeline of Project Phases

<table>
<thead>
<tr>
<th>Date</th>
<th>Phase</th>
<th>Task</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>July-Aug 2009</td>
<td>1</td>
<td>Project Outline Proposed</td>
<td>July 19, 2009</td>
</tr>
<tr>
<td>Aug 2009</td>
<td>1</td>
<td>Concept Presentation</td>
<td>Aug 8, 2009</td>
</tr>
<tr>
<td>Aug 2009</td>
<td>1</td>
<td>Obtain ASRMA-II (permission SAGE)</td>
<td>Aug 27, 2009</td>
</tr>
<tr>
<td>Sept 2009</td>
<td>2</td>
<td>Project Proposal/Committee Approval</td>
<td>Sept 21, 2009</td>
</tr>
<tr>
<td>Sept 2009</td>
<td>2</td>
<td>Complete IRB application and submit for</td>
<td>Oct 1, 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10/14/09 IRB meeting</td>
<td></td>
</tr>
<tr>
<td>Sept 2009</td>
<td>2</td>
<td>Assemble questionnaire (consent,</td>
<td>Sept 22, 2009</td>
</tr>
<tr>
<td></td>
<td></td>
<td>demographic data &amp; ASRMA-II questions)</td>
<td></td>
</tr>
<tr>
<td>Oct 2009-</td>
<td>3</td>
<td>Data collection: Initial visit, 2 week</td>
<td>Oct 15, 2009-</td>
</tr>
<tr>
<td>Jan 2010</td>
<td></td>
<td>visit, and 4 week phone follow-up</td>
<td>Jan 31, 2009</td>
</tr>
<tr>
<td>Feb 2010</td>
<td>4</td>
<td>Compile and analyze data</td>
<td>Feb 28, 2010</td>
</tr>
<tr>
<td>Feb 2010</td>
<td>4</td>
<td>Interpret and analyze findings</td>
<td>Feb 28, 2010</td>
</tr>
<tr>
<td>Mar 2010</td>
<td>5</td>
<td>Capstone Oral Defense</td>
<td>Mar 29, 2010</td>
</tr>
</tbody>
</table>


Appendix C

ARSMA-II Orthogonal Scoring

The orthogonal category was obtained by finding the MOS and AOS that best matched one of the four orthogonal scores. The participant was then assigned an acculturation level based on the orthogonal classification.

<table>
<thead>
<tr>
<th>Orthogonal Category</th>
<th>Orthogonal Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separation</td>
<td>MOS =&gt; 3.7; AOS &lt;= 3.24</td>
</tr>
<tr>
<td>Marginalized</td>
<td>MOS &lt; 3.59; AOS &lt; 3.7</td>
</tr>
<tr>
<td>Integration</td>
<td>MOS &gt; 3.59; AOS &gt; 3.7</td>
</tr>
<tr>
<td>Assimilated</td>
<td>MOS &lt;= 2.44; AOS &gt;= 4.11</td>
</tr>
</tbody>
</table>

©1995, Cuéllar, Arnold & Maldonado
Appendix D
Demographic and ARSMA-II Tool (English)

Your participation in the survey serves as your consent to participate in this study.

Date: _____________________________
Age (in years): _______________
Length of time in U.S.: _______________ months
  _______________ years
  _______________ born in U.S.

How are you feeding your newborn: ______ breastfeeding only
  ______ breastfeeding and formula
  ______ formula only

How many children do you have? ___________

Have you breastfed your other children? Yes   No
  If you answered yes, how long did you breast feed?
    ____________ weeks  (or)
    ____________ months  (or)
    ____________ years

Did the nurses give you formula before leaving the hospital? Yes   No

Do you participate in a Women’s Infants and Children (WIC) program? Yes   No

What is your highest level of education:   _____Elementary School   _____Middle School
   _____High School   _____Trade School   _____College degree

Follow-up breastfeeding:
  2-week:   Yes   No   F or P
  4-week:   Yes   No   F or P
(5) Almost Always/Extremely Often  
(4) Much/Very Often  
(3) Moderately  
(2) Very Little/Not very Much  
(1) Not at all

1. I speak Spanish................................. (1) (2) (3) (4) (5)  
2. I speak English................................. (1) (2) (3) (4) (5)  
3. I enjoy speaking Spanish............... (1) (2) (3) (4) (5)  
4. I associate with Anglos................... (1) (2) (3) (4) (5)  
5. I associate with Mexicans and/or Mexican American ....................... (1) (2) (3) (4) (5)  
6. I enjoy Spanish language music .................. (1) (2) (3) (4) (5)  
7. I enjoy listening to English language music .................. (1) (2) (3) (4) (5)  
8. I enjoy Spanish language TV ................ (1) (2) (3) (4) (5)  
9. I enjoy English language TV ............. (1) (2) (3) (4) (5)  
10. I enjoy English language movies ........... (1) (2) (3) (4) (5)  
11. I enjoy Spanish language movies .......... (1) (2) (3) (4) (5)  
12. I enjoy reading books in Spanish .......... (1) (2) (3) (4) (5)  
13. I enjoy reading books in English .......... (1) (2) (3) (4) (5)
(5) Almost Always/Extremely Often
(4) Much/Very Often
(3) Moderately
(2) Very Little/Not very Much
(1) Not at all

14. I write letters in Spanish…………………..…   (1) (2) (3) (4) (5)
15. I write letters in English ……………………   (1) (2) (3) (4) (5)
16. My thinking is done in the English language………………………………………   (1) (2) (3) (4) (5)
17. My thinking is done in the Spanish language………………………………………   (1) (2) (3) (4) (5)
18. My contact with Mexico has been……………  (1) (2) (3) (4) (5)
19. My contact with the USA has been…………..   (1) (2) (3) (4) (5)
20. My father identifies or identified himself as “Mexicano”…………………………..   (1) (2) (3) (4) (5)
21. My mother identifies or identified herself as “Mexicana’……………………………..…   (1) (2) (3) (4) (5)
22. My friends while I was growing up were of Mexican origin ………………………..   (1) (2) (3) (4) (5)
23. My friends while I was growing up were of Anglo origin ………………………………   (1) (2) (3) (4) (5)
24. My family cooks Mexican foods ……………..   (1) (2) (3) (4) (5)
(5) Almost Always/Extremely Often
(4) Much/Very Often
(3) Moderately
(2) Very Little/Not very Much
(1) Not at all

25. My friends now are of Anglo origin……….. (1) (2) (3) (4) (5)
26. My friends now are of Mexican origin………… (1) (2) (3) (4) (5)
27. I like to identify myself as an Anglo American……………………………………………… (1) (2) (3) (4) (5)
28. I like to identify myself as Mexican American……………………………………………… (1) (2) (3) (4) (5)
29. I like to identify myself as Mexican……………… (1) (2) (3) (4) (5)
30. I like to identify myself as American ………….. (1) (2) (3) (4) (5)

©1995, Cuéllar, Arnold & Maldonado
Demográfica y ARSMA-II Instrumento

La participación en esta inspección servirá como mi consentimiento al participar en este estudio.

Fecha:__________________________________
Edad (en años): _____________
Tiempo aquí en las Estados Unidos:

________ meses
________ años
________ nacido en Estados Unidos

Como alimenta su niños/niñas: __________ la de pecho solamente

________ las dos (pecho y formula)

________ formula solamente

Cuántos niños tiene: __________

Les dio pecho las otros niños/niñas: Si No

Si contesto, “Sí”, cuánto tiempo pecho: __________ semanas (o)

________ meses (o)

________ años

Recibió la formula en el hospital: Si No

Participa in la programa de WIC (Mujeres, Infantes y Niños): Si No

Nivel educación más alto:

________ la escuela primaria

________ la escuela media

________ escuela secundaria

________ escuela de comercio

________ universidad

<table>
<thead>
<tr>
<th>Follow-up breastfeeding:</th>
<th>2-week:</th>
<th>Yes</th>
<th>No</th>
<th>F or P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4-week:</td>
<td>Yes</td>
<td>No</td>
<td>F or P</td>
</tr>
</tbody>
</table>


ARSMA-II-Scala 1

(5) Muchísimo o casi todo el tiempo
(4) Mucho o muy frecuente
(3) Moderado
(2) Un poquito o a veces
(1) Nada

1. Yo hablo Español……………………………… (1) (2) (3) (4) (5)
2. Yo hablo Inglés………………………………… (1) (2) (3) (4) (5)
3. Me gusta hablar en Español…………………… (1) (2) (3) (4) (5)
4. Me asocio con Anglos………………………… (1) (2) (3) (4) (5)
5. Me asocio con Mexicanos o con Norte Americanos…………………………………… (1) (2) (3) (4) (5)
6. Me gusta la musica Mexicana (musica en idioma Español …………………………………… (1) (2) (3) (4) (5)
7. Me gusta la musica de idioma Ingles……….. (1) (2) (3) (4) (5)
8. Me gusta ver programas en la televisión que sean en Español………………………… (1) (2) (3) (4) (5)
9. Me gusta ver programas en la televisión que sean en Inglés ……………………………… (1) (2) (3) (4) (5)
10. Me gusta ver películas en Español………… (1) (2) (3) (4) (5)
11. Me gusta ver películas en Inglés. ………… (1) (2) (3) (4) (5)
12. Me gusta leer en Español…………………… (1) (2) (3) (4) (5)
13. Me gusta leer en Inglés………………………… (1) (2) (3) (4) (5)
<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14.</td>
<td>Escribo (como cartas) en Español</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>15.</td>
<td>Escribo (como cartas) en Inglés</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>16.</td>
<td>Mis pensamientos ocurren en el idioma Inglés</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>17.</td>
<td>Mis pensamientos ocurren en el idioma Español</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>18.</td>
<td>Mi contacto con Mexico ha sido</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>19.</td>
<td>Mi contacto con Estados Unidos ha sido</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>20.</td>
<td>MI padre se identifica (o se identificaba) como Mexicano</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>21.</td>
<td>Mi madre se identifica (o se identificaba) como Mexicana</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>22.</td>
<td>Mis amigos(as) de mi niñez eran de origen Mexicano</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>23.</td>
<td>Mis amigos(as) de mi niñez eran de origen Anglo Americano</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
<tr>
<td>24.</td>
<td>Mi familia cocina comidas Mexicanas</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
</tr>
</tbody>
</table>
(5) Muchísimo o casi todo el tiempo
(4) Mucho o muy frecuente
(3) Moderado
(2) Un poquito o a veces
(1) Nada

25. Mis amigos(as) recientes son Anglo Americanos................................. (1) (2) (3) (4) (5)
26. Mis amigos(as) recientes son Mexicanos...... (1) (2) (3) (4) (5)
27. Me gusta identificar me como Anglo Americano........................................... (1) (2) (3) (4) (5)
28. Me gusta identificar me como Mexico Americano o Norte Americano.............. (1) (2) (3) (4) (5)
29. Me gusta identificar me com Mexicano....... (1) (2) (3) (4) (5)
30. Me gusta identificar me como un(a) Americano(a)........................................... (1) (2) (3) (4) (5)

©1995, Cuéllar, Arnold & Maldonado
October 13, 2009

Ms. Robin Henson

1121 Raleigh Path Road
Denton, TX 76208

Dear Ms. Henson:

Re: The Relationship of Acculturation with Breastfeeding Initiation and Duration in Hispanic Women.

Your application to the IRB has been reviewed and was approved on____. This approval is valid for one (1) year. The study may not continue after the approval period without additional IRB review and approval for continuation. It is your responsibility to assure that this study is not conducted beyond the expiration date.

Any changes in the study or informed consent procedure must receive review and approval prior to implementation unless the change is necessary for the safety of subjects. In addition, you must inform the IRB of adverse events encountered during the study or of any new and significant information that may impact a research participant's safety or willingness to continue in your study.

Remember to provide copies of the signed informed consent to me at the Presbyterian campus when the study has been completed. Include a letter providing the name(s) of the researcher(s), the faculty advisor, and the title of the study. Upon receipt of these consent forms the committee will issue a statement ending its involvement with this project. Graduation may be blocked unless consents are returned.

The Institutional Review Board is pleased to acknowledge your sense of responsibility for ethical research. If you have any questions concerning this review, please contact me at (214) 706-2461 or email SLin@twu.edu.

Sincerely,

[Signature]

Dr. Suh-Jen Lin, Chair

cc. Dr. Stephanie Woods, College of Nursing - Dallas
Dr. Susan Chaney, College of Nursing - Dallas
Graduate School
Appendix F

Sample Demographic Results

Sample Results: Demographic Data

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Sample demographics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Language of Survey</td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>45</td>
</tr>
<tr>
<td>Spanish</td>
<td>55</td>
</tr>
<tr>
<td>Born in the U.S.</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>28</td>
</tr>
<tr>
<td>No</td>
<td>72</td>
</tr>
<tr>
<td>Highest Education Completed</td>
<td></td>
</tr>
<tr>
<td>Elementary</td>
<td>16.3</td>
</tr>
<tr>
<td>Middle/Junior High</td>
<td>3.6</td>
</tr>
<tr>
<td>High School</td>
<td>66.4</td>
</tr>
<tr>
<td>Trade</td>
<td>7.3</td>
</tr>
<tr>
<td>College</td>
<td>6.4</td>
</tr>
</tbody>
</table>
### Relationship of Acculturation with Breastfeeding

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Sample demographics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
</tr>
<tr>
<td><strong>Number of Children</strong></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>39.1</td>
</tr>
<tr>
<td>2</td>
<td>28.2</td>
</tr>
<tr>
<td>3</td>
<td>20.9</td>
</tr>
<tr>
<td>4</td>
<td>5.5</td>
</tr>
<tr>
<td>5</td>
<td>5.5</td>
</tr>
<tr>
<td>6</td>
<td>.9</td>
</tr>
<tr>
<td><strong>Past Breastfeeding</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>74.6</td>
</tr>
<tr>
<td>No</td>
<td>25.4</td>
</tr>
<tr>
<td><strong>Length of Past Breastfeeding</strong></td>
<td></td>
</tr>
<tr>
<td>1-6 months</td>
<td>36</td>
</tr>
<tr>
<td>7-12 months</td>
<td>56</td>
</tr>
<tr>
<td>13-18 months</td>
<td>4</td>
</tr>
<tr>
<td>19-24 months</td>
<td>4</td>
</tr>
</tbody>
</table>
## Relationship of Acculturation with Breastfeeding

### Characteristics

<table>
<thead>
<tr>
<th>Sample demographics</th>
<th>Percentage</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Formula</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>72.7</td>
<td>80</td>
</tr>
<tr>
<td>No</td>
<td>27.3</td>
<td>30</td>
</tr>
<tr>
<td>WIC participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>81.8</td>
<td>90</td>
</tr>
<tr>
<td>No</td>
<td>18.2</td>
<td>20</td>
</tr>
</tbody>
</table>

### Table 2

*Past Breastfeeding Behaviors (N=67)*

<table>
<thead>
<tr>
<th>Other Children</th>
<th>Percentage</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past Breastfeeding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>75</td>
<td>50</td>
</tr>
<tr>
<td>No</td>
<td>25</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>67</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length of Breastfeeding</th>
<th>Percentage</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-6 months</td>
<td>36</td>
<td>18</td>
</tr>
<tr>
<td>7-12 months</td>
<td>56</td>
<td>28</td>
</tr>
<tr>
<td>13-18 months</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>19-24 months</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>
Table 3

ARSMA-II Orthogonal Levels

<table>
<thead>
<tr>
<th>Orthogonal Level</th>
<th>%</th>
<th>Sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separation/Traditional</td>
<td>50.9</td>
<td>56</td>
</tr>
<tr>
<td>Marginalized/Low Bicultural</td>
<td>12.7</td>
<td>14</td>
</tr>
<tr>
<td>Integration/High Bicultural</td>
<td>27.3</td>
<td>30</td>
</tr>
<tr>
<td>Assimilation</td>
<td>9.1</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td>110</td>
</tr>
</tbody>
</table>

*Figure 1.* Breastfeeding and formula feeding percentages of study participants at the initial visit, 2 week visit, and 4 week follow-up.
Appendix G
Correlation Results: Acculturation with Breastfeeding Duration and Initiation Rates

Table 1

<table>
<thead>
<tr>
<th>Correlation Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breastfeeding</td>
</tr>
<tr>
<td>At birth</td>
</tr>
<tr>
<td>Correlation Coefficient</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation Coefficient</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>4 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation Coefficient</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)
Table 2

Orthogonal Levels and Breastfeeding Duration 4 weeks: Binary Logistic Regression

<table>
<thead>
<tr>
<th>Variables in the equation</th>
<th>Sig.</th>
<th>Exp(B)</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assimilation</td>
<td>.019</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separation/Traditional</td>
<td>.014</td>
<td>6.000</td>
<td>1.440</td>
<td>25.004</td>
</tr>
<tr>
<td>Marginalized/Low Bicultural</td>
<td>.423</td>
<td>1.929</td>
<td>.387</td>
<td>9.601</td>
</tr>
<tr>
<td>Integration/High Bicultural</td>
<td>.468</td>
<td>1.714</td>
<td>.400</td>
<td>7.340</td>
</tr>
<tr>
<td>Constant</td>
<td>.530</td>
<td>.667</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Variables entered on Step 1: Orthogonal/4weekMeasurement