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# Socioecological Determinants of Obesity Among Hispanic Parents/Child Caregivers in Aurora, Illinois

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Abstract

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MSN Wayne State University, 1998

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Dissertation Submitted in Partial Fulfillment

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Abstract

Obesity has increased during the past 30 years in the United States. Obese adults and children are at risk for cardiovascular disease, diabetes, hypertension, and comorbidities. Parents and child caregivers play key roles in the decisions of family health. Studies exploring sociodemographic and socioecological factors associated with obesity among U.S. Hispanic parents and child caregivers are lacking. Guided by the socioecological model, this study examined the following factors: gender; acculturation; dietary intake of fat, sugar, fruits, and vegetables; and role as food purchaser/food preparer that influenced obesity. A 3-paper-based survey, consisting of a demographic survey, the Block Fat-Sugar-Fruit-Vegetable Screener and the Bidimensional Acculturation Scale for Hispanics (BAS), was used to collect data. The volunteer sample of 165 Hispanic parents/child caregivers residing in Aurora, Illinois, was recruited using venue-based sampling. Point-biserial correlations, chi-square, and multiple logistic regression were performed to test 10 hypotheses. Acculturation, as measured by the BAS non-Hispanic domain scores, was a significant predictor of obesity. Obesity increased 1.737 times with every 1 unit increase in acculturation BAS non-Hispanic domain scores. Multiple regression results showed that developing obesity was 2.46 times lower in males compared with females in the overall sample. These findings could be used to promote positive social change by influencing the development of culturally congruent obesity prevention, management, and treatment programs produced by educators and health professionals specifically targeting obesity among Hispanic women, which could further increase the overall well-being and longevity of Hispanic families in Aurora, Illinois, and beyond.

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# Dedication

This study is dedicated to my father, Arthur Collins, who battled a lifetime of challenges related to obesity, and to my children, Jonathan, Serena, and Jason Collins Sommers, who are role models of healthy choices.

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The research in this dissertation could not have come to fruition without the support from the Walden community: Dr. Peterson for mentoring me until the end, and Dr. Early for support and positive encouragement. I am grateful to Dr. Gonzalez for his methodological guidance, to Dr. Brown as the University Research Reviewer, and to Dr. Crosslin and Dr. Kilmer for your time and input in this long journey. A very special thanks and deep appreciation to Dr. Moultrie and Betsy Goolsby for their untiring commitment and personal guidance through this process.

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# Chapter 1: Introduction to the Study

Globally, obesity has reached pandemic proportions. More than 1.9 billion adults are overweight, and more than 600 million adults are clinically obese (World Health Organization [WHO], 2015). These numbers have more than doubled in the last 3 decades (WHO, 2015). Worldwide, approximately 78% of the population is overweight (WHO, 2015). Obesity is a contributor to chronic diseases and disabilities, and it kills more people than starvation or malnutrition (WHO, 2015). Obesity is linked to cardiovascular disease, hypertension, stroke, cancer, diabetes, and premature death; it causes approximately 3 million deaths worldwide every year (Centers for Disease Control and Prevention [CDC], 2016; WHO, 2015). In addition, adult obesity is associated with reduced quality of life, social stigmatization, and discrimination (CDC, 2011a). This preventable pandemic affects families from all age groups, regions, education levels, and financial and cultural backgrounds.

In this chapter, I introduce the study topic and provide an overview of the study. The first section contains a summary of recent literature relating to obesity within the United States and provides a background for the problem that I addressed in this study. After presenting the study purpose, the research questions, and the study's associated hypothesis, the next section contains an introduction of the socioecological model (SEM) and how it may be applied to the public health issue of obesity. The following section contains the definitions and assumptions, the study scope, and delimitations and limitations. Last, I describe the significance of this research study in advancing public health knowledge and contributing to positive social change.

## Background of the Problem

The occurrence of obesity during adulthood or childhood is detrimental to an individual's health. Obese adults, adolescents, and children are more prone to suffering from life-threatening conditions such as type 2 diabetes, hypertension, and hypercholesterolemia (Butte, Cai, Cole, & Comuzzie, 2006; CDC, 2015b; Fennoy, 2010; Hossain, Kawar, & El Nahas, 2007; National Hispanic Caucus of State Legislators [NHCSL] Hispanic Obesity Initiative, 2010). In adults, excessive body weight has been linked to several other comorbidities, including cardiovascular disease, depression, infertility, breast cancer, endometrial cancer, colon cancer, prostate cancer, and stroke (Wong & Leatherdale, 2009). These comorbidities have been estimated to result in more than 300,000 excess deaths per year (CDC, 2009). More than 27 million Americans have chronic heart disease, 25 million have type 2 diabetes, 50 million have arthritis, and 68 million have hypertension (Robert Wood Johnson Foundation Center to Prevent Childhood Obesity [RWJF], 2012). Further, nearly 800,000 Americans suffer a stroke annually, and approximately 190,650, or one in three, deaths from cancer each year can be traced to physical inactivity, poor nutrition, or obesity (Trust for America's Health [TFAH] & RWJF, 2013). Moreover, obesity can also negatively influence self-esteem, social development, and academic achievement (Hassink, 2007).

## Obesity in the United States

From 1990 to 2010, obesity increased among adults and children in the United States (Ogden & Carroll, 2010; RWJF, 2010). Among adults ages 20 to 74 years, more than 78 million (35.7% of the U.S. population) are obese (Ogden, Carroll, Kit, & Flegal, 2010).

In addition, 34.2% of adults in the same age range are overweight, and 5.7% are morbidly obese (CDC, 2010a; Ogden & Carroll, 2010). Further, nearly one-third of all children and adolescents in the United States are overweight or obese (CDC, 2010a; Ogden & Carroll, 2010). This increase in the incidence of obesity and overweight in adults in the United States places future generations at risk for cardiovascular disease, diabetes, hypertension, dyslipidemia, obstructive sleep apnea, nonalcoholic steatohepatitis, and other health problems. The rising rates of obesity have led to increased morbidity and mortality and shortened projected longevity for children and adolescents, who now can expect to have shorter lifespans than their parents or family members from past generations (Berry, Turner, Biederman, & Flanagan, 2009; Braveman, Cubbin, Egerter, Williams, & Pamuk, 2010). Obesity can be prevented and reversed with attention to modifiable risk factors (Braveman et al., 2010; Poobalan, Taylor, Clar, Helms, & Smith, 2008; Savage, Fisher, & Birch, 2007; Sussner, Lindsay, Greaney, & Peterson, 2008; Washington, 2008).

## Obesity Among Hispanic Americans

Obesity disproportionately affects minority populations in the United States. The highest age-adjusted rates of obesity belong to African Americans, at 49.5%. This figure compares with Mexican Americans at 40.4%, all Hispanic Americans at 39.1%, and European Americans at 34.3% (CDC, 2012). Obesity rates among Hispanic populations in the United States have risen significantly during the last 2 decades (CDC, 2015g). The Hispanic populations has migrated from various locations, including Central and South America, Mexico, Cuba, and Puerto Rico. Hispanics residing in the United States have diverse origins with a multitude of cultural backgrounds. Although most Hispanic/Latino groups have Spanish as a common language, other cultural characteristics, especially those involving food, are unique to certain countries and even to local regions in those countries. The same food may be consumed in different countries, but the methods of preparation and the way the food is integrated into eating patterns vary from place to place (Kittler & Sucher, 2012). Obesity in Hispanic populations is shaped by multiple factors, including biopsychological and ecological factors that may influence diet and physical activity (Obayashi, Bianchi, & Song, 2003; Richards, Riner, & Sands, 2008; Robinson, 2008; Teran, Belkic, & Johnson, 2002).

**Obesity in Illinois**

Although obesity is a problem throughout the United States, prevalence varies by region. Illinois is ranked the 23rd most obese among the 50 states (TFAH & RWJF, 2013). The city of Aurora, Illinois, also has one of the largest Hispanic populations in the United States, with a Hispanic-American population of 81,809 (41.3%) (City-data.com, 2012). In Illinois, 29.3% of adults are obese and 34.5% of adults are overweight (Illinois Alliance to Prevent Obesity [IAPO], 2015; Kaiser Family Foundation, 2015 & U.S. Department of Health and Human Services [USDHHS], CDC, National Center for Chronic Disease Prevention and Health Promotion [NCCDPHP], Division of Nutrition, Physical Activity and Obesity [DNPHAO], 2015). Illinois also has the fourth-highest childhood obesity rate in the United States, with one in five Illinois children classified as obese (IAPO, 2015). If obesity rates in Illinois continue on the current trajectories, by 2030, the obesity rate could reach 53.7% in the state (TFAH & RWJF, 2012).

## Statement of the Problem

Obesity is increasing in the United States, especially among Hispanic populations (CDC, 2012; Gordon-Larsen, 2003). Many researchers have described the relationship between dietary intake and the risks of obesity among Hispanic populations (Freedman, Dietz, Srinivasan, & Berenson, 1999; NHCSL, 2010). Among the contributing factors to obesity are dietary intake and physical activity, especially in non-White populations (Lin, Bermudez, & Tucker, 2003; Maynard, Baker, Rawlins, Anderson, & Harding, 2009; Van Rompay et al., 2012). However, little research has been conducted on the dietary habits of Hispanic families, and existing studies have failed to utilize a socioecological approach to explore the development of obesity among Hispanic populations (Tanofsky-Kraff et al., 2006).

The obesity pandemic can be reversed, but it requires a swift, comprehensive public health response, including culturally tailored interventions. Parents and child caregivers play a key role in family health and the development of obesity, as parents and caregivers are key decision-makers about such things as food choices, eating patterns, and physical activity. Stice, Presnell, Shaw, and Rohde (2005) underscored the importance of the first years of life in preventing obesity in adulthood. (Lytle et al., 2006) suggested that in order to make a positive change in obesity and overweight issues, proper education and awareness must be provided to the parents and caregivers.

Newby (2007) reported that Hispanic parents and caregivers are considered nutritional role models because they have significant control over and influence on their children’s food intake, selection, and preparation. Tanofsky-Kraff et al. (2006) suggested that Hispanic parents and caregivers may also play a key role in childhood obesity prevention because they can nurture positive beliefs and attitudes about healthy eating and establish family guidelines about food intake, eating behaviors, and physical activity that reduce the risk of obesity. There is currently a shortage of empirical studies that - explore nutritional “role-modeling” and socioecological factors, which affects obesity status among Hispanic parents and caregivers. Therefore, with regard to public health, these factors must be explored further to develop family-based obesity prevention programs for this population.

## Gaps in the Literature

Maintaining equilibrium of dietary intake and physical activity leads to a healthy lifestyle and decreases or eliminates comorbidities (James, 2004; Mathieson & Koller, 2006; Sealy & Farmer, 2011; WHO, 2015). Numerous factors external to the individual influence behavior. Although many weight management programs are discussed in the literature (Caprio et al., 2008; Kosa-Postl, 2006; Maynard et al., 2009; Stevens, 2010; Thomas, 2006), there is a lack of family-focused interventions (Berry et al., 2009; James et al., 2008). The family unit helps to create an environment for behavior change (Beech et al., 2004; Davison & Birch, 2001; Elder et al., 2010; Epstein et al., 2001; Lambiase, 2009; Lever & Wilson, 2005; Rothbaum, Rosen, Ujiie, & Uchida, 2002; Scheinmann, Chiasson, Hartel, & Rosenberg, 2010; Sealy, 2010).

In addition, chronic disease is often self-managed in part by a healthy diet (Ayala, Baquero, & Klinger, 2008). The Hispanic population in the United States consumes a diet that is less healthy, especially when compared with other racial/ethnic groups in the

United States, partially because of food insecurity and decreased access to healthy foods, in addition to a lower socioeconomic status (Matheson, Varady, Varady, & Killen, 2002; Mazur, Marquis, & Jensen, 2003; Sharkey, Nalty, Johnson, & Dean, 2012). However, the counterintuitive phenomenon that researchers call the “Hispanic mortality paradox” has led to the hypothesis that specific components of Hispanic culture may offset the negative effect of poverty on mortality outcomes among Hispanics (Pérez-Escamilla, Hromi-Fiedler, Vega-López, Bermúdez-Millán, & Segura-Pérez, 2008).

In addition, the migration and acculturation processes are among the social mechanisms that seem to connect ineffective health practices to the risk for particular chronic health conditions, including obesity (Ayala et al., 2008). Researchers have indicated that the healthfulness of the Hispanic diet deteriorates during the acculturation process (Mazur et al., 2003; Patil, Hadley, & Nahayo, 2009; Satia-Abouta, 2003). However, because the acculturation process is so complex, this relationship is not supported by conclusive evidence. In addition, there are minimal programs focusing on healthy nutritional choices for immigrated Hispanic families.

Despite the wealth of literature that exists regarding barriers to healthy dietary choices, these studies are primarily limited in scope (Chatterjee, Blakely, & Barton, 2005; James, 2004; Mathieson & Koller, 2006; Melnyk et al., 2009; Norman, Castro, Albright, & King, 2004; Obayashi et al., 2003; Power, Bindler, Goetz, & Daratha, 2010; Robinson, 2008; Sallis & Glanz, 2009; Silva et al., 2008; Taylor, Serrano, Anderson, & Kendall, 2000; Vitale, 2010). The concept of acculturation is a crucial component when developing health programs, intervention, or policies to target the Hispanic population

(Betancourt & Fuentes, 2001). Most researchers who have studied acculturation and obesity focus almost entirely on (a) African-American and Asian populations, (b) interventions that are not theoretically based, (c) large population-based data sets exclusive of Latino/Hispanics, and (d) individual versus socioecological factors. Moreover, empirical studies examining the influence of acculturation are conflicting and vary according to the instrument used to measure acculturation (Marin & Gamba, 1996; Satia-Abouta, 2003; Taras, 2011; Wallace, Pomery, Latimer, Martinez, & Salovery, 2010). Further, studies are needed to examine the roles of the food planner and food preparer within Hispanic/Latino families and how these roles may contribute to child and adolescent body weight.

## Purpose of the Study

The purpose of this correlative and predictive study was to determine how sociodemographic and socioecological factors of acculturation; gender; dietary intake of saturated and trans fats, sugar, fruits, and vegetables; and an individual’s role as food purchaser and food planner/preparer are associated with obesity among Hispanic parent’s/child caregivers in Aurora, Illinois.

## Research Questions

1. What is the relationship between gender, role as food planner/preparer, role as food purchaser, and obesity among Hispanic parent/child caregivers in Aurora, Illinois?
2. What is the relationship between acculturation, intake of saturated fats, intake of fruits, intake of sugars, and intake of vegetables?

3. What combination of sociodemographic factors such as gender, acculturation, intake of saturated fats, intake of sugars, intake of fruit, intake of vegetables, role as food purchaser, and role as food planner/preparer reliably predict obesity in Hispanic parent/child caregivers in Aurora, Illinois?

**Hypotheses**

$H_1$: $H_{01}$: The is no relationship between gender and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a1}$: The is a relationship between gender and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_2$: $H_{02}$: There is no relationship between the food purchaser or who are not the food purchaser and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a2}$: The food purchaser is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_3$: $H_{03}$: There is no relationship between the food planner/preparer or who are not the food planner/preparer and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a3:}$ The food planner/preparer is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_4$: $H_{o4}$: There is no relationship between acculturation and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a4}$: Acculturation is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_5$: $H_{o5}$: There is no relationship between dietary intake of saturated and trans fats and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a5}$: Dietary intake of saturated and trans fats is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_6$: $H_{o6}$: There is no relationship between dietary intake of sugar and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a6}$: Dietary intake of sugar is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_7$: $H_{o7}$: There is no relationship between dietary intake of fruits and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a7}$: Dietary intake of fruits is negatively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_8$: $H_{o8}$: There is no relationship between dietary intake of vegetables and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a8}$: Dietary intake of vegetables is negatively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_9$: $H_{o9}$: There is no relationship between acculturation, intake of saturated fats, intake of fruits, intake of sugars, and intake of vegetables.

$H_{a9}$: There is a significant relationship between acculturation, intake of saturated fats, intake of fruits, intake of sugars, and intake of vegetables.

$H_{10}$: $H_{o10}$: All of the independent variables: acculturation; gender;

dietary intake of saturated and trans fats, sugar, and fruits and vegetables; role as food purchaser; and role as meal planner and preparer are not predictors of obesity among Hispanic parent/child caregivers in Aurora, Illinois.

*$H_{a10}$:* At least one of the independent variables: acculturation; gender; dietary intake of saturated and trans fats, sugar, and fruits and vegetables; role as food purchaser; and role as meal planner and preparer is a predictor of obesity among Hispanic parent/child care givers in Aurora, Illinois.

## Research Variables

Independent variables included in this study are: gender, acculturation, dietary intake (intake of fruits and vegetables, fat, and sugar), one's role as food purchaser, and one's role as food planner/preparer. The dependent variable is obesity (yes/no).

## Theoretical Framework

The SEM provided a framework for this research study (Davis & Engel, 2011; Elder et al., 2010; Nichols, White, & Price, 2006; Sharma, 2008). The SEM is based on the premise that multiple factors beyond the individual influence health, health behavior, and/or health care decision-making (Himes & Dietz, 1994). Townsend & Foster (2013) asserted that the SEM allows for a multilevel analysis of the micro-, meso-, and macro-level factors that have an interwoven relationship. According to McLeroy, Bibeau, Steckler, and Glanz (1988), the SEM consists of patterned behavior that determines the outcome; five factors determine that behavior: (a) intrapersonal factors (e.g., knowledge, behaviors, attitudes); (b) interpersonal factors (e.g., social support, social networks); (c) institutional factors (e.g., organizational/social institutions); (d) community factors (e.g., neighborhoods, churches, community networks); and (e) public policy (e.g., legislation, policy, law; see Figure 1). The SEM provides a holistic view of the mechanisms that contribute to or deter obesity-related diseases and comorbidities rather than focusing on only individual-level characteristics, which do not encompass the spectrum of factors that affect health. The SEM depicts multiple factors and interactions that may influence obesity among families (Davis & Engel, 2011; Elder et al., 2010; Nichols et al., 2006; Sharma, 2008). The Midwest or North Central United States encompasses many social, environmental, and structural barriers that may perpetuate obesity risk in Hispanic parents and child caregivers. A more detailed explanation of these factors and their importance within the SEM is provided in detail in Chapter 2.

*Figure 1.* The socioecological model of health. Adapted from Division of Cancer Prevention and Control National for Chronic Disease Prevention and Health Promotion. (2015e). Social Ecological Model. Retrieved from http:www.cdc.gov/cancer/crccp/sem.htm. Reprinted with permission.

## Nature of the Study

In this correlational and predictive cross-sectional study, I used a quantitative survey design to examine socioecological and sociodemographic factors that may influence obesity among Hispanic parents and child caregivers in Aurora, Illinois. Quantitative research is viewed as confirmatory and deductive in nature. The philosophical worldview behind quantitative research is derived from a postpositivist perspective (Creswell, 2009). According to positivism, reality should be shaped by empirical data: researcher and data are independent of each other and are derived from the senses rather than interpreted from metaphysical constructs that cannot be measured (e.g., the existence of metaphysical beings) (Creswell, 2009). Quantitative researchers assume that reality exists and that it is fixed and measurable.

Postpositivists accept that theories, background, knowledge, and values of the research can influence what is observed (Mertler & Vannatta, 2013). The postpositivist paradigm assumes that "knowledge is conjectural, research is always imperfect and fallible" (Creswell, 2009, p. 7). Theories act as guidelines of how the world should operate and must be frequently tested, confirmed, and amended so that the population can properly navigate and make sense of the world (Creswell, 2009). An additional assumption with deduction in nature research is the process of making claims, explaining a situation, and testing a theory by breaking ideas down into small segments to be tested "such as the variables that comprise hypotheses and research questions" (Creswell, 2009,

p. 7). The data and evidence shape the knowledge gained based on objectives or unbiased observations and measurements (Creswell, 2009).

Consequently, developing numerical depictions of observations and studying individual behavior are the cornerstones of postpositivist inquiry (Creswell, 2009). The most appropriate method relative to research regarding the postpositivist philosophy includes selecting a theory, collecting evidence that supports or refutes the specified theory, and completing the necessary adjustments before further research is implemented (Creswell, 2009). The sociodemographic and socioecological factors that will be examined in this study include gender, acculturation, dietary intake (consumption of fruits and vegetables, sugar, and fat), socioeconomic status, role as food purchaser, role as food preparer, and obesity status.

This researcher collected data face to face using three survey instruments: a demographic survey, the Block Fat/Sugar/Fruit/Vegetable Screener (BFSFVS) survey, and the BAS. All surveys were offered in both English and Spanish, and participants did not need to provide any identifying information. This researcher used the BFSFVS survey to assess dietary intake with subscales of fat, sugar, and fruits and vegetables; gender; height; and weight in Hispanic parents and child caregivers in Aurora, Illinois. The BFSFVS survey collected self-reported height and weight, which then allowed me to calculate the body mass index (BMI). The BAS measured acculturation. The demographics survey inquired about one’s role as food purchaser and/or food preparer, gender and socioeconomic status. Chapter 3 provides more details about these instruments.

I used a purposive, volunteer sample by using venue-based sampling methods for recruitment. When recruiting volunteers and choosing venues for data collection, I reached participants through various sites and activities that involve the population under study. I recruited participants from Latina Talk and Tea, whose purpose is to provide various health promotion and education programs provided in Spanish that target the needs and well-being of Hispanic families in Aurora, Illinois.

## Operational Definitions/Definition of Terms

*Acculturation*: The complex process in which the immigrant (minority) culture adopts the values, attitudes, beliefs, customs, and behavior of the new (majority) culture (Ghaddar, Brown, Pagán, & Díaz, 2010, p. 192; Purnell & Paulanka, 2013, p. 8). Immigrants have given up most traits from the culture of origin (Ghaddar et al., 2010). Acculturation in this study will be measured with the BAS.

*Assimilation*: The process of the social, economic, and political integration of immigrants (minority) into the mainstream society (Purnell & Paulanka, 2013, p. 8). This is the gradual adoption and incorporation of the characteristics of the prevailing culture.

*Attitude*: The state of mind or feeling about some matter of a culture (Purnell & Paulanka, 2013, p. 403). Attitudes are a learned behavior (Cherry, 2014, para. 4).

*Belief*: Something that is accepted to be true, especially a tenet or a body of tenets accepted by people in an ethnocultural group (Purnell & Paulanka, 2013, p. 403).

*Body mass index* (*BMI*): The most common measurement for defining overweight and obesity. Using the metric system, BMI is calculated by taking the weight in kilograms divided by height in meters squared ($kg/m^2$) (Flegal, Tabak, & Ogden, 2006, p.

755). An additional formula to calculate BMI is to divide weight in pounds (lbs) by height in inches (in) squared and multiply by 703 (CDC, 2015a). BMI is a classification of weight status. BMI ranges for adults, which are as follows: BMI less than 18.5 equals underweight status; 18.5 to 24.9 equals normal weight status; 25.0 to 29.9 equals overweight status; and 30.0 and above equals obese weight status (CDC, 2015a).

*Child caregiver*: A primary person on whom a child needing care is dependent for his or her daily activities, which may include but are not limited to grooming, dressing, getting in and out of beds and chairs, toileting, feeding/nutritional choices, making medical decisions, protection, affection, monetary needs, and learning basic life coping skills (Hunt, Levine, & Naiditch, 2005, p. 11; Let's Move!, 2015c; Work and Family Researchers Network, 2014). The quality of life for the child needing care would be diminished or endangered without that primary caregiver.

*Contextual factors*: Influences that are external to an individual are referred to as contextual. These influences can be in either a physical or a social setting and can be interpersonal, environmental, community, institutional, or policy (McLeroy et al., 1988, p. 355).

*Culture*: The beliefs, values, practices, and attitudes accepted by a community of individuals. Culture is learned not inherited, and it is passed from generation to generation (Koplan, Liverman, & Kraak, 2005).

*Cultural competence*: In health care, having the knowledge, abilities, and skills to deliver care congruent with the cultural practices and beliefs of the client (Lytle et al., 2006; Purnell & Paulanka, 2013, p. 6).

*Dietary acculturation*: The process by which members of a relocating group adopt the food choices and eating patterns of their new environment (Satia-Abouta, 2003, p. 74).

*Dietary behaviors*: The term, also referred to as eating habits or food habits, includes individual, social, cultural, religious, economic, environmental, political factors that influence habitual decisions of an individual when choosing what foods to eat (Diet Health, 2014, para 1).

*Dietary intake*: The daily consumption of fruits, vegetables, dairy products, protein, grains, oils and fats, added sugar, sodium, and alcohol (Dietary Guidelines Advisory Committee [DGAC], 2010, p. 1).

*Ethnicity*: Relates to the sense of identity an individual has based on common ancestry, nationality, or religious, tribal, linguistic, or cultural origins (Kittler & Sucher, 2012, p. 4).

*Family*: Any person(s) who plays a significant role in an individual's life (Human Rights Campaign, 2014, para. 2). This may include a person(s) not legally related to the individual (Human Rights Campaign, 2014, para. 2). Members of family include spouses, domestic partners, and both different-same and same-sex significant others (Human Rights Campaign, 2014, para. 2). A minor member of family includes parents, regardless of the gender of either parent, foster parent, same-sex parent, step-parents, and persons operating in caretaker roles (Human Rights Campaign, 2014, para. 2).

*Food access*: A community having sufficient resources to obtain foods for a diet that is nutritious, affordable, and within close proximity to individuals (WHO, 2014b, para 2).

*Food desert*: An area in the United States with limited access to food that is affordable, nutritious, and fresh (American Nutrition Association [ANA], 2010, para 1).

*Food habits*: The ways in which humans use food, which includes the methods in which food is obtained, stored, prepared, served, and consumed (Kittler & Sucher, 2012, p. 2).

*Hispanic*: A person whose origin or culture is Mexican, Cuban, South or Central American, Puerto Rican, or other Spanish area, regardless of race (United States Census Bureau [USCB], 2010).

*Immigrant*: Denotes foreign-born racial/ethnic minorities who migrate to a developed country or persons who migrate from an urban to a rural area (Satia-Abouta, 2003).

*Individual factors*: Intrinsic characteristics, or an individual's knowledge, attitudes, skills, and demographic attributes (e.g., age, gender, ethnicity, and socioeconomic status) (United States Department of Agriculture [USDA] & USDHHS, 2010, p. 55).

*Midwest United States*: The region consists of 12 states in the north-central and central United States: Illinois, Indiana, Ohio, Missouri, Iowa, Michigan, Minnesota, Wisconsin, Kansas, Nebraska, North Dakota, and South Dakota (USCB, 2015c).

*Morbidly obese*: BMI greater than or equal to 40 kilos per meter squared (CDC, 2010, para. 2).

*Obese*: A person more than 20% above his or her ideal weight, taking into account the person's height, age, sex, and build (MedicineNet.com, 2015).

*Obesity*: Among adults, a BMI greater than 30 signifies obesity (Flegal, Carroll, Kit, & Ogden, 2012; National Institutes of Health, 1998; Skinner, Mayer, Flower, Perrin, & Weinberger, 2009). Children and adolescents whose BMI is equal to or greater than the 95th percentile for their age and gender according to growth charts are considered obese (CDC, 2010a; Troiano & Flegal, 1998). In this study, obesity, a dichotomous variable, was calculated by the BMI formula. BMI greater than 30 will be representative by 1 = "yes" and less than 30 will be a 0 or "no."

*Overweight*: Among adults, a BMI between 25 and 30 signifies overweight (CDC, 2015e; Troiano & Flegal, 1998). Children and adolescents who have a BMI equal to or greater than the 85th percentile for their age and gender according to growth charts are considered overweight (CDC, 2010a; Troiano & Flegal, 1998).

*Socioecological model of health* (*SEM*): The interplay of intrapersonal, interpersonal, institutional, community, and policy factors that shape and/or affect health behavior (McLeroy et al., 1988).

*Values*: Principles and standards that are important and have meaning and worth to an individual, family group, or community (Purnell & Paulanka, 2013, p. 409).

## Assumptions

In this study, I assumed that participants' self-reported answers were truthful and accurate and that participants completing the surveys were able to read and understand English and/or Spanish.

## Limitations

This study included several limitations. The first limitation of the study is the use of self-reported data of sociodemographic and socioecological predictors that may not accurately influence obesity in the study. Self-reported information is often suspect, and inaccuracy in self-reports has been noted to cause recall bias and social desirability effects (Babbie, 2012). However, I attempted to minimize this error by organizing the questions in the survey in a way that aided the respondents' memory but did not influence their responses. Second, the results of the study are based on how participants were feeling at one point in time. Third, because the study used a non-randomized sampling method and participants resided in one U.S. county, the results of this study cannot be generalized to Hispanics in, for example, Michigan, nor in the United States as a whole. Finally, the term *Hispanic* includes a broad range of Latin subpopulations. This study did not examine differences between these subgroups.

## Delimitations

This study included five delimitations. First, the sample participants consisted of men or women ages 18 years and older. Second, the participants resided in Aurora, Illinois. Third, the participants identified themselves as Hispanic. Fourth, the participants indicated that they are parents or child caregivers. Fifth, the participants were delimited to those who could speak or write in English or Spanish at a minimum of a fifth-grade level.

## Significance of the Study

Obesity rates are increasing in the growing Hispanic population in the United States (Calzada & Anderson-Worts, 2009; CDC, 2009; Chatterjee et al., 2005; Khan, Sobal, & Martorell, 1997; NHCSL Hispanic Obesity Initiative, 2010; Ogden & Carroll, 2010). The Hispanic population harbors a significant proportion of comorbidities and deaths in the United States (August et al., 2008; Butte et al., 2006; Calzada & Anderson-Worts, 2009; Fisler & Warden, 2006), and obesity contributes to many of these. The state of Illinois is one of the largest regions in the United States with immigrated Hispanics (City-Data.com, 2012) and the fifth-largest population of Hispanics by state in the United States (Pew Research Center, 2013).

In Aurora, Illinois, the Hispanic population is 81,809, which is 41.3% of the city population (City-Data.com, 2012). To date, there have been no obesity-related studies published about Hispanic parents and caregivers in Aurora, Illinois. Moreover, existing research is unclear about the significance of acculturation on dietary intake and obesity in the immigrated Hispanic population. In addition, researchers publishing on this topic have not used a socioecological approach (Akresh, 2007; Ayala, Mickens, Galindo, & Elder, 2007; Butte et al., 2006; Carmichael, Shaw, Song, & Abrams, 2010; Chavez, 2011; Elder et al., 2010; Ghaddar et al., 2010; Gray, Cossman, Dodson, & Byrd, 2005; Lara, Gamboa, Kahramanian, Morales, & Bautista, 2005; Patil et al., 2009; Petti & Cowell, 2011; Salsberry & Reagan, 2009; Satia-Abouta, 2003; Sharkey, Johnson, & Dean, 2011;

Sobal, Hanson, & Frongillo, 2009; Wakimoto, Block, Mandel, & Medina, 2006; Ward-Begnoche, Gance-Cleveland, & Portilla, 2009). Therefore, this study may provide further insight into how the SEM can be used to explain factors that are associated with obesity among Hispanic parents and child caregivers.

Further, this study supports the USDHHS initiative “Healthy People 2020,” a guiding document containing health-related objectives for the United States. Objective NWS-6-9, pertaining to Nutritional Weight Status, proposes the development of culturally tailored nutrition or weight programs and interventions that would help to decrease rates of overweight and obesity in the United States (USDHHS, 2015). Therefore, the results of this study may also serve as a needs assessment for public health educators, nurses, nutritionists, teachers, or others involved in the plight to reduce obesity and to develop culturally sensitive, family-based nutritional education programs and interventions for Hispanic families.

## Summary

In this study, I addressed a gap in the literature by using the SEM to explore factors that may correlate to and/or predict obesity among Hispanic parents and child caregivers in Aurora, Illinois, a city with a large Hispanic/Latino population. In Chapter 1, I provided background information concerning obesity in the United States, how the Hispanic/Latino populations are affected by obesity, the role parents and child caregivers play in preventing obesity, gaps in the knowledge base, and the need for culturally tailored, family-based obesity programs for Hispanic/Latino families. In Chapter 2, I provide an in-depth review of the literature concerning the socioecological and sociodemographic factors under study. In Chapter 3, I provide a detailed explanation of the study methodology. In Chapter 4, I will discuss the results of the research. Finally, in Chapter 5, I will include a discussion of the study limitations, implications of the study findings and their relevance to social change, and recommendations for future research.

# Chapter 2: Literature Review

## Introduction

Obesity is increasing in the United States, especially among Hispanic populations (CDC, 2009a; Gordon-Larsen, 2003). In this chapter, I present a review of the literature on the socioecological and sociodemographic factors that may affect obesity among Hispanic populations as well as summarize the limited research published on Hispanic parents and caregivers and their roles in obesity development and prevention. Socioecological and demographic factors addressed in this chapter include (a) acculturation, (b) family roles of food purchaser and food preparer, (c) dietary intake of fats, sugar, and fruits and vegetables, (d) gender, (e) education, and (f) socioeconomic status.

The literature search strategy is described in the next section. Although numerous researchers have examined obesity in men and women and among various ethnic populations, insufficient literature examines factors that influence obesity among Hispanic parents or caregivers and their role in influencing nutritional health and obesity. Further, research relating to this issue that uses the SEM is lacking. Therefore, this chapter will also include a description and application of the SEM.

## Literature Search Strategies

I conducted the literature search using the following databases: Walden University's and Aurora University's Cochrane, CINAHL, Medline, PubMed, Science Direct, and SAGE Health Sciences databases, SAGE Online Journals, Google, and Google Scholar. The CDC, Kaiser Family Foundation, the United States Department of

Health and Human Services, the United States Department of Agriculture, and the WHO were used to collect statistics, background information, and figures regarding acculturation and obesity in the Hispanic population. The following keywords were used for the literature search: *Acculturation*, *Acculturation and Adults*, *Acculturation and Hispanic*, *Acculturation and Hispanic Adults*, *Acculturation and Mothers*, *Acculturation and Females*, *Acculturation and Males*, *Acculturation and Parents*, *Acculturation and Child Caregiver*, *Acculturation and Parent and Child Caregiver*, *Acculturation and Dietary Intake*, *Acculturation and Nutrition*, *Acculturation and Hispanic and Dietary Intake*, *Acculturation and Obesity*, *Obesity Acculturation and Hispanic Americans*, *Hispanic Immigration*, *Hispanic and the Midwest United States*, *Obesity Hispanic and Knowledge of Obesity*, *Dietary Intake*, *Body Mass Index*, *Hispanic and Age*, *Hispanic and Gender*, *Hispanic and Education*, and *Hispanic and Socio-economic Status.*

**Study Selection Criteria**

Selection criteria for peer-reviewed articles included (a) articles that were published in English, (b) articles that discussed or described factors that influenced obesity, (c) articles that included information about family-based interventions, (d) articles that included information about Hispanic populations and obesity, (e) research about acculturation in relation to health or obesity, (f) articles that discussed the role of caregivers or family members in the development of obesity, (g) literature published about the SEM and its application to health, (h) instruments used to collect data about nutrition and obesity, and (i) articles published about programs and interventions that address obesity within the United States. Due to a scarcity of studies that examined obesity in Hispanic families in the Midwestern United States, more than 492 articles on the topic of obesity were examined from the past 16 years (1997 to present) to gain an adequate understanding of factors that influence Hispanic families in the Midwest.

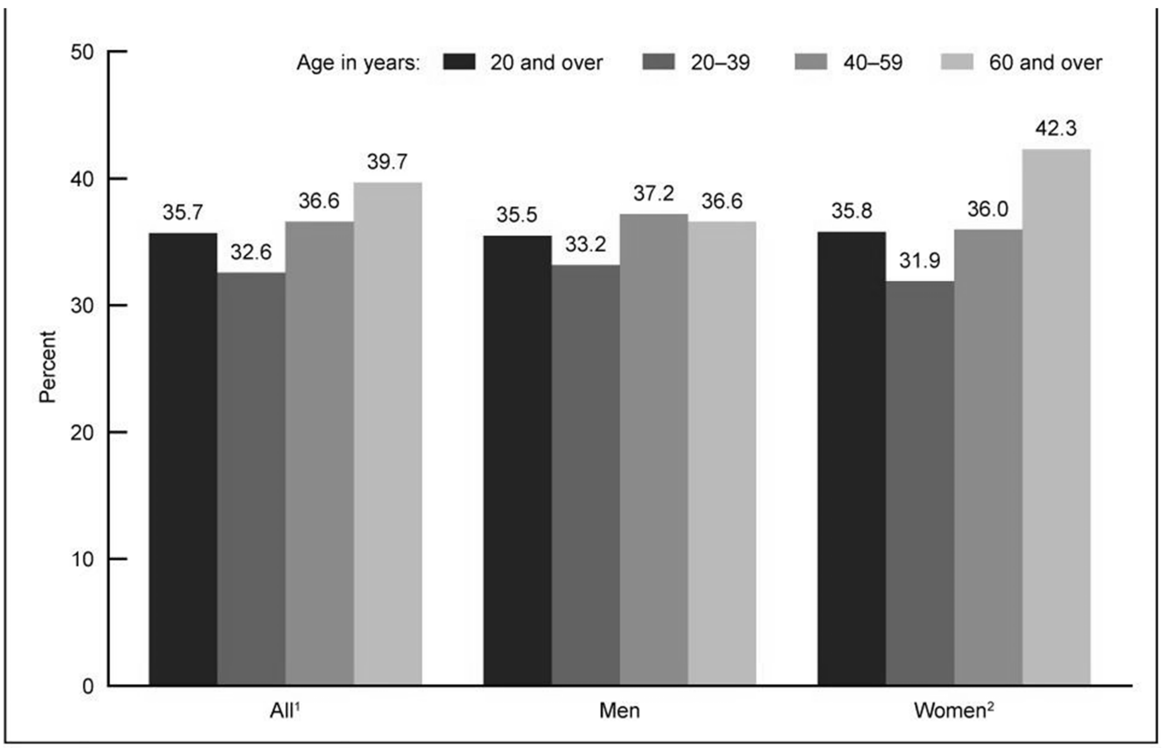
## The Global Affect of Obesity

Obesity is a critical public health issue for the United States and many other modernized countries. The WHO and the United States Public Health Service (USPHS) recognize weight management and healthy eating as global and national priorities. Globally, obesity has reached pandemic proportions. More than 1 billion adults are overweight and of those, 300 million are obese—and these numbers have more than doubled in the last three decades (WHO, 2015). In fact, approximately 78% of the world's population resides in countries that are overweight (WHO, 2015). Obesity is a major contributor to chronic diseases and disabilities, and it kills more people than starvation or malnutrition (Horton, 2012). Obesity is linked to cardiovascular disease, hypertension, stroke, cancer, diabetes, and premature death; it causes approximately 3 million deaths worldwide every year (CDC, 2011a; WHO, 2014a). In addition, adult obesity is associated with reduced quality of life, social stigmatization, and discrimination (CDC, 2011b). This preventable pandemic affects millions of lives each year, affecting families of all ages and regions—from every educational, financial, and cultural background.

## The Obesity Epidemic in the United States

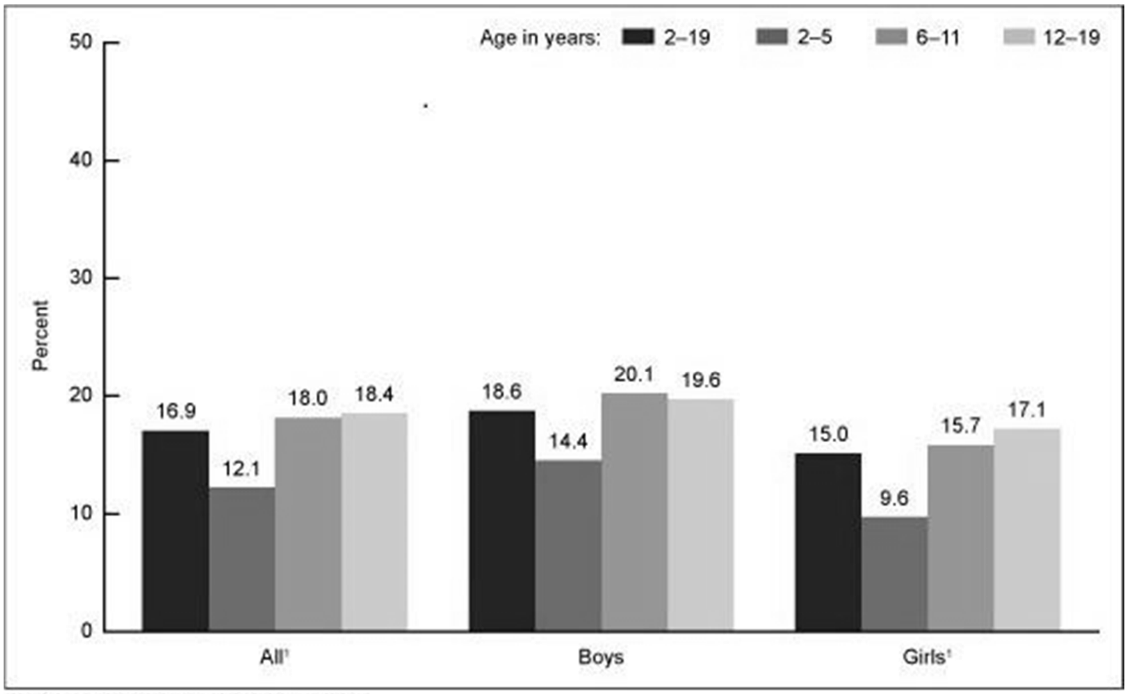
It is a modern-day reality that most Americans are overweight. The CDC and the National Health and Nutrition Examination Survey (NHANES) 2009–2010 report that

69.2% of adults in the United States aged 20 years and older are overweight; further, 35.7% are obese, and 5.7% are morbidly obese (CDC, 2010a; Ogden et al., 2010, figure 2). It is estimated that if the obesity rates continue to rise, there will be 65 million more obese adults by 2030 than today (50% of men and 45% to 52% of women) (Henry, 2011, para. 4; TFAH 2013). In addition, the results of NHANES 2009–2010 indicate that obesity prevalence among all children and adolescents from ages 2 to 19 is 16.9%, and overweight prevalence is 31.8% (CDC, 2008a; Himes & Dietz, 1994). Figure 3 shows that in children ages 2 through 5, 26.7% are overweight and 12.1% are obese (Ogden, Flegal, Carroll, & Johnson, 2002). A crucial public health concern is childhood obesity; it has more than tripled since 1980 (TFAH, 2013, para. 4).




[1]Significant increasing linear trend by age ($p$ < 0.01).
[2]Significant increasing linear trend by age ($p$ < 0.001).
NOTE: Estimates were age adjusted by the direct method to the 2000 U.S. Census population using the age groups 20–39, 40–59, and 60 and over.
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2009–2010.

*Figure 2.* Prevalence of obesity among children and adolescents, aged 20 years and older, by sex and age: United States 2009–2010. Adapted from *National Health and Nutrition Examination Survey, 2009–2010,* by CDC/NCHS, 2012. Retrieved from http://www.cdc.gov/nchs/data/databriefs/db82.pdf




¹Significant increasing linear trend by age ($p < 0.005$).
SOURCE: CDC/NCHS, National Health and Nutrition Examination Survey, 2009–2010.

*Figure 3.* Prevalence of obesity among children and adolescents, aged 2–19 years, by sex and age: United States 2009–2010. Adapted from *National Health and Nutrition Examination Survey, 2009–2010,* by CDC/NCHS, 2012. Retrieved from http://www.cdc.gov/nchs/data/databriefs/db82.pdf

## Obesity in Illinois

Although obesity is a problem everywhere in the United States, there are regional differences. Thirty-nine U.S. states have widespread obesity of 25% or greater (CDC, 2015c). Obesity prevalence in the United States ranged from 20.7% at its lowest in Colorado to a high of 34.9% in Mississippi in 2011 (CDC, 2015f). As reflected in Figure 4, 12 states—Texas, Oklahoma, Arkansas, Louisiana, Mississippi, Alabama, Missouri, Kentucky, South Carolina, West Virginia, Indiana, and Michigan—have a prevalence of obesity greater than 30% (CDC, 2015f). Parallel with the United States, overweight and obesity among adults, adolescents, and children in Illinois has dramatically increased; the state ranks 23rd among the 50 states for obesity (TFAH, 2013). In Illinois, 28% of adults are obese and more than 37% of adults are overweight (CDC, 2015f). Illinois is ranked fourth in the nation for obesity among children (ages 0 to 17 years), affecting 21% (IAPO, 2015a, para. 1). One in every five Illinois children is obese (TFAH, 2009). Further, nearly one-third of Illinois adolescents are overweight or obese, ranking 10th in the nation (IAPO, 2015b, para. 2). When isolating the statistics for older Illinois children, it is clear that the problem only regresses. Of children ages 10 to 17 years residing in Illinois, 34.9% are overweight or obese (Kaiser Family Foundation, 2015). Moreover, a staggering 22% of children ages 3 to 7 years of age residing in Chicago are *obese*, according to studies conducted by the Consortium to Lower Obesity in Chicago Children [CLOCC] in 2013 (Choucair & Byrd-Bennett, 2013).


*Figure 4*. United States obesity percent rates by state. Adapted from “Prevalence of Self-Reported Obesity Among U.S. Adults BRFSS, 2011,” by CDC, 2012. Retrieved from http://www.cdc.gov/obesity/data/adult.html

**Obesity in Kane County and Aurora, Illinois**

A suburban county 40 miles west of Chicago, Kane County has the fifth-largest population among the 102 Illinois counties and contains the highest proportion of Hispanic residents. The Kane County 2012–2016 Community Health Improvement Plan (KCCHIP) reports that, from the adult population in Kane County, 34.5% are overweight and 29.4% are obese (Kane County Health Department [KCHD], 2011, p. 17). Kane County has three geographical divisions: North, Central, and South. Southern Kane County includes the cities of Aurora, Batavia, Kaneville, and Sugar Grove. As indicated in the Kane County Community Health Survey 2011, Southern Kane County reports that 33% are overweight and 37% are obese (KCHD, 2011, p. 41, figure 5). Kane County’s highest rates of obesity are among populations with incomes $25,000 or less and in people 35 to 75 years of age (KCHDt, 2011, p. 46, figure 6).

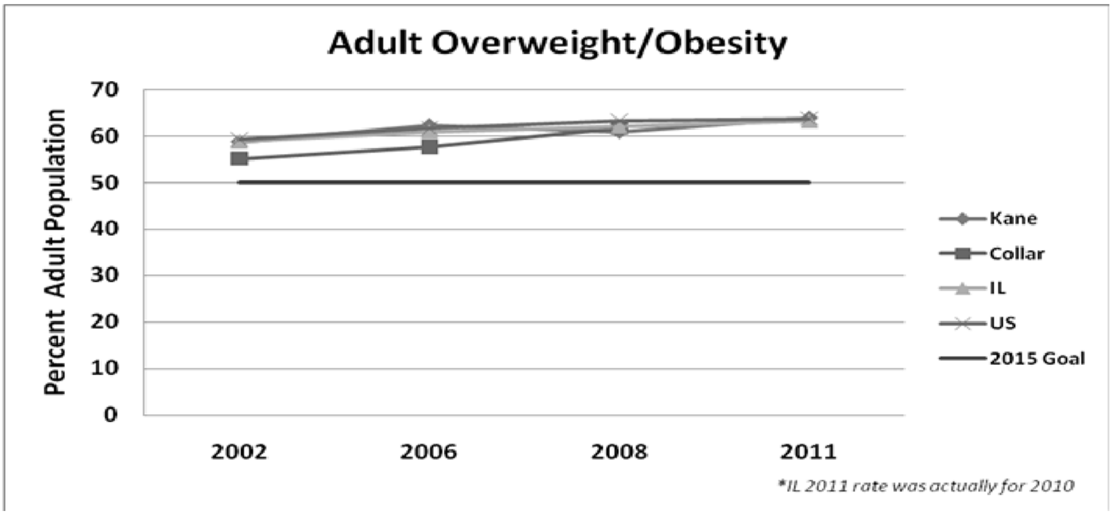



*Figure 5*. Line graph showing the rise in obesity of Kane County, Illinois adults between 2002 and 2011. From “Kane County 2012–2016 Community Health Improvement Plan,” by the KCHD, 2011, p. 15. Retrieved from http://kanehealth.com/PDFs/CHIP/CHIP-short.pdf

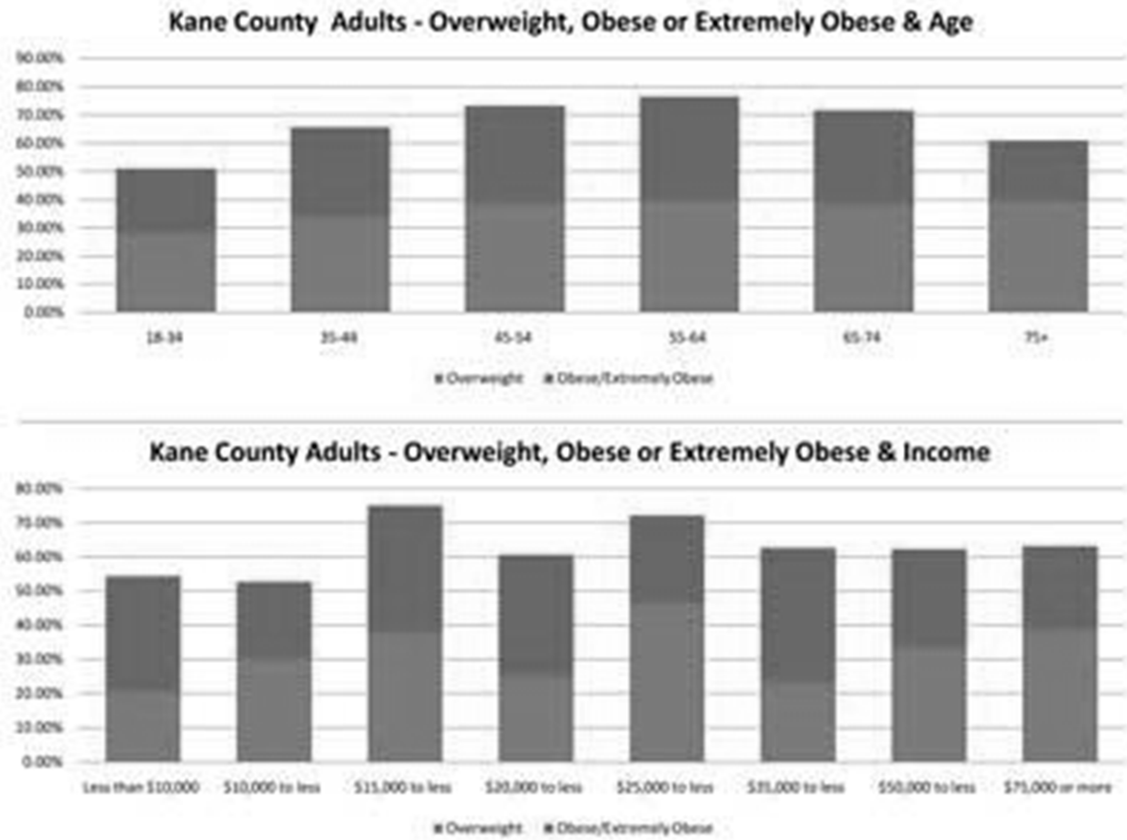



*Figure 6*. Bar graph depicting the numbers of Kane County adults who are overweight, obese, or extremely obese and their income. From "Health Matters," by the Kane County Health Department, 2011. Retrieved from http://kanehealth.com/HMArchives11/healthmatters_10-21-11.htm

## U.S. Classification of Racial and Ethnic Populations

The United States is a diverse country, racially and ethnically, with several cultural migratory patterns. There are six races officially recognized by the Census Bureau: White, American Indian and Alaska Native, Asian, Black or African American, Native Hawaiian and Other Pacific Islander, and people of two or more races (United States Census Bureau, 2010b). The United States Census Bureau classifies Americans as "Hispanic or Latino" and "Non-Hispanic or Latino," which identifies Hispanic or Latino Americans as a racially diverse ethnicity. Hispanic, Latino, or Spanish origin includes the nationality group, heritage, country of birth, or lineage of the person or of that person's ancestors before his or her arrival in the United States (USCB, 2010). The racial majority are White Americans (non-Hispanic/Latino or Hispanic/Latino), which make up 72% of the U.S. population (USCB, 2015a). Hispanic or Latino Americans comprise 15% of the population, making up the largest ethnic minority (USCB, 2015a). Black or African Americans comprise 13% of the population and make up the largest racial minority (USCB, 2010). Because of higher birth rates and immigration, the Hispanic or Latino population is rapidly growing in the United States and is predicted to be the largest minority group by 2050, representing one-quarter of the population (USCB, 2010).

## Obesity and Ethnicity

Parallel to the United States population, obesity in the Hispanic population has become an epidemic. A higher prevalence of overweight and obesity among individuals from ethnic minority groups in the United States is reflected in Figure 7 (Newby, 2007; Ogden et al., 2012a). The prevalence of obesity is greater among Hispanics, African Americans, American Indians, and Pacific Islanders than among non-Hispanic Whites (Newby, 2007). According to NHANES 2009–2010, the highest rates of obesity are found among non-Hispanic Blacks (49.5%), compared with 40.4% for Mexican Americans, 39.1% for all Hispanics, and 34.3% for non-Hispanics (Flegal et al., 2012). Further, in 2010, the Office of Minority Health (OMH) stated that Hispanic Americans were 1.2 times more likely to be obese than non-Hispanic Whites (United States Department of Health and Human Services. Office of Minority Health [OMH], 2015a). The prevalence of obesity among men ranged from 36.2% among non-Hispanic Whites to 38.8% among non-Hispanic Blacks (Ogden, Carroll, Carroll, Brian, & Flegal, 2012a). In addition, the prevalence of obesity among women ranged from 32.3% among non-Hispanic Whites to 58.5% among non-Hispanic Blacks (Ogden et al., 2012a).

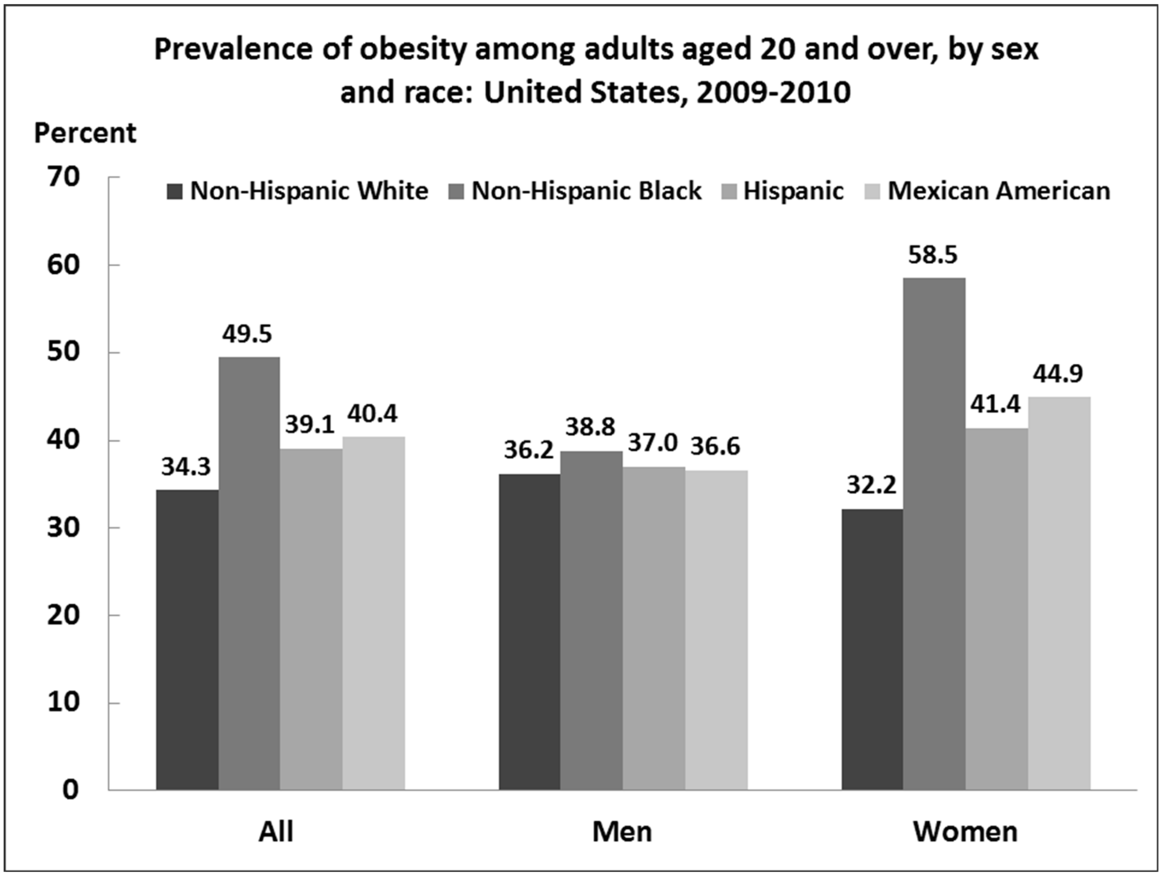



*Figure 7*. Bar graph depicting the prevalence of obesity among adults 20 and over, by sex and race in the United States between 2009 and 2010. Adapted from "Prevalence of Obesity in the United States, 2009–2010," by C. L. Ogden, M. D. Carroll, M. S. Carroll, K. Brian, & K. M. Flegal, 2012, *NCHS Data Brief, No. 82*. Retrieved from http://www.cdc.gov/nchs/data/databriefs/db82.pdf

## Obesity Among Hispanics in the United States

The Hispanic population in the United States is among the fastest-growing and youngest ethnic minority populations in the United States. Parallel to the increasing population growth is the health consequences of obesity. The data collected by the National Health and Nutrition Examination (NHANES) and the National Health

Interview Survey (NHIS), both surveys conducted by the CDC, reported that among Hispanics, 78.8% were overweight or obese, 39.1% were obese, and 5% were extremely obese. The results of the National Health and Nutrition Examination Survey (NHANES 2009–2010, 2010) indicate that obesity prevalence among Hispanic persons 20 years and older is 39.5% (Ogden et al., 2012a; OMH, 2015).

## Second-Generation Hispanics in the United States

Second-generation Americans, or 20 million adult U.S.-born children of immigrants, have greater improvement on key measures of socioeconomic attainment (Pew Research Center, 2013). However, findings have been inconsistent concerning obesity patterns of ethnic subpopulations in the United States and the effects of Hispanic acculturation and dietary patterns on Hispanic second and third generations (Popkin & Udry, 1998).

A generation is classified by a combination of parents' place of birth and place of socialization. The term "Foreign born"/"First generation" refers to people born outside the United States, Puerto Rico, or other U.S. territories to parents neither of whom was a U.S. citizen. "Foreign born," "immigrant," and "first generation" can be used interchangeably (Pew Research Center, 2013). The term "One and a half generation" (generation 1.5) refers to children of those born to foreign-born parents who came to the United States before age 12 and are the children of native parents (USCB, 2007). In the United States, social scientists use the term "second generation" which refers to the U.S.-born children of foreign-born/first-generation parents or at least one first-generation parent (Pew Research Center, 2013). People from generation 1.5 have characteristics from the country of origin but continue assimilation and socialization in the new country. Their identification will be affected by their experiences in the new country; many individuals in generation 1.5 are bicultural, combining culture from the country of origin with the culture of the new country (Schwartz, Unger, Zamboanga, & Szapocznik, 2010).

The second generation of Hispanics in the United States will have a profound effect on the population. The United States Census Bureau (USCB) reports that 36.7 million (12%) of the nation's population were foreign born and 33 million (11%) were born in the United States but had at least one parent born elsewhere in 2009 (Grieco et al., 2012). There will be a pivotal change in the makeup and projected Hispanic population over the next generation; by 2050, Hispanics will constitute 30% (132.8 million) of the nation (USCB, 2013b). A primary outcome of this population shift is the emergence of second-generation Hispanics as the largest percentage of the U.S. Hispanic population (Davison & Birch, 2001). The Hispanic population rose by 25.7 million between 1970 and 2000; immigrants comprised 45% of this increase, and second-generation Hispanics accounted for another 28% (Passel, 2008). From 1990 to 2000, 4.5 million of the 8.7 million (51.7%) children added to the U.S. population were Hispanic (CDC, 2011b). As a result of higher birth rates among Hispanic immigrants—at 3.51 births per woman versus 1.84 for non-Hispanic whites—the projected Hispanic birth rate would result in an additional 25 million second-generation Hispanics by the year 2020 (Passel & Cohn, 2007).

## Hispanic Obesity by Gender

Obesity and overweight are serious health problems for all ethnicities. However, from 2007 to 2010, women of Mexican-American heritage were 40% more likely to be overweight than non-Hispanic White women (United States Department of Health and Human Services. The Office of Minority Health [OMH], 2015b). The National Health Interview Survey (NHIS) 2007–2010 states that 33.1% of Hispanic women are obese and 44.6% of Hispanic women are overweight, while 30.7% of Hispanic men are obese and 33.6% of Hispanic men are overweight. The National Center and Nutrition Examination Survey 2007–2010 reports that 81.3% of Mexican-American men and 78% of Mexican-American women adults age 20 years and over are overweight or obese and that 36.3% of Mexican American men and 44.6% of Mexican-American women are obese (OMH, 2015b). Between the measurement periods of 1988 to 1994 and 2009 to 2010, the prevalence of obesity rose from 23.9% to 35.6% among Mexican-American men and from 35.4% to 44.3% among Mexican-American women (OMH, 2015b). However, Figure 7 shows that the prevalence for Hispanic men who are overweight is 79.9% and who are obese, 35.3%; for Hispanic women, 74.4% are overweight and 40.7% are obese among adults ages 20 years and older (Ogden, Carroll, Carroll, Brian, & Flegal, 2012b).

## Hispanic Obesity by Age Group

Obesity prevalence continues to be higher among non-Hispanic Black and Hispanic children and adolescents than among non-Hispanic White youth (Ogden et al., 2012b). BMI among children and adolescents ages 2 through 19 years among Hispanics ages 2 to 19 years, 31.6% were overweight, 16.9% were obese, and 12.3% were extremely obese. Among Hispanic youth ages 6 to 19 years of age, 41.2% were overweight and 22.9% were obese (Ogden, 2012). Between 2009 and 2010, the prevalence of obesity among children and adolescents ages 2 to 19 years among Mexican-American boys 40.56% were overweight, 24.5% were obese, 18.2% extremely obese. Between 2009-2010, the prevalence of obesity among children and adolescents ages 2 to 19 years among Mexican-American girls 38.2% were overweight, 18.2% were obese, 12.7% extremely obese. increased from 14.1% to 28.9% and increased from 13.4% to 18.6% among Mexican-American girls (Ogden et al., 2012a).

## The Terms *Hispanic* and *Latino*

Although described briefly in Chapter 1 under definitions, the terms *Hispanic* and *Latino* require a detailed description. The CDC uses the term *Hispanic* in reference to those persons with origins in Central and South America, Mexico, Cuba, Puerto Rico or other Latin American or Spanish regions. Persons who are of Hispanic origin may belong to any racial group, according to the CDC (CDC Healthy Communities Program, 2015; Davis & Engel, 2011). For purposes of data analysis, the CDC has grouped Hispanics into four categories: Mexicans, Cubans, Puerto Ricans, and Central and South Americans. The terms *Latino* and *Hispanic* are often used interchangeably. However, the information from the CDC or other sources that combine groups should not be generalized to all Hispanic populations because of the differences in culture and genetics. There are few studies that have undertaken an investigation into acculturation and dietary intake in subgroups among Latinos, including Bolivians, Salvadorans, Guatemalans, and Peruvians. However, in the cases in which research has been cited and in the medical literature, researchers use *Hispanic* rather than *Latino*. This research study will follow the same usage.

## Hispanic Populations in the United States

According to the 2011 United States Census Bureau, 52 million Hispanics (16.7% of the U.S. population) reside in the United States (CDC, 2015g). Almost 63% of the Hispanic population is of Mexican origin; Central and South Americans make up 13.5%; Puerto Ricans, 9.2%; and Cubans, 3.5% (CDC, 2015g). In 2010, 33.9% of Hispanics and 37% of people of Mexican origin residing in the United States were under the age of 18 (CDC, 2015g).

### Migratory Patterns of Hispanics to the United States

The migratory patterns of Hispanic populations have changed over the history of the United States. After the United States acquired Puerto Rico in the Spanish-American War at the end of the 19th century, residents of the island began immigrating to the United States (Rumbaut, 2006). Many Puerto Ricans migrated to New York. The first Mexican immigrants arrived in the United States during the first decade of the 20th century from the rural parts of the country (Zong & Batalova, 2014). These immigrants by and large settled in the Southern and Western sections of the United States (Zong & Batalova, 2014). Migrants from Cuba began entering the country after the ascension of Fidel Castro to power in 1959. Many upper- and middle-class Cubans of European descent came to the United States seeking political asylum (Rumbaut, 2006). In the 1970s, widespread civil unrest in El Salvador led to a Salvadoran migration into the United States (Terrazas, 2010). However, while migratory patterns have been studied, limited information exists in regard to the specific immigration history, acculturation, dietary choices, and obesity for the Hispanics residing in the Midwest region of the United States in these subgroups.

**Migratory Patterns Within the United States Among Hispanics**

According to the U.S. Census Bureau, the Hispanic population is concentrated in specific regions of the country (Brown & Lopez, 2013). The states having the largest Hispanic populations are California (14 million), Texas (9.8 million), Florida (4.4 million), New York (3.5 million), and Illinois (2.1 million) (Brown & Lopez, 2013). Hispanics from Mexico are more likely to settle in the Southern states like Texas, Alabama, Florida, Washington, D.C., Virginia, and West Virginia; and in Western states like New Mexico, Colorado, California, Arizona, and Illinois. Nearly two-thirds (63%) of Puerto Ricans live in the Northeastern United States, in states including New Jersey, Pennsylvania, New York, and the New England area, whereas four-fifths (80%) of Cubans make their homes in the Southern United States. Hispanics from South and Central America are scattered throughout the country. These differences in regional clustering are relevant because Hispanics of different nationalities and cultural backgrounds may be involved in the research that is conducted in different areas of the country (Purnell & Paulanka, 2013).

In addition, Hispanics tend to cluster within those regions: Almost half (46.4%) live in central cities, as compared to only about one-fifth (21%) of non-Hispanic Whites, who do not live in the central areas of metropolitan areas (Brown & Lopez, 2013). An almost equal number (45.1%) of Hispanics live outside central cities, as compared to a significantly greater number (56.2%) of non-Hispanic Whites. This data highlights the fact that a substantial number of migrant farm workers, who may not be counted by the census, may be illegal immigrants residing in rural areas (Pew Hispanic Center, 2005; Brown & Lopez, 2013).

**Illinois: Demographic Profile**

Because of the Hispanic population's migratory pattern to Illinois, it is important to understand the demographics of the city of Aurora and the state of Illinois. There are approximately 12,790,182 people residing in Illinois, with 6,272,579 (49.0%) of those male and 6,517,603 (51.0%) female (USCB, 2015a). The median age for Illinois residents is 37.0 years. Children under 5 years of age represent 6.6% of the population. Children and adolescents under 19 years of age represent 20.8% of the population. Residents 21 years and older comprise 71.1% of the population. Illinois' racial/ethnic groups are made up of non-Hispanic (84.5%) and Hispanic (15.5%). Of non-Hispanics (84.5%), 73.6% are White, 15.3% are Black, 0.6% are American-Indian and Alaska Native, 0.1% are Native Hawaiian and Other Pacific Islander, and 7.2% are Other. Of Hispanics (15.5%), 12.3% are Mexican, 1.4% are Puerto Rican, 0.2% are Cuban, and 1.6% are other Hispanic. The average family size is 3.25. There are 263,790 grandparents living with grandchildren under 18 years of age. Less than half of these grandparents (100,445) are responsible for their grandchildren. From the population aged 25 years and older (8,405,202), approximately 25% (2,321,339) obtained a high school diploma or the equivalency. From ages 5 years and older (11,950,566), the language spoken at home is Spanish for 1,146,812 residents. The Office of Management and Budget's (OMB)

Statistical Policy Directive 14, used by the United States Census Bureau, provides the income threshold that varies by family size and composition to determine who is in poverty. Hence, if a family's total income is less than the family threshold for that demographic, then the family and every individual within the family would be considered in poverty (United States Census Bureau. Office of Management and Budget, [USCB, OMB], 2015b). In 2010, the median household income of Illinois residents was $56,797; 12.6% of these residents reside in poverty (OMB, 2015c).

**Kane County: Demographic Profile**

Kane County, 40 miles west of Chicago, Illinois, is an ethnically, linguistically, and geographically diverse Midwestern county with a population of 515,269 residing in 30 municipalities (KCHD, 2011). Kane County is ranked the fifth-most populous of the 102 Illinois counties (KCHD, 2011, p. 2, para. 1). The population is projected to reach 800,000 by 2040 (KCHD, 2011, p. 2, para. 1). The female population is 258,454 (60.6%), and males make up 256,815 (39.4%) of the total population of the county. Kane County's median age is 35.4 years, and the fastest-growing age group is 55 to 69 years (KCHD, 2011, p. 2, para. 3). The population of children less than 5 years of age is 39,870. The largest group in Kane County is 5-to-14-year-olds, which make up about 16% (67,909) of the population. Racial/ethnic groups in Kane County comprise White (304,051), Black (27,819), Asian (17,505), American-Indian and Alaska Native (591), Native Hawaiian (130), Hispanic (158,390, or 31%), and Other (522) (USCB, 2015a; KCHD, 2011, p. 35). In addition, the 2010 U.S. Census reported that the number of Hispanics in Kane County risen threefold since 1990 to 31% of the population, a higher proportion than in any other county in Illinois (KCHD, 2011, p. 2, para. 21). In addition, in Kane County, one-third of Black non-Hispanics, 20% of Hispanics, and 5% of White non-Hispanics live below the poverty level (KCHD, 2011). The poverty rate of the total population is 11.1% in Kane County (KCHD, 2011).

**Aurora: Demographic Profile**

Situated in northeastern Illinois, Aurora is the largest city in Kane County and the city with the second-largest percentage of individuals of Hispanic descent in the state of Illinois (USCB, 2015a). Aurora's population resides in four Illinois counties: DuPage, Kane, Kendall, and Will. As of 2014, the city of Aurora had a population of 197,899 (USCB, 2015a). Aurora has a population with a median age of 30.7 years; 68% (135,409) are over 18 years of age and 9% (18,090) are under 5 years of age, while 6.5% (12,789) are over 65 years of age. The female population is 99,727 (50.4 %) and the male population is 98,172 (49.6%). The racial complexion of the city is 39.9% (78,924) White, 10.3% (20,348) Black, 0.1% (246) Native American/Alaska Native, 6.6% (13,105) Asian, 1.8 % from other races, and 41.3% Hispanic. Among the Hispanic population, individuals of Mexican ancestry predominate, with 36.8% (72,924); 2% (3,867) are from Puerto Rico; 0.2% (318) are from Cuba; and 2.4% (4,700) are other Hispanic (USCB, 2015a). From 2007 to 2011, among Aurora residents 5 years of age and older, 42% spoke a language other than English, with 78% of that group speaking Spanish (USCB, 2015a). In 2013, the median household income was $60,809, and the median family income in Aurora was $67,106 (City-Data.com, 2015). The median Hispanic income in Aurora in 2009 was $49,068, and the median Hispanic family income was $49,831 (City-Data.com, 2014). Among families with children under 18 years, 14.8% who reported income in the past 12 months were below the poverty level (USCB, 2015b). Incomes below the poverty levels were also found in 10.2% of all families and 29.6% of families with a female head of household and no husband present (USCB, 2015a).

## National and State Obesity Prevention Initiatives

There have been several national, state, and local initiatives in response to the rapidly growing rate of obesity including Healthy People 2020, Let's Move!, the IAPO, and the Quality of Kane Campaign.

### Healthy People 2020 and Obesity

Healthy People 2020 is drawn from recommendations made by the USDHHS and the CDC. The initiative provides national objectives based on science for improving Americans' health. Healthy People has established benchmarks and monitored progress over time for the past 30 years (HealthyPeople.gov, 2015a). Each topic area includes an overview, objectives, and data- and evidence-based resources (HealthyPeople.gov, 2015a). Several Healthy People 2020 topics, including nutrition, physical activity, and obesity (weight status), are leading health indicators and national priorities (HealthyPeople.gov., 2015a) and are relevant for this research study.

Many of Kane County's initiatives and coalitions have supported the national priorities described in Healthy People 2020. This study's results will support the current initiatives and provide an explanation of the health indicators in the Hispanic families residing in Kane County. The Nutrition and Weight Status objectives of Healthy People 2020 (NWS) contain 22 objectives that promote the health benefits of consuming a healthy nutritional intake and maintaining a healthy body weight. In addition, the objectives emphasize that efforts to change diet and weight should address individual behaviors. Environments that support healthy behaviors include schools, worksites, health care organizations, and communities (HealthyPeople.gov., 2015b). This research study addressed some of the Healthy People 2020 objectives relating to weight status and obesity (Appendix A). Nutrition and Weight Status Objectives 8–11 and 14–18 focus on reducing the number of adults, adolescents, and children who are obese and on preventing inappropriate weight gain in youth and adults (Healthypeople.gov, 2015b). The most relevant objective to this study is the Nutrition and Weight Status Objective 8, which advocates increasing the proportion of adults who are at a healthy weight. In addition, Nutrition and Weight Status Objectives 14–18 concentrate on food and nutrition consumption; these objectives include increasing the amount of fruits and vegetables in the diets of the population aged 2 years and older and reducing the consumption of saturated fats and calories from solid fats and added sugars in the population aged 2 years and older (Healthypeople.gov, 2015b). Nutrition and Weight Status objectives are related to this research study, which focuses on increasing the number of Hispanic families at a healthy weight. This research study's findings may be used to assist the forward movement of accomplishing the Healthy People 2020 objectives in the city of Aurora, Illinois. For a full list of the relative Healthy People 2020 objectives for Nutrition and Weight Status, refer to Appendix A.

**Michelle Obama's Let's Move! Campaign**

First Lady Michelle Obama launched the Let's Move! Campaign on February 10, 2010, to address the childhood obesity epidemic in the United States within a generation. In addition, President Barack Obama established the Task Force on Childhood Obesity to develop and implement an interagency plan to lower the childhood obesity rate to 5% by 2030. The Task Force comprised twelve federal agencies: the Corporation for National and Community Service; the Environmental Protection Agency; the Federal Communications Commission; the Federal Trade Commission; and the Departments of Agriculture, Defense, Education, Health and Human Services, Housing and Urban Development, Interior, Justice, and Transportation. The memorandum presented 70 recommendations with four priority areas that formed the primary components of the First Lady's Let's Move! Campaign, which encourages a healthy lifestyle through a comprehensive, collaborative, and community-oriented initiative. The four pillars are: (1) providing healthy food in schools; (2) empowering parents and caregivers; (3) increasing physical activity; and (4) improving access to healthy, affordable foods. In addition, the campaign included recommendations for early action in a child's life to mitigate the risk of obesity when it first emerges (Let's Move!, 2015b).

The Let's Move! initiative focuses on nutrition information through the next-generation food pyramid, which the United States Department of Agriculture (USDA) created as a way to visualize dietary guidelines. The initiative would like to provide power to consumers with the assistance of the new Front-of-Package Labeling Initiative and new Menu & Vending Machine Labeling Requirements from the United States Food and Drug Administration (USFDA). The initiative advocates that healthy eating habits be promoted by families, schools, and communities. Let's Move! also includes information for pregnant women; establishes guidelines for parents to set up and promote healthy eating habits for families and children; and advocates healthy eating habits in schools by promoting the USDA's Healthier US School Challenge (HUSSC). An additional part of the Let's Move! campaign encompasses the nationwide effort to teach health food options and culinary skills to schoolchildren through the Chefs Move to Schools program, founded in May 2010. The Let's Move! campaign promotes physical activity by providing guidelines for families, schools, and communities that promote physical activity. Finally, the campaign offers tailored information for promoting healthy eating and exercise among diverse communities, including materials in Spanish for Hispanic/Latino populations (Let's Move!, 2015c).

**State Initiative: IAPO**

In January 2010, state and local stakeholder groups formed the IAPO, which was launched and coordinated by the Illinois Public Health Institute (IPHI). The primary goal of IAPO is to ensure that trends in obesity in Illinois are stable by 2015 and declining by 2018 (IAPO, 2013). IAPO supporters believe this will occur by developing coordinated policy, systems, and environmental changes; launching a statewide campaign to disseminate and promote best practices and current information regarding obesity reduction; and encouraging public health policymakers to place obesity reduction and prevention at the top of their agendas (IAPO, 2013). IAPO has workgroups, which include Nutrition in Community and Other Institutional Settings; Physical Activity in

Community and Other Institutional Settings; Childhood Nutrition and Physical Activity in Educational Settings; Local Food Systems/Food Access; and Obesity Prevention through Clinical Interventions and Access to Care (IAPO, 2013). The IAPO and Hispanic obesity initiatives will benefit from the results of this research study.

## Kane County/Grassroots Coalitions

Kane County, Illinois, is a racially, ethnically, linguistically, and geographically diverse Midwestern county with a population of more than 515,000 persons. The vision statement for community health, "Kane County will have the healthiest people in the State of Illinois by the year 2030," resulted from strategic visioning and integrated planning efforts to address policy, systems, and environmental change in Kane County (KCHD, 2011, p. 22). In 2006, the County Board sponsored the KCHD initiative, which convened community partners to identify community health priorities and formalize measurable five-year goals and strategies to achieve the 2030 vision. The stakeholders identified a goal to reduce chronic disease with a primary strategy to focus on countywide interventions to prevent childhood obesity. A concept for a strategic initiative emerged that called for community engagement, centralized coordination, and technical assistance to prioritize and align interventions for maximum affect, and mechanisms for sustainability. This study is generated from the researchers' active participation in many of the Kane County initiatives. The study will support the Kane County Fit for Kids 2020 Plan. In addition, the results of the study will aid in the development of family-based prevention and intervention (primary and secondary) programs, which are culturally based for the Hispanic community of Aurora, Illinois.

**Kane County Fit for Kids 2020 Plan**

In April 2008, the county board chair formally launched the strategic effort Making Kane County Fit for Kids (FFK) with a leadership summit, which over 125 local leaders from the public and private sectors attended. The county health department oversees the Fit Kids 2020 Plan, which provides the framework for reversing childhood obesity by the year 2020. In 2008, the Making Kane County Fit for Kids campaign hosted a summit for Kane County cities and towns, park and school districts, faith communities, businesses, health care providers, social service agencies, and local and state elected officials. The summit provided participants with an in-depth briefing on the childhood obesity epidemic and called for a sustained, county-wide mobilization through implementation of four action principles aimed at the core systems, policy, and environmental changes needed to reverse the epidemic: 1) ensure that fresh vegetables and fruits are accessible and affordable to every family in the community; 2) develop public policies, including land use and planning, that encourage and support physical activity in all citizens; 3) provide families with current, reliable information in various settings concerning healthy eating habits and physical activity; and support an environment of health and wellness in homes, workplaces, schools, and other community institutions. Subsequently, a collaborative of local funders pooled resources and made $160,000 in seed grants to support three local community-based coalitions (in Aurora, Elgin, and the central county Tri-Cities area) dedicated to achieving these action principles through coordinated planning and community-based pilots. These principles from the summit began development of the strategies for the Fit for Kids 2020 Plan.

The Fit for Kids Funders' Consortium was formed as a partnership among public and private entities to raise funds for the implementation of initiatives. In 2009, Fit for Kids was selected by the RWJF as one of 50 Healthy Kids, Healthy Communities sites across the United States (KCHD, 2011, p. 22). The consortium formed a program designed to give organizations mini-grants that were necessary to complete their work. To date, more than $330,000 has been awarded to such projects as installing new playground equipment at a local soccer field; increasing lower-income residents' access to fresh produce; enabling several farmers' markets to accept Link cards; enabling the consortium to provide fresh produce to its clients; and providing the funding for a food bank consortium to buy refrigeration units (KCHD, 2011, p. 22).

In 2011, Kane County completed the Community Health Assessment by collection and analysis of recent social, health, housing, economic, and other data, as well as qualitative input, directly from residents brought together in Community Cafes, focus groups, Quality of Kane Open Houses, and community meetings. The partnership for assessment additionally funded a telephone survey of residents in Kane County from the caregivers of more than 400 children and 1,500 adults. More than 200 residents participated in one of the three events, getting information and direction regarding the factors that most influence health in their community. The Quality of Kane Public Meetings conducted in 2011 provided an opportunity for community members to provide input on the planning initiatives in Kane County on the three disciplines for planning: land use, health, and transportation. (KCHD, 2011, p. 25). In addition to the Quality of

Kane, many coalitions and partnerships are actively addressing health issues in the communities (KCHD, 2011, p. 30).

**Coalitions Addressing Obesity in Kane County Fit for Kids**

Three formalized community coalitions drive the Fit for Kids efforts at the grassroots level. The coalitions expand over geographic areas to reach more than 85% of Kane's children and more than 95% of racial and ethnic minority children. Core membership includes the mayor(s) of municipalities; superintendent(s) of school district(s); community-based organizations reflective of the community demographic; local businesses; and a county government liaison. Because of the funding, the coalitions were able to expand and enrich their membership (with an emphasis on recruiting leaders and community members from Hispanic communities) and broaden their scope of work to reach 100% of Kane County children. Funds provided coalitions with the ability to organize their constituencies and implement subsidies and incentives to innovative practices and promote adoption of policies favorable to public health. The coalitions are Active Elgin, The Healthy Living Council of Aurora, and Fit4Kane Coalition (KCHD, 2011, p. 30). Figure 8 shows the community partnerships and coalitions in Kane County including Active Elgin. Additional details and descriptions of each Aurora coalition and initiative can be found in Appendix B. However, the foundation of the creation of this study will be described via the Healthy Living Council Coalition.

**The Healthy Living Council of Aurora**

In November 2007, the mayor of Aurora and the Robert Crown Center for Health Education convened 35 community leaders for a daylong "Big Idea Summit" to explore needs and opportunities for promoting the health and wellness of Aurora's youth. In September 2008, the Aurora University Institute for Collaboration, which includes members from the Big Idea Summit, established the Healthy Living Council (HLC). The HLC leads are the Robert Crown Center and Aurora University, with members representing the City of Aurora, Aurora Township, Northern Illinois Food Bank, the Aunt Martha's Youth Center, MyTime Afterschool Program, the Visiting Nurse Association of the Fox Valley, the YWCA Aurora, Lutheran Social Services, Provena Mercy Hospital, Rush Copley Medical Center, Fox Valley Park District, and School Districts 129 and 131. The purpose of the HLC is to provide a collaborative community framework to jointly plan and implement initiatives to combat childhood obesity in the Aurora community. In October 2009, the HLC was awarded a $30,000 planning grant from the Kane County Department of Health to initiate data collection and planning for more effective obesity intervention in two of the major school districts in the Aurora community. HLC conducted community assessment and piloted a community gardens project utilizing the paid staff and volunteer resources of the Aurora Urban League and Aurora University. The HLC completed the deliverables for the awarded grant in January 2010.

**Kane County: Quality of Kane Campaign**

In 2010, the Kane County Board was the sole Illinois county government providing a strategic plan that integrated land use, health, and transportation into the

Kane County 2040 master plan (KCHD, 2011, p. 6). The formal collaboration between Community Health, Transportation, and Land Use resulted in the “Quality of Kane” Campaign. The campaign encapsulated the county’s “mission to maintain and enhance an exceptional Kane County with Healthy People, Healthy Living, and Healthy Communities” (KCHD, 2011, p. 7, figure 4). Each department conducted several open houses both rural and urban areas throughout the county; these meetings discussed Kane County plans in the past, present, and future. The Quality of Kane campaign included the launch of the Kane County Planning Cooperative (KCPC), whose primary goal is to encourage information sharing and education, relating, and planning in order to help with planning decisions at the local level. The KCPC includes county planners from three departments: Health, Development and Community Services, and Division of Transportation (KDOT), and also has support from the Chicago Metropolitan Agency for Planning (CMAP) (KCHD, 2011, p. 8). In 2011, the Community Health Department, working with local hospitals—Fox Valley United Way, Delnor Hospital, Provena Saint Joseph Hospital, INC Board, Rush-Copley Medical Center, Provena Mercy Medical Center, and Sherman Hospital, as well the United Way of Elgin—undertook a health assessment to create a guide for future health planning and to comply with the state’s requirement that local health departments update their community health action plans every five years. The outcome of the health assessment resulted in five priorities: (1) eliminate the disparity in rates of infant mortality among African-Americans; (2) improve access to health care; (3) increase the level of community mental health services; (4) reduce chronic disease; and (5) maintain basic protection services for public health. As a result of assessments and plans formulated in the past, other coalitions, partnerships, and initiatives were created, including the Mental Health Council, Circle of Wise Women, Breastfeeding Coalition, Perinatal Committee, Coalition for Health and Wellness, KCHAIN, Healthy Homes, Kane Kares, Environmental Health, Help for Homeowners and Making Kane County Fit for Kids (figure 8). The results of this study provided information to guide and develop family-based interventions and obesity prevention educational programs, which support the Fit Kids 2020 plan within the Quality of Kane Model.

| | |
|---|---|
| Active Elgin | An initiative that brings together all community sectors to work in concert, providing residents with the opportunity to improve their health and well-being, as well as their overall quality of life |
| Perinatal Committee | The committee comprises representatives from community health centers, hospitals, home visitation programs, and early intervention agencies that together focus on coordinating and collaborating about review studies of infant deaths, health messages, and referral and linkage systems. |
| Kane County Health Access Integrated Network (KCHAIN) | KCHAIN aims to increase the ability to access specialty care for the uninsured and underinsured while decreasing the inappropriate use of emergency rooms through increased community awareness and increased coordination between providers. |
| Kane County Continuum of Care | The continuum brings together a number of community and faith-based groups that serve Kane County's homeless population to ensure best practices and coordination of service. |
| Kane County Breastfeeding Coalition | The coalition promotes the health benefits of breastfeeding. |
| Compañeros en Salud | The organization provides diverse groups, including the Hispanic community, with access to services and resources regarding health and well-being. |
| All Our Kids Early Childhood Network (AOK) | This network brings together more than 200 agencies in the field of child services that strategically address gaps in services. |
| Kane County Healthy Places Coalition | This new initiative from the Kane County Health Department will create the ability to address environmental issues in settings occupied by children and improve child health outcomes through the establishment of a network to focus on child environmental health in three county communities whose demographics indicate a disproportionate risk of environmental danger: Carpentersville, in northern Kane County; Elgin, in northern Kane County; and Aurora, in southern Kane County. |
| Home Visitation Collaborative | The collaborative supports Kane County's low-income families through evidence-based home visitation programs. |

*Figure 8*. Community partnerships and coalitions in Kane County. Adapted from "Kane County 2012–2016 Community Health Improvement Plan," by the Kane County Health Department, 2011, p. 30. Retrieved from http://kanehealth.com/PDFs/CHIP/CHIP-short.pdf

## Why a Socioecological View Is Important for Obesity Prevention

Despite national and local efforts to address obesity as mentioned previously, Hispanic Americans, especially Hispanic immigrants, are experiencing high rates of obesity. There is a lack of culturally tailored obesity-prevention programs that are family-based and include a socioecological framework (Fetro, 2010; K. S. James et al., 2008; Lissau, 2005; Pratt, Stevens, & Daniels, 2008; Tyler & Horner, 2008; Zenzen & Kridli, 2009). The SEM provides a holistic examination of the factors that may contribute to or deter disease rather than focusing on the individual level. The SEM addresses the social and environmental context in which health behaviors can occur and/or may be reinforced. Hispanic immigrants adjust to a new environment and culture and may adapt to a more sedentary lifestyle and unhealthy diet, which may lead to significant increases in obesity in first and subsequent generations. Families are important referents in establishing health behaviors in children, and there are broader social and physical environmental factors that may be associated with the development of obesity. Immigrant families must try to be healthy while dealing with acculturative stressors. Relationships among these factors have been the subject of research in isolation.

Those working in obesity prevention may develop programs based on the SEM that address various societal factors (e.g., cultural norms, environmental factors, socioeconomic resources) that play an influential role in adopting healthy behaviors associated with obesity. Most health promotion programs and policies target individual behavior with a focus on an increase in physical activity or a change in dietary habits. These programs and policies often fail due to lack of appropriate support and cultural relevance. An alternate approach would be to increase availability of healthy food, positive social interaction, and public transportation to low-income neighborhoods and to build recreation areas and facilities to promote physical activity (Ruhm, 2008). As Robinson (2008) states, “Improving the health of vulnerable populations requires interventions, which target multiple levels of influence, in multiple settings, and utilize multiple intervention strategies” (p. 398). It is in this context that health promotion programs, particularly those that aim to reduce the increasing number of those who are obese, become a public health priority.

Further, existing research and interventions neglect variables related to acculturation and parents/caregivers and families. One of the variables explored in this study is acculturation and its potential relationship to obesity among Hispanic parents/caregivers. The Hispanic family may be the key to developing, implementing, and evaluating comprehensive interventions. Although facilitating the use of multiple-level factors may aid in coordinating primary prevention strategies, the framework promotes movement toward a society oriented toward chronic disease prevention. Efforts to improve obesity may be more likely to be successful when using such a coordinated, multi-factor approach. Multiple factors, external and internal to the individual, are addressed in the SEM. The following section will present some of the socioecological factors discussed in the literature that may play a role in obesity among Hispanic communities in the United States.

## SEM of Health

The SEM provides a framework to illustrate the incorporation of prevention and intervention targeting obesity. The SEM is characterized as an interdisciplinary approach to shaping an individual's food choices that may lead to obesity. The interventions that involve multiple components are the ones that have been shown to be the most effective in changing behaviors.

The SEM integrates multiple levels that affect behavior and/or influence health behaviors and health outcomes. The levels of influence are based on five key components: intrapersonal, interpersonal, institutional, community, and public policy (McLeroy et al., 1988). The intrapersonal level consists of characteristics of the individual, including attitudes, behaviors, self-concept, and skills. The interpersonal level includes informal and formal social networks, primary groups, and family and other social support systems. The institutional level includes social institutions with organizational characteristics and formal and informal operational rules and regulations (McLeroy et al., 1988; Freedman et al., 2005). The community level involves relationships within organizations and informal networks with defined boundaries, such as a neighborhood. Public policy, the last level, public policy, comprises local, state, and federal laws and policies (McLeroy et al., 1988).

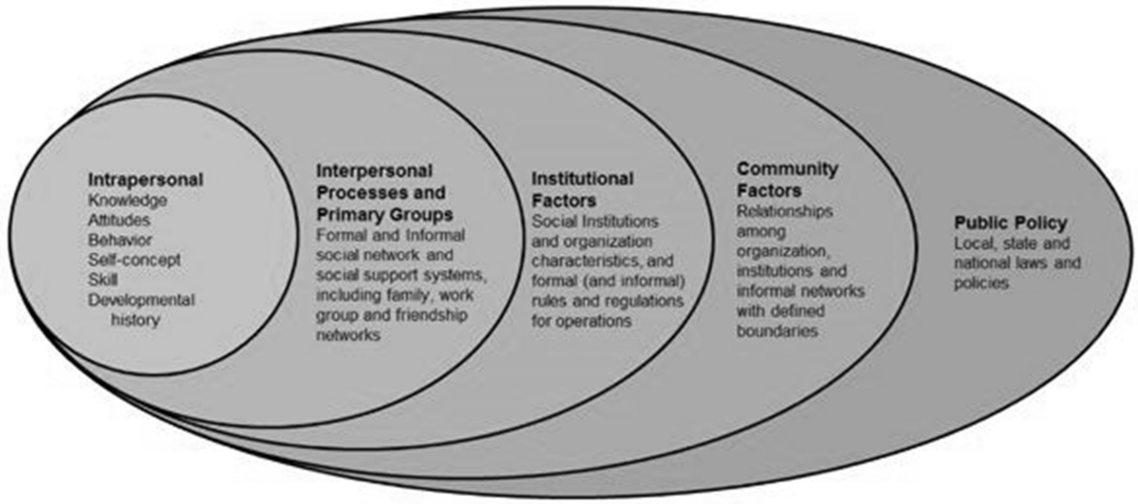



*Figure 9.* The socioecological model. Adapted from: “The Social Ecology of Health Promotion Interventions,” by K. R. McLeroy, A. Steckler, D. Bibeau, and K. Glanz (Eds.), 1988, *Health Education Quarterly, 15*(4), p. 355. Retrieved from http://www.acha.org/healthycampus/ecological_model.cfm. Reprinted with Permission.

**Intrapersonal Factors**

Intrapersonal factors are characteristics within the control of an individual (Fitzgerald & Spaccarotella, 2009). Individual factors, including gender, age, race/ethnicity, genetics, and gender, all play a part in a family’s or an individual’s physical activity patterns and food intake. An individual’s or family’s knowledge, attitude, beliefs, and behaviors may be considered. At this level, a lack of cooking skills and knowledge of nutrition, as well as taste preferences (Shepherd & Towler, 2007) may act as barriers to choosing a diet that is healthy. In particular, research shows that barriers to the intake of fruits and vegetables may include inadequate cooking skills (Hughes, Bennett, & Hetherington, 2004) and low nutrition knowledge (Wardle, Parmenter, & Waller, 2000). The nutrition-related skill of using food labels to obtain and understand nutrition facts also has a positive relation to nutrition knowledge (Soederberg Miller &

Cassady, 2015), as well as to fruit and vegetable intake (Fitzgerald, Damio, Segura-Pérez, & Pérez-Escamilla, 2008; Satia, Galanko, & Neuhouser, 2005).

**Interpersonal Factors**

Interpersonal factors involve the primary social relationships surrounding the affects that social traditions, culture, and role expectations have on the patterns and practices surrounding eating within family, friends, and peer groups. These include primary groups; social networks, both formal and informal; and social support systems including peers, family, friends, and coworkers that provide role definition, support, and social identity (McLeroy et al., 1988; Robinson, 2008). Studies have shown that intake of food among children is related to both the food intake and the nutrition knowledge of their parents (Gibson, Wardle, & Watts, 1998; Reinaerts, de Nooijer, Candel, & de Vries, 2007). Children and adolescents tend to associate healthy foods with parents (Shepherd et al., 2006). Educational programs to increase peer support for good nutritional choices and nutrition knowledge may help in overcoming the barriers. Lifestyle behaviors are influenced by socioeconomic factors. For example, among families in which the mother works full time, research reports a lower frequency of weekly family meals (Neumark-Sztainer, Hannan, Story, Croll, & Perry, 2003). This association could be due to the affordability and convenience of meals that are not prepared in the home and/or increased time constraints having to do with employment. Healthier food choices and the availability of family meals within the home are related to eating healthful diets (Neumark-Sztainer et al., 2003).

Another barrier to healthy eating may be lack of time (Jenkins & Horner, 2005; King et al., 2000). Lastly, computer use or television viewing may be an intrapersonal or interpersonal factor since it can apply to either an entire family or to an individual, where they are influenced by such factors at the public policy level as food advertisements (Fitzgerald & Spaccarotella, 2009). Children's requests for advertised foods are associated with greater screen time; eating candy, sugar-sweetened drinks, and fast food (Wiecha et al., 2006); and more sedentary behaviors (The Henry J. Kaiser Family Foundation [Kaiser], 2004).

**Institutional Factors**

The organization and/or institutional levels include operational rules, regulations, policies, and informal structures (Robinson, 2008). People spend a majority of their lives in organizational settings; these settings have a strong affect on health-related behaviors (Richards et al., 2008). These social institutions include neighborhoods, workplaces, schools, recreation facilities, faith-based organizations, and food retail and food-service establishments (Freedman et al., 1999; McLeroy et al., 1988). All these settings play a crucial role in determining families' and individuals' choices of physical activity and food choices and environment through the health information they provide to consumers. Organizations may provide important sources of social and economic support and may shape values and attitudes through social and organizational culture (McLeroy et al., 1988). Acculturation is possibly a barrier at the interpersonal and community or institutional level because culture can be interpreted as a part of the social environment mostly within the community and the family. Social norms, or guidelines that may regulate behaviors, beliefs, and thoughts, are based on the society's values and are reflected in both laws and personal expectations. As they concern physical activity and nutrition, these norms may affect the choice of what foods and beverages are consumed and how and when they are consumed; how much physical activity an individual incorporates into his or her life; and the acceptable ranges of body weight. Studies have revealed that greater acculturation is linked to lower intake of vegetables and fruits (Neuhouser, Thompson, Coronado, & Solomon, 2004), as well as nutrients like vitamins and minerals, and to a greater consumption of fat among Hispanics (Dixon, Sundquist, & Winkleby, 2000). Since organizational settings have a significant affect on health behavior, the results of the study may describe the relationship through the acculturation process affecting obesity in the Hispanic family.

**Community Factors**

Community factors are norms and social networks, or standards that exist as informal or formal relationships among individuals, groups, and organizations (Robinson, 2008). Many sectors, including public health and health care systems, government, the media, and agriculture, can influence communities. These sectors can be important in deciding the degree to which families and individuals have access to the chance for physical activity in their communities, as well as to healthy food. Individual environmental socioeconomic characteristics and status affect eating behaviors. Eating behaviors and food choices may be influenced by limited food availability, fewer stores that stock healthy foods (Horowitz, Colson, Hebert, & Lancaster, 2004), and a greater availability of fast food restaurants (Morland, Wing, Diez Roux, & Poole, 2002) in more socioeconomically limited communities. In addition, the community may be impeded from full access to better food selections because of inadequate access to private transportation (Morland et al., 2002). Finally, eating more often at restaurants leads to dietary intake of larger portions, as well as foods high in calories, fat, and sodium (Popkin, Duffey, & Gordon-Larsen, 2005).

### Public Policy Factors

Public policy, the last level of factors, consists of local, state, and federal policies and laws that support or regulate healthy practices and actions for early detection, disease prevention, and control. For example, the Supplemental Nutrition Assistance Program (SNAP, commonly known as "food stamps") is an important resource for reducing food insecurity in low-income populations (Fox, Hamilton, & Lin, 2004). A cyclic eating pattern may develop when using SNAP versus at other times that is characterized by excessive eating, resulting in the possibility that individuals may not be eating enough to achieve a healthful diet (Dinour, Bergen, and Yeh, 2007). Individuals' food intake patterns may be affected by policies that influence food cost, since less nutritional foods are reported to cost less than healthy foods (Monsivais & Drewnowski, 2007), and cost is one factor that determines food choice (International Food Information Council Foundation, 2011).

## Socioecological Factors That Influence Obesity

Understanding the affect of risk behaviors on weight status requires a consideration of the determinants that contribute to the development of obesity (Davison & Birch, 2001; Ogden et al., 2012). This section will discuss the components of the SEM and factors that may influence the risk of obesity in Hispanics. Figure 10 illustrates the components of the SEM and the factors that may affect dietary intake. Figure 8 illustrates the components of the SEM and the factors that may influence obesity in the Hispanic population. Although Figure 9 identifies factors that may affect children, they are relevant to Hispanic parents/childcare in the Midwest United States as well.

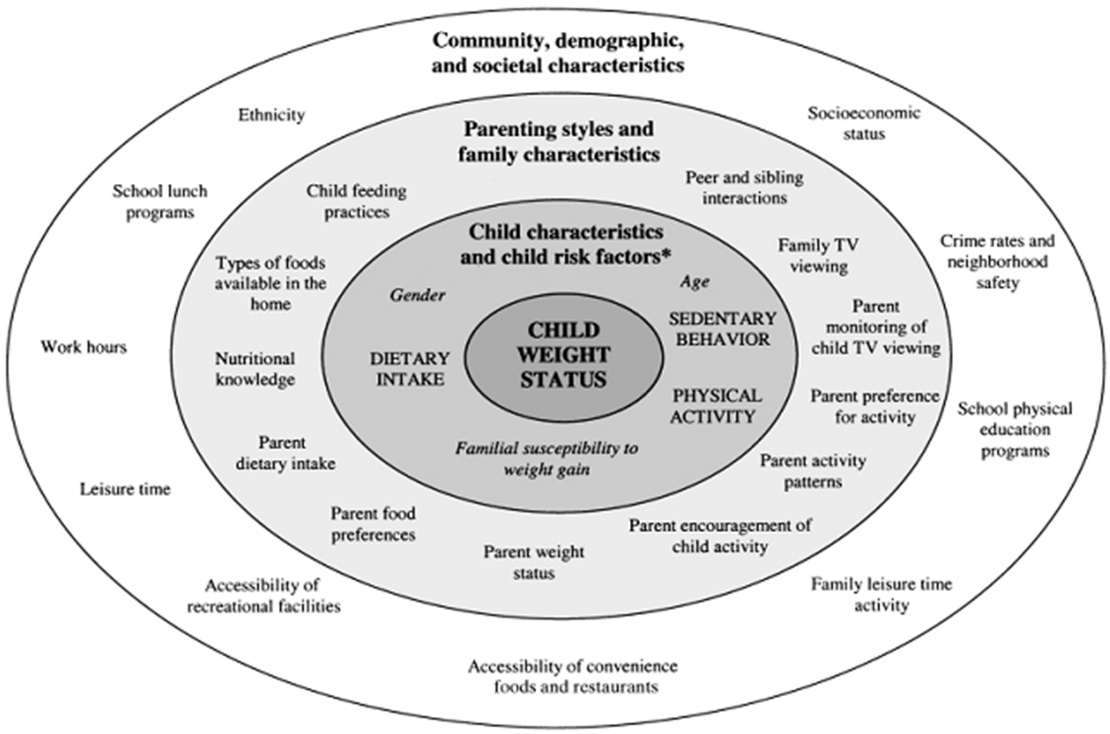



*Figure 10*. A diagram depicting the socioecological effects on a child's weight status. Adapted from "Childhood Overweight: A Contextual Model and Recommendations for Future Research," by K. Davison and L. Birch, 2001, *Obesity Reviews, 2*(3), p. 161. Reprinted with Permission.

## Genetics and Obesity Among Hispanics

Although Hispanics display higher levels of obesity, genetic predisposition may partially contribute to obesity related to comorbidities. The Hispanic population is genetically more inclined to develop abdominal adiposity, which is a precursor to type 2 diabetes, cardiovascular disease, and metabolic syndrome (Arredondo, Elder, Ayala, Campbell, Baquero, & Duerksen, 2006). Metabolic syndrome comprises a cluster of conditions, including elevated triglycerides, high blood pressure, and insulin resistance. Arya et al. (2004) proposed that genetic factors are responsible for up to 40% of the development of obesity and trunked fat characteristic to Hispanics. Metabolic syndrome affects nearly 27% of Hispanic-American adults and approximately 10.9% of Hispanic-American adolescents (López-Jaramillo, Herrera, Garcia, Camacho, & Castillo, 2008). In addition, two genes, the Trp64Arg variant and chromosome 3p, predispose an individual to develop diabetes. This genotype may serve as a determinant in Hispanics to other physical consequences of obesity including asthma, fatty liver, and precocious puberty (Mirza et al., 2004).

On the other hand, gene and environment interaction, otherwise known as the "thrifty genotype hypothesis," and nutrition deficiency during fetal development may be responsible for predisposition of obesity (Perichart-Perera, Balas-Nakash, Schiffman-Selechnik, Barbato-Dosal, & Vadillo-Ortega, 2007). The hypothesis maintains that survival is predicated on the ability of an individual to conserve energy stores and minimize energy expenditure. The population would develop individuals who would have energy-efficient metabolisms whether food was scarce or plentiful. However, recently nutrition has become available and energy expenditure has decreased, resulting in populations who are now energy efficient and have excess calories to store as adipose tissue and obesity as a result (Hassink, 2007). Visceral fat poses a substantial threat, leading to a high rate of lipolysis and subcutaneous fat. A large waist circumference has also been found to elevate the incidence of hypertension in children as young as 8 years of age (Colin, 2009). Although research has examined the risk of overweight and obesity associated with genetic factors, the second generation may be a determinant to obesity in Hispanic families.

## Acculturation

Acculturation is a complex process, a phenomenon that occurs when an individual engages in a new (majority) culture and may lose his or her original (minority) culture patterns (Ghaddar et al., 2010; Purnell & Paulanka, 2013, p. 8). Acculturation refers to the joining of ethnic groups from different origins into a common culture with outcomes such as similarity in behavioral patterns, eating habits, language, or dress habits (Colby, 2005). Berry, Phinney, Sam, & Vedder (2006) argued that acculturation occurs when an individual's exposure to the new culture is greater than that individual's exposure to the original culture.

Assimilation and acculturation are related concepts. However, assimilation is when the acculturating individual loses the original (minority) cultural identity and takes on a new identity in the second (majority) culture (LaFramboise, Hardin, Coleman, & Gerton, 1993, as cited in Ashford & LeCroy, 2013; Purnell & Paulanka, 2013, p. 8). Mendoza (1994) proposed a bimodal or bicultural model of acculturation, suggesting that individuals might retain their original culture while obtaining traits from a new culture and maintain equality among cultural traits, ultimately becoming fluent in two cultures (Davis & Engel, 2011).

The process of acculturation can be interpreted as an outcome between two cultural attitudes. Berry et al. (2006) described three outcomes: reaction, adjustment, and withdrawal. Reaction is the process of attempting to adjust to the source of the conflict. In adjustment, the affected group or individual undergoes changes to lessen conflict between the minority culture and the majority or dominant culture by assuming behaviors and beliefs similar to the dominant culture. Withdrawal entails changes that are designed to do away with the conflict. Both withdrawal and reaction are negative attitudes regarding the dominant culture (Berry, 1980). These responses may have an affect on attitudes toward the adoption of the new culture and health beliefs and practices.

Acculturation can be measured in many different ways, including language proficiency, length of residency in the host country, self-identification, or generation level (Satia-Abouta, 2003). The transition can be influenced by the speed of assimilation, whether or not the individual voluntarily immigrated to the United States, and if there are similar levels of education and customs with the new community. During the acculturation process, individuals will assume the cultural norms of a host country, maintain traditions, or adopt a combination of the two (Berry, 2005). Thus, acculturation may have either a positive or negative affect on the immigrant. While there has been considerable research on the causes of obesity, a gap in the literature surrounds Hispanic acculturation, the process in which immigrants adopt the lifestyle of characteristics of the United States or other new country. Acculturation can further influence the health of the Hispanic family and may lead to obesity (Khan et al., 1997; Lin, Huang, & French, 2004).

**Acculturation and Obesity Among Hispanics**

Studies of Hispanics in the United States have verified harmful effects of assimilation into the prevailing current U.S. culture on many lifestyle/behavior characteristics (Van Rompay et al., 2012). Several studies (Chen, 2009; Khan et al., 1997; Lin et al., 2003; Pérez-Escamilla et al., 2008; Petti & Cowell, 2011; Sussner et al., 2008; Unger et al., 2004) discussed the fact that acculturated groups are more likely to engage in activities that may lead to obesity. Hispanics become acculturated to the new society and become heavier by consuming more fried food and less fruit (Escarce, Morales, & Rumbaut, 2006). Unger et al. (2004) reviewed 6th and 7th graders and showed that a higher level of acculturation was associated with higher consumption of fast food and lower levels of physical activity, two factors associated with obesity. Rosas et al. (2011) reviewed 313 Hispanic women in the San Francisco area and found that the length of residence in the United States was significantly associated with obesity (Rosas et al., 2011). One study has shown that Hispanic women born in the United States have higher rates of obesity than women born in other countries (Hubert, Snider, & Winkleby, 2005). Hispanic immigrants to the United States become acculturated, thereby potentially consuming more fat and desserts and less fiber, fruits and vegetables, whole grains, and beans and tortillas (Dixon et al., 2000; Neuhouser et al., 2004). Acculturation has been associated with increased risk of obesity and diabetes, among other chronic diseases (Caprio et al., 2008; Pérez-Escamilla et al., 2008; Pérez-Escamilla & Putnik, 2007; Sweeney et al., 2007; Wallace et al., 2010).

It is vital to consider the role of socioeconomic status (SES) provided that low language acculturation among Spanish-speakers has been linked to economic disadvantage relative to English-speaking Hispanics, and direct associations have been seen with physical health (Van Rompay et al., 2012). Studies (Chen, 2009; Khan et al., 1997; Mazur et al., 2003; Norman et al., 2004) suggest that lower-SES individuals that acculturate to residing in the United States tend to adopt inactive lifestyles and less healthy diets, which are contributing factors to obesity. However, higher SES individuals may have greater access to health care, healthy foods, and physical activity opportunities that may help offset obesity risks (Berg et al., 2003). Family, individual, and community environmental factors such as parenting styles and parents' demographic characteristics and acculturation on obesity among Hispanic elementary school children have the greatest influence on children's BMI (Anzman, Rollins, & Birch, 2010; Cullen, Baranowski, Rittenberry, & Olvera, 2000; Elder et al., 2010).

**language and acculturation.** In the event that the language spoken is different from that spoken in the dominant culture, the dominant language may be adopted by individuals. In addition, there may be an intermediate adaptation, which may result in speaking two languages or one language merging into the other (Berry et al., 2006). Assessment scales commonly use language as a component when researching acculturation. Some acculturation scales, including Short Acculturation for Hispanic Youth, Benet-Martinez Acculturation Scale, The Language Identity and Behavioral Acculturation Scale, Acculturation Rating Scale II, and The BAS for Hispanics, utilize language preference as one of the variables in determining acculturation status (Taras, 2011). Most immigrants utilize English regularly, and English is the preferred language of younger immigrants. Some younger Hispanics stop using Spanish altogether (Rodriguez-Reimann, Nicassio, Reimann, Gallegos, & Olmedo, 2004).

**identity and acculturation.** Identity is a combination of social, personal, and cultural beliefs about the self (Schwartz et al., 2010). Personal identity refers to the values, goals, and beliefs that an individual assumes and holds on to (Schwartz et al., 2010). Cultural identity and acculturation are intertwined by definition. Cultural identity is determined by the traits of characteristics maintained by individuals as regards the psychological, social, and linguistic aspects of their culture (Berry et al., 2006). Cultural identity describes an individual's attitudes, values, and beliefs. Acculturation is the behavior in which cultural identity is expressed as an individual becomes exposed to the new culture. Some individuals retain traditional religious or ethnic traditions from the original culture. The functions of identity may suggest mechanisms by which identity guides the life course that may be pertinent for immigrant people. The changes in ideals, values, and behavior that occur during acculturation have implications for how immigrant people form, revise, and maintain their identity. However, the loss of using Spanish in some families because of assimilation further wears away culture care practices and cultural identity (Leininger & McFarland, 2006; Purnell & Paulanka, 2013).

**generation status and acculturation.** An important element of acculturation is generation status. The generation level of an individual may affect his or her dietary choices (Kolodinsky et al., 2008; Mathieson & Koller, 2006; Satia-Abouta, 2003). First-generation Mexican-Americans, for example, are more likely to live in or want to live in

Mexican environments, speak only Spanish, and self-identify as Mexican (Gordon-Larsen, 2003; Satia-Aboutia, 2003; Petti & Cowell, 2011). On the other hand, third-generation Mexican-Americans are more likely reside in non-Hispanic communities, speak English, and self-identify as Latinos, Hispanics, or Mexican-Americans (Burgos, Schetzina, Dixon, & Mendoza, 2005). An immigrant's gender is associated with English proficiency (Teran et al., 2002). Males speak English more fluently (Davis & Engel, 2011; Unger et al., 2004).

The rise of second-generation Hispanics is important to consider when reviewing public policy, as the costs associated with this subgroup will affect U.S. policy in the future. This anticipated rise of the Hispanic child population will potentially put increased demands on the health care system (CDC, 2008a). If obesity intervention programs are not implemented efficiently, then child obesity among the Hispanic population may negatively affect the health care system.

The third National Health and Nutrition Examination Survey (NHANES III) looked at how the intake of food, energy, and nutrition differ in a sample of Mexican-American women and men in the United States based on the subject's acculturation status (Dixon et al., 2000). In this study, the nation of origin and the language spoken were used to measure acculturation. Energy intake was the same for Mexican-American women, whether born in the United States or Mexico, and whether the spoken language was English or Spanish (Butte et al., 2006; Sharkey et al., 2012). Women who were born in Mexico took in less saturated fats than Mexican women who were born in the United States and spoke English. In addition, the women in the study who were born in Mexico ate more magnesium, potassium, and dietary fiber than the English-speaking Mexican-American women who were born in the United States. First-generation women were more likely to have a lower socioeconomic status than women of the second-generation. However, the risk of eating a poor diet was significantly lower to first-generation Mexican-American women. Language spoken and country of birth were used to measure acculturation.

Chavez, Sha, Persky, Langenberg, and Pestano-Binghay (1994) studied how the length of residence in the United States affected the intake patterns of food groups in 60 Mexican and 36 Puerto Rican women. Based on a food-frequency questionnaire and the women's length of residency in the United States, the study showed that length of residency was inversely proportional to the amount of vitamin C- and vitamin A-rich foods consumed. Women living in the United States for more than 15 years consumed fewer vitamin C- and vitamin A-rich foods than women living in the United States for fewer than five years. This relationship was found to be significant only in Mexican Americans. Dixon et al., (2000) and Guendelman and Abrams (1995) found similar results; however, these studies used different measures of acculturation. The literature does not clarify whether length of residency in the United States, generational status, language preference, of nation of birth can be treated equally as measures of acculturative status.

## Acculturation and Diet

Dietary change associated with acculturation is frequently referred to as dietary acculturation. Dietary changes may arise as part of the overall acculturation process among Hispanic parents and caregivers (Chatterjee et al., 2005; Gance-Cleveland, Sidora-Arcoleo, Keesing, Gottesman, & Brady, 2009). Dietary acculturation denotes the process occurring when minority group members take on the food choices and eating patterns of the host country (Satia-Abouta, 2003; CDC, 2012). A complex process, dietary acculturation can result in both healthy and unhealthy dietary changes, such as incorporating healthier ingredients in traditional meals, evident by assessing food choices at various meals. There are factors that protect against dietary acculturation, including social networks from both ethnicities, inability to speak English, employment outside the home, and residing with older relatives (Sussner et al., 2008). However, several factors may contribute to dietary acculturation: television, mass media, and peer groups are elements that shape food-related attitudes and taste preferences, food procurement and preparation, and beliefs regarding ideal body size (Newby, 2007). Exposure to new foods through school lunch programs or store and food marketing may bring about dietary changes in families. In addition, following immigration, a family may incorporate food choices common to U.S. culture into their diets. These changes may lead to maintenance of traditional dietary practices among Hispanic parents and caregivers in Aurora, Illinois; adoption of new dietary practices; or a combination of both.

Satia-Abouta (2003) attributes dietary change to the power of mainstream culture, stating that exposure to the Western lifestyle leads to chronic disease. With acculturation, U.S. Hispanics, primarily Mexican-Americans, have been shown to abandon traditional, healthful dietary practices in favor of processed convenience foods (Van Rompay et al., 2012 & Variyam, 2000; Ayala et al., 2008). More frequent intake from fast-food restaurants (Ayala et al., 2008; Sharkey et al., 2012), consumption of more saturated fat (Sharkey et al., 2012), more simple sugars (Sharkey et al., 2012; Stang & Story, 2005), few fruits and vegetables (Ayala et al., 2008; Neuhouser et al., 2004) and lower dietary fiber (Kaiser, 2005) have all been reported with acculturation among Mexican-Americans (Van Rompay et al., 2012). Acculturation has been associated with increased obesity (Li, Goran, Kaur, Nollen, & Ahluwalia, 2007). The USDHHS has shown that dietary factors play a large role in four of the 10 leading causes of death: cancer, coronary heart disease, type 2 diabetes, and stroke (Bouchet, Torres, & Hyra, 2013; Petti & Cowell, 2011; Robinson, 2008). Diet can also contribute to iron deficiency anemia, high blood pressure, and osteoporosis (Butte et al., 2006; Gleason, Rangarajan, & Olson, 2000; Patil et al., 2009; Robinson, 2008).

Romero-Gwynn and Gwynn (1997) measured changes in dietary choices by studying the change in frequency of consumption of certain foods. Foods sensitive to change from acculturation were assessed by assuming a continuum from less acculturated (foods consumed in the native country) to more acculturated (foods consumed in the United States). A formula was calculated to assess the percentage of change. The study described three levels of change: stable (less than 20%), moderately sensitive (20%–39%), and highly sensitive (40% or greater). Among the foods labeled as highly sensitive, foods that were eaten less after immigrating included boiled beans, lard, sweetbreads, and “aguas frescas” (fruit-flavored water). Highly sensitive foods that increased with acculturation were breakfast cereals, flour tortillas, white sliced breads, oil, vegetable salad, margarine/butter, and Kool-Aid. The increase in consumption of vegetable salad did not indicate that more vegetables were consumed; rather it indicated a change in the frequency of consumption of selected foods, although preparation method (raw, not cooked) did change. Foods that were moderately sensitive and consumed less frequently included *carne enchilada* (meat prepared with chili), tostadas, and *cocido* (meat and vegetable soup). The consumption of cereal and eggs increased, at both breakfast and dinner. And even through vegetables were consumed more as salads, there was an increase in the consumption of margarine, mayonnaise, and salad dressing. Sandwiches replaced traditional tacos.

Satia-Abouta (2003) proposes a model of dietary acculturation in Figure 11. This model conjectures that demographic, socioeconomic, and cultural factors form a complex relationship given exposure to the host culture. Satia-Abouta (2003) contends that these characteristics predict how much new immigrants may change their beliefs and attitudes about food, food purchase and preparation, and taste preference. These factors can eventually result in changes in dietary intake (Satia-Abouta, 2003). Based on this model, data may be collected on taste preference and sociodemographic, cultural, psychosocial, and environmental factors. Psychosocial factors may be assessed through 1) taste preference; 2) how much value is placed on assimilation as opposed to traditional patterns of diet; and 3) knowledge, beliefs, and attitudes about disease and diet (Satia-Abouta, 2003). Environmental factors may be assessed through 1) food purchase and preparation; 2) affordable, accessible, and available restaurants serving traditional foods; and 3) affordable, accessible, and available markets for traditional foods.

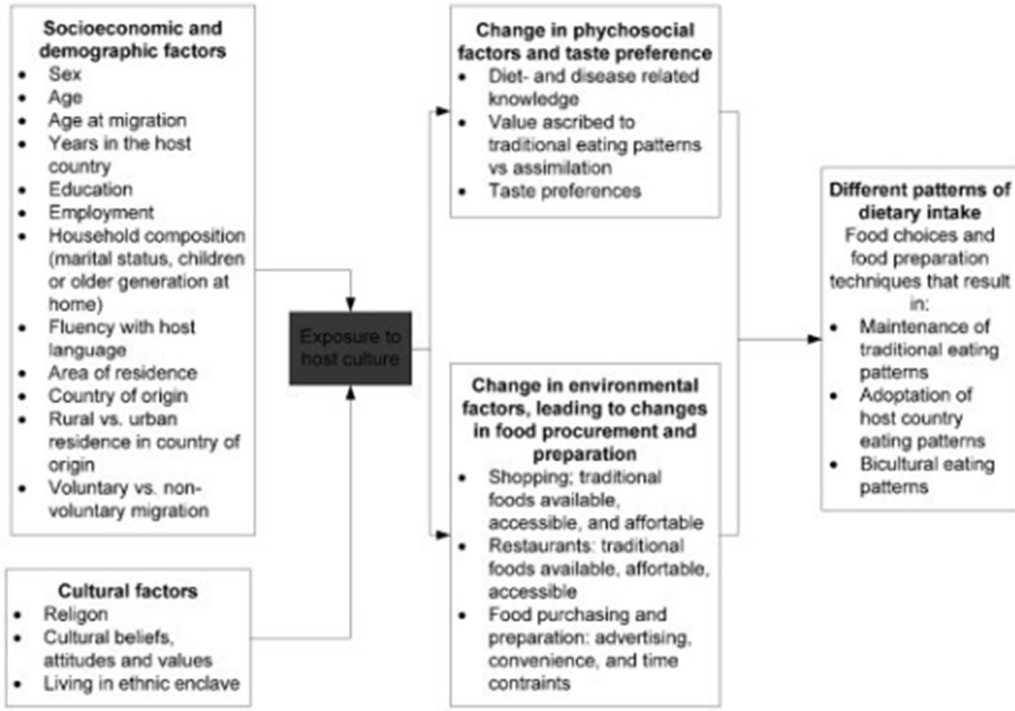



*Figure 11*. Proposed model of dietary acculturation: The process by which racial/ethnic immigrant or rural–urban migrant groups adopt the dietary patterns of their new environment. Adapted from “Dietary Acculturation: Definition, Process, Assessment, and Implications” by J. Satia-Abouta, 2003, *International Journal of Human Ecology, 4*(1), p. 76. Reprinted with Permission.

**Hispanic Cultural Norms and Influence on Obesity**

Culturally tailored obesity prevention programs for Hispanic families are lacking in Aurora. In order to affect knowledge, attitudes, and behaviors among this population, an understanding of Hispanic cultural norms and values is imperative. Hispanic cultural values have been documented in empirical literature (Lara et al., 2005; Bouchet et al., 2013; Wallace et al., 2010). Health care educators require knowledge of the cultural values with four baseline themes. First, although Hispanics are a heterogeneous group, many or most Hispanics share a set of cultural values, regardless of country of origin, acculturation level, education, or income (Bouchet et al., 2013). For instance, body type may be associated with wealth and health; those with lower incomes may believe that a larger body size is associated with success, while those with higher incomes may believe that a thinner body is undernourished (Caprio et al., 2008).

Second, Hispanics vary in the degree to which they adhere to these cultural values. The Hispanic population's culture view obesity by their understanding the complexity of the cause, evolution and treatment of obesity as an illness. For example, a particular cultural value might be very important to a Hispanic couple who immigrated to the United States and less important to their U.S.-born children. The beliefs that express the rules for engaging in behavior that promotes health, such as diet and exercise, or encourages leisure activities such as playing video games or watching television change from person to person and family to family; some individuals will value innovation and lose interest in traditional practices. For instance, consumption of fruits and vegetables among Hispanics drops as consumption of soda goes up with future generations (Caprio et al., 2008). Bilingual children from Mexican-American homes exhibit this phenomenon when they reject traditionally prepared low-calorie foods at home and favor higher-calorie snacks, beverages, and foods that they encounter at school or have seen on television. These children are often resistant to their parents' efforts to make foods from the mainstream culture less available (August et al., 2008; Caprio et al., 2008). On the other hand, if there is a cultural value that is held in high regard by the family and is particularly important to the parents, then the U.S.-born children must understand the potential affect on their health and healthy choices.

Third, all cultural values have positive and negative components. Rural migrants turn away from their traditional, vegetable-rich diets and whole grains and begin to prefer animal products and processed foods (Caprio et al., 2008). Fewer families cook meals at home, food consumed in restaurants accounts for more calories, and increased fast-food intake and snacking takes place (Caprio et al., 2008).

Finally, these “Hispanic” cultural values are not unique to Hispanics (Bouchet et al., 2013). Although the cultural values have been described in literature as existing within Hispanic communities, these cultural values are recognized in other cultures that may have different names or behavioral expression. The results of this research study will provide an insight into Hispanic cultural values that include gender roles, family dynamics, religious beliefs, and health practices in the community of Aurora, Illinois, and the affect of obesity in the community, leading to a culturally tailored prevention or intervention for Hispanic families.

**Traditional Gender Roles and Values: Machismo and Marianismo**

Cultural beliefs about gender roles may also play an important role in decision-making about food selection, purchases, and preparation for the family. Hispanics assent to the values of “machismo” and “marianismo,” which culturally influence the idealized, stereotypical gender roles of men and women in family life. Machismo is the value of masculinity that dictates that men are the providers and protectors of their family and that requires that they stifle outward displays of emotion (Santiago-Rivera, Arredondo, and Gallardo-Cooper, 2002). Marianismo, named after the Virgin Mary, the mother of Jesus, describes women as virtuous and nurturing, practicing devotion and self-sacrifice.

Marianismo dictates that women's most important role is that of mother, nurturer, and homemaker and holds that women are spiritually and morally superior to men (Santiago-Rivera et al., 2002). The traditionally structured patriarchal family unit allows the oldest male relative, usually the father, to maintain the most power; women, on the other hand, are expected to remain submissive (Kemp & Rasbridge, 2004). The matriarch of the family, however, is often the person who determines the need for medical care among family members, although the patriarch typically gives permission for that person to seek treatment (Smith, 2000; CDC, 2008b). The CDC's Healthy Communities (2015) program notes that Hispanic men are frequently reluctant to seek medical care until the need requires emergency treatment. The patriarch may also insist that others in the family, including wives and daughters, postpone treatment or remain uncooperative regarding the health care of family in general (Parangimalil, 2001). These behaviors regarding health care can significantly affect the overall health of the family.

**Family Dynamics: Familismo**

One of the most central values to Hispanic culture is the family. This value is known as familismo *(familio*). Therefore, it is important that obesity prevention programs for Hispanic populations be family based. Familismo values the family over the community or the individual and is expressed by loyalty, family tradition, unity, solidarity, and reciprocity among all family members (Smith, 2000). Familismo recognizes that family comes first, that lives are centered around the family, and that the needs of family often come first prior to individual needs. The family comprises not just parents and children, but also extended family members, all of whom play a crucial part in raising the family's children. Hispanic families are largely patriarchal, with the father in an authoritative role. However, women, especially mothers and grandmothers, have a stronger influence in child rearing. In these families, a caregiver, either the mother or an extended family member, typically stays home to care for young children. As noted by Santiago-Rivera et al. (2002), familismo remains strong among Hispanics across generations, regardless of how long a family has resided in the United States (Garza & Watts, 2010).

**Religious Values**

Cultural values relevant to Hispanics resilience include faith (*fe*) and religious rituals (*rituales religiosos*). Hispanics are primarily Roman Catholic and believe that God plays an active role in their lives. According to a study conducted by the Pew Research Center (2014), most Hispanics pray on a daily basis, attend religious services at least once a month, and display religious objects in their homes. The church and faith are usually pivotal in community and family life. Faith plays an important role in understanding illnesses and healing (Kemp & Rasbridge, 2004).

**Traditional Beliefs About Health and Illness**

Among Hispanics, the concept of health varies. Health practices are influenced by cultural beliefs (Northam, 1996). In addition, individual health practices are influenced by cultural orientation, and many values and traditions exist among Hispanics regarding health (Morales, Lara, Kington, Valdez, & Escarce, 2002). Among the many Hispanic views regarding the concept of health, some believe that good health functions as a reward for good behavior or stems from good luck (Spector, 2012). Others relate lifestyle to health (Duffy, 1997). Some Hispanics hold to the idea that poor health is related to sin, that it is a punishment, or *castigo*, and is the will of God (Spector, 2012). Often, Mexican-Americans believe that they are the masters of their own fate when it comes to matters of the supernatural (Purnell & Paulanka, 2013). Spector (2012) discussed the Hispanic idea of health as striking a balance among spiritual, social, psychological, and physical components of the person. Illnesses may be considered to come from both supernatural and natural causes. Some of these causes include: humoral imbalance, *empacho*, *mal de ojo*, *envidia*, and *susto*.

**Humoral imbalance**

Both mental and physical illnesses are believed to stem from the imbalance between an individual and his surrounding environment; these imbalances can be expressed in terms of *hot* and *cold* or *wet* and *dry* (Kemp & Rasbridge, 2004; Spector, 2012). Further, the body contain four humors, including yellow bile (hot and dry), black bile (*cold* and *dry*), blood (*hot* and *wet*), and phlegm (*cold* and *wet*) (Spector, 2012). An individual may consume herbs or foods containing the opposite quality in order to correct an imbalance, for instance, a *cold* condition would be treated with a *hot* medicine (Smith, 2000; CDC, 2008b).

**empacho**. *Dislocation* of parts of the body may also cause illness. *Empacho*, a type of this dislocation, is a kind of indigestion or upset stomach that is considered to be caused by behaviors like swallowing gum, eating undercooked food, or eating foods at the wrong time of the day. The most common treatment for *empacho* is to pinch the spine or rub the back or stomach gently with cooking oil (CDC, 2008b; Smith, 2000; Spector, 2012).

**mal de ojo.** When someone looks at another person with jealousy or admiration, that person is said to be giving the "evil eye." The receiver of the evil eye may experience sleepiness, severe headaches, malaise, and fatigue. Traditional remedies for mal de ojo include having the person who cast the evil eye take care of the victim or praying while passing an egg over the victim's body and then placing the egg in a bowl under the victim's bed overnight (CDC, 2008b; Kemp & Rasbridge, 2004).

**envidia and susto.** Mexicans often believe that envy, or *envidia*, can result in bad luck and/or illness. Success may provoke *envidia*, which can cause illness and misfortune. Some research has indicated that belief in *envidia* is associated with a lower economic status (CDC, 2008b; Spector, 2012). Another phenomenon, *susto*, or fright sickness, can arise from a frightening or traumatic experience. It is believed to cause soul loss, a condition in which the soul wanders freely about, separated from the body (CDC, 2008b; Kemp & Rasbridge, 2004). *Susto* may be accompanied by depression, anxiety, introversion, irritability, and insomnia (CDC, 2008b; Kemp & Rasbridge, 2004; USDHHS, 2013).

## Combined Practices

In many Hispanic homes, families use both Western medicine and traditional health care. Hispanic families are more likely to seek home remedies for illnesses than the rest of the population in the United States (CDC 2008; Spector, 2012). While using Western medicine may be more prevalent, those families that cannot afford Western health care often turn to traditional practices (Eggenberger, Grassley, & Restrepo, 2006). These include remedies like drinking spiced or herbal teas and seeking out care from neighbors, the community, relatives, or traditional practitioners.

Pharmacies called *boticas* can be found in many Hispanic neighborhoods (*barrios*). Families in the barrio depend on pharmacists in the *botica* to provide information about over-the-counter remedies for the relief of coughs, earaches, toothaches, sores, and other medical problems. On the other hand, certain medicines that are only sold in the United States by prescription, such as antibiotics, can easily be bought from Mexican *farmacias* (pharmacies) without a prescription. Mexicans who live in the United States often take trips to Mexico, regardless of their insurance status, to obtain prescription medications at lower cost (Becker, Garcia, & Ellertson, 2004; Calvillo & Lal, 2003; Flores, Ochoa, Briggs, Garcia, & Kroeger, 2003).

In addition, it is common for Hispanic pharmacies to have religious articles, candles and statues, pills, elixirs, herbs, and teas to promote health and prevent disease, as folk medicine still plays an important role in health care for Hispanics (Zaldívar & Smolowitz, 1994). The primary health care providers in the community and the home are women. Older women in particular may be known as folk healers, either *parteras* or *curanderas*, and they provide traditional care regarding illness and health. *Curanderismo* is often closely related to the practice of religion.

Among *curanderas*, the practice of medicine relies on the notions of “hot” and “cold” and the intrinsic qualities of particular situations and foods (Eggenberger et al., 2006; Spector, 2012). A good Hispanic meal, for example, will include the balanced elements of “hot” and “cold” types of food and herbs. Hispanics use food to return balance to health. The qualities of “hot” and “cold” have nothing to do with the temperature of the food. Rather, these ideas refer to the characteristics of the food itself (Eggenberger et al., 2006; Spector, 2012). Those who ingest foods whose temperatures are inaccurate or imbalanced for those individuals may result in illness. In Hispanic culture, good health is represented by a good appetite. Children do not have to eat foods they do not like because families respect their preferences. A food preparer will remove a food from her child’s diet if she thinks it causing illness. The knowledge of these harmful foods is carried through the generations, along with other beliefs about food (CDC, Office of the Associate Director for Communication, 2016). Understanding common cultural beliefs and values that thread through the groups will help provide a context for understanding factors that may influence the development of preventative tailored intervention of obesity.

## Parental Influences on Obesity

Parents influence childhood obesity from conception to adolescence. During these years, children learn about weight status, diet quality, and food choices. Parents play an important part in their children’s behaviors around food, through both genetics and the environment. These influences can be determined but not limited to family acculturation, parenting styles, the parents’ food preferences, feeding practices, role modeling, food purchaser, food preparer, food provider, and the maternal role in the family.

### Parenting and Acculturation

Parenting may also be affected by acculturation. Less-acculturated parents are more controlling and have stricter styles of parenting (Nichols et al., 2006). The acculturating process may be different for parents and children. Children tend to acculturate faster, creating an acculturation gap between themselves and their parents, which may cause conflict between the parents and children (Hernández & Charney, 1998).

**Parenting Styles and Obesity**

Parenting styles can significantly affect children's health. Parent child-feeding styles and practices may contribute to obesity (Hughes, Shewchuk, Baskin, Nicklas, & Qu, 2008). As described by Dewar (2010), parenting styles have been categorized into four different types and two dimensions: demandingness and responsiveness. Demandingness is described by parent control and supervision, while responsiveness refers to parent involvement, affect, and acceptance (Arredondo et al., 2006; Hughes et al., 2008). Parenting styles described by Hughes et al. (2008) include authoritative (high demandingness and high responsiveness), authoritarian (high demandingness and low responsiveness), permissive (low demandingness and high responsiveness), and neglectful (low demandingness and low responsiveness). Each parenting style has unique dietary tendencies. Authoritarian parents dictate the children's behavior and stress obedience to authority while discouraging discussion. Authoritative parents set limits and rely on natural consequences for children to learn from their own mistakes, reason with their children, and consider the children's point of view even though they may not agree. Authoritative parents are firm but express kindness, warmth, and love. Permissive parents are accepting and warm but exert little control (Bowne, 2009; Doak, Visscher, Renders, & Seidell, 2006). Permissive parents do not set limits and allow children to set their own rules and schedules and activities. Uninvolved parents demand little and respond minimally and appear uninterested in the needs of the child. In extreme cases, a permissive parenting style might entail neglect and rejection (Bowne, 2009).

Studies have reviewed the relationship between parenting styles and obesity (Epstein et al., 2001; Hughes et al., 2008; James, 2004; Savage et al., 2007; Sussner et al., 2008). Hughes et al. (2005) describe more positive child outcomes associated with authoritative parenting styles than with other styles. Positive eating behaviors and lower BMI tend to be associated with an authoritative parenting style. Authoritarian styles are associated with negative child-feeding outcomes and higher BMI (Hughes et al., 2005). Savage et al. (2007) research described children of authoritarian mothers as being four times more likely to be overweight than those whose mothers were authoritative. Arredondo et al. (2006) found that parents' use of appropriate disciplinary styles was positively related to children's healthy eating.

Parent control was positively related to children's unhealthy eating. Controlling parenting behaviors can adversely affect children's inner cues regarding the amounts they eat. Savage et al. (2007) studied a group of children 3 to 5 years old and their abilities to self-regulate. Results indicated that children with a greater store of body fat were not as able to regulate energy intake accurately. Studies (Perez-Escamilla et al., 2008; Savage et al., 2007) found that parental control in feeding was the best way to predict a child's regulation of energy intake. Children who had a lessened ability to self-regulate energy intake had mothers who were more controlling of their children's food intake (Savage et al., (2007). It was concluded that the optimal situation would be for parents to offer healthy food choices but to allow their children to decide how much they consume (Savage et al., (2007). Savage et al. (2007) found that stringent controls from parents can cause children to accept only limited foods and can disrupt a child's self-regulation of food intake.

Savage et al. (2007) found that among low-income Hispanic parents, an authoritarian child-feeding style was associated with lower intake of fruits and vegetables by preschool-aged children. Among low-income Hispanic parents of preschoolers, Hughes et al. (2008) found that 38% of parents were authoritarian and 38% were indulgent compared with 15% who were authoritative. Sanchez and Karp (2000) examined parenting styles among Mexican, foreign- and native-born Mexican-American and non-Hispanic White parents of 10- to 14-year-old children; the research found that Mexican-American parents exhibited greater use of authoritarian practices than Mexican or non-Hispanic White parents. It speculated that use of the authoritarian parenting style may be a response to the effects of acculturation.

Arredondo et al. (2006) found there were some gender differences between parenting styles. Girls tended to eat unhealthier food when their parents used a controlling parenting style regarding eating. Researchers examined fathers' involvement specifically and found that fathers who have permissive or disengaged parenting styles were more likely to have overweight children. Those fathers whose parenting style was consistent, including clear limit setting, were less likely to have an overweight child

(Arredondo et al., 2006). In addition, Arredondo et al. (2006) examined parenting styles in relation to children's healthy eating and physical activity among a sample of Hispanic parents with young children. Healthier eating was associated with positive reinforcement and monitoring by parents, and less healthy eating was associated with controlling parent's behaviors (Epstein et al., 2001; Hughes et al., 2008; James, 2004; Savage et al., 2007; Sussner et al., 2008). Parents who were less controlling tended to be more acculturated (Elder et al., 2010)

Parents can be influential for obese children who have difficulty losing weight. Although there are many factors affecting obesity, one factor may be the interaction between parents and their children. Story, Holt, and Denise (2011) noted that one of the most common barriers was lack of parental involvement. In addition, parenting styles of Hispanic Americans may change as women enter the workforce and utilize convenience foods and more technology during meal preparation. Lastly, Hispanic mothers may change from breastfeeding to formula feeding, which forms the beginning patterns of nutrition in children (Arredondo et al., 2006). Few studies have examined parenting styles and child-feeding behaviors among ethnic/racial minorities (Larson & Story, 2015).

**Parents as Role Models**

Role modeling is an important aspect of parenting that may affect nutritional intake with children (Ayala et al., 2007; Golan & Crow, 2004; Kosa-Postl, 2006). Parents are influential on children's eating patterns and habits, and their child-feeding behaviors affect children's nutrition (Golan & Crow, 2004; K. S. James et al., 2008). Eating patterns and habits develop at a young age; these patterns continue for a lifetime and have lasting health consequences. Therefore, it is important to examine the association between parent and child caregiver acculturation on obesity.

Rozin and Schiller (1980) studied Mexican families and found that older family members modeled eating chili-flavored foods; this in turn made it easier for children to accept these hot foods. Greenberg, Ariza, and Binns (2010) state that children were more likely to eat new foods when adults were also eating them and more likely to try new foods when their mother offered it to them than when a stranger offered the food. Patrick and Nicklas (2005) found that strategies employed by low-acculturated Hispanic mothers to encourage preschool-aged children’s healthy eating included role modeling, providing incentives to reinforce good behavior, introducing children to new foods, and preparing foods creatively.

Parents influence obesity in their children by modeling feeding behaviors and creating a learning environment surrounding food patterns. In the Hispanic population, parental involvement may play a major role in treating childhood obesity. Parents control an integral part of treatment and outcomes, including transportation to and from treatment, food availability in the household, meal preparation, and setting good behavioral examples. Despite the acknowledgement of the importance of parental influence on successful childhood weight management, relatively few studies have examined the specific parental factors that influence pediatric obesity, particularly in the Hispanic population. Research examining particular parental factors may offer insight into successful pediatric obesity treatments. In particular, interventions specifically using a family-based approach to childhood weight management may benefit from research on parental factors associated with childhood obesity. Aside from parents, other family members influence the presence of childhood obesity in several ways, including the weight of family members, their eating habits, and their level of physical activity (Epstein et al., 2001; Savage et al., 2007; Sweeney, Glaser, & Tedeschi, 2007).

## Family Roles: Food Purchaser and Meal Preparer

Parents may influence dietary patterns and habits as food purchaser and food preparer. Parents are important in determining nutritional intake and physical activity habits in early childhood (Jackson, Mannix, Faga, & McDonald, 2005), and they shape the attitudes and behaviors children develop in relation to food and construct the family mealtime environment (Golan & Crow, 2004; Jackson et al., 2005). Parents control the type and amount of food available to their children (Beauchamp & Moran, 1982; Institute of Medicine. Committee on Dietary Guidelines Implementation, 1991; Jackson et al., 2005).

### Food Purchaser

One unique aspect of this proposed study is that it will examine the role of food purchaser as a variable, which may influence obesity status. There is little empirical research in the literature base specific to this role within the family. Naturally, the foods one selects are partly contingent on the economic resources available. Low incomes are associated with childhood obesity primarily through a lack of access to food resources. The ability to obtain healthy foods for a child and the resources to participate in regular physical activity are largely contingent on a family's income. Pearson, Biddle, and

Gorely (2009) showed that in a sample of children in Minnesota, 28% did not consume an adequate amount of fruit and 38% of children had an insufficient vegetable intake. However, when fruit and vegetable intake was divided by socioeconomic status (SES), 40% of children from lower SES categories had both inadequate fruit and vegetable intakes. In addition, Pereira, Kartashov, Ebbeling, Van Horn, Slattery, Jacobs, and Ludwig, Pereira, (2005) indicated that, because of low financial resources, families of lower SES need to purchase food more efficiently. Therefore, families purchase foods higher in energy intake (e.g., sugar and fat), which are cheaper than foods such as fruits, vegetables, and whole grains.

On the other hand, there are other factors, such as time, that may influence food purchases. In many Hispanic families, one or both parents are working full time or part time, and work reduces the amount of time parents spend at home. This absence may result in a decrease in the number of family meals prepared and consumed together. Because of time constraints, some families have resorted to consuming fast foods and eating dinner while watching television (Freedman et al., 2005). Parental involvement is identified as critical in obtaining favorable outcomes from interventions directed at obtaining a sustained weight management in children (Jackson et al., 2005; Myers & Vargas, 2000).

Finally, Ayala et al. (2008) research demonstrated that Hispanic consumers prefer fresh, high-quality fruits and vegetables, low prices, and convenient location as a top priority in deciding where to shop. In addition, the researchers found that the Hispanic participants preferred to communicate in Spanish. Food selection and where one shops may also depend on a person’s level of acculturation and whether Spanish is spoken or traditional food items and spices are available for sale (James, 2004; Romero-Gwynn & Gwynn, 1997).

**Food Preparation**

The role of food preparation must be taken into account when determining how diet contributes to overweight and obesity within a family. Unhealthy eating behaviors may be supported by cultural practices, which influence food preparation and cooking methods. Koplan et al. (2005) looked at the relation of the dietary consumption of fruits, vegetables, and fats to obesity in a group of 204 Hispanic males who lived in the Southern United States. The Brief Dietary Scale for Selected Food Intake and Preparation was administered to individuals between the ages of 40 and 70 years who were attending an education and screening program for prostate cancer. Participants in this cross-sectional study self-reported their frequency of intake of fruits, vegetables, and fat, as well as their weight and height. Thirty-four percent of respondents were overweight, while 47% were obese. Many of the men reported consuming fried foods, including chicken (81%) and fish (67%), and one-third of the men did not remove the skin when preparing chicken. Most of the participants used butter on such foods as grits (92%) and bread (79%), while nearly one-fifth (19%) cooked vegetables with butter. Almost three-quarters (71%) of respondents regularly used salad dressing, and about one-third (32%) dressed potatoes with sour cream, margarine, or butter. Seventy percent consumed skim or low-fat milk, while 62% ate low-fat cheese. Only 29% ate cooked vegetables at dinner, while even fewer (16%) had cooked vegetables with lunch. More than three-quarters of the men (77%) consumed fruit primarily while snacking, but the consumption of fruit juice was extremely high (90%). Davison and Birch (2001) suggested that ease of food preparation contributed to easier and greater consumption, particularly in relation to snacks. Although this research study is not assessing food preparation methods, many factors may influence food preparation. The parent/child caregiver may be one of the most important factors influencing obesity in Hispanic families. In addition, limited research has been conducted on acculturation and food preparation.

**Meal Preparer**

Blankenau, (2009) notes that opportunities for eating well are not isolated individual and family decisions but are reflective of social, cultural, environmental, and economic forces that structure choice. Food choices are embedded within the structure of the food system, including food producers, food procurers, food providers, and food preparers. Families can only eat as healthy as their food system allows. In many countries, the female of the household is the person who is usually responsible for preparing meals. In a family-centered Mexican society, food is prepared usually by the mothers/wives (Kittler & Sucher, 2012). Little research has been conducted on the food preparer of acculturated Hispanic families and the food preparer’s affect on obesity in the United States.

**Maternal Affect on Obesity**

Dietary patterns are passed down from generation to generation; the health of a mother may mediate the physical condition of her children while molding their relationship with food/dietary intake. Maternal influence begins prior to conception (Pak-

Gorstein, Haq, & Graham, 2009). A woman's BMI may pose risks not only for the mother but also for the baby from gestation throughout the child's lifespan. Evidence shows that excessive pregravida weight has a consistent effect on childhood weight status, impairs the process of breastfeeding, and increases a child's risk of metabolic syndrome (Daniels & Greer, 2008; Fisler & Warden, 2006; Hossain et al., 2007; Kaiser, 2006; Mercado & Fileti, 2010; Sundaram, Zeitler, & Nadeau, 2009). A mother may acquire gestational diabetes, hypertension, and preeclampsia, which are challenges frequently encountered by Hispanic women (Catalano, 2007). Additional research is needed to determine if a mother's BMI encodes a child to experience lifelong disease or whether the obesogenic environment of a household is a primary determinant.

Several studies have shown that the obesity rate in preschool children is greatest among Hispanics. Nearly two-thirds of all childbearing Hispanics are foreign born (Elder et al., 2010; McDowell, Fryar, Ogden, & Flegal, 2008; Savage et al., 2007). Given this, Sussner et al. (2008) highlighted the importance of a mother's influence on the weight of preschoolers by assessing the BMIs and acculturation levels of a large sample of low-income mother–child pairs. Research found overweight and obesity to be prevalent among the preschoolers with elevated pediatric BMI, correlating to younger, less-educated mothers. Hispanic mothers who were less acculturated were more likely to breastfeed, which has been shown to protect against obesity later in life (Sussner et al., 2008). The lack of knowledge and maturity among less acculturated Hispanics may impair their abilities to raise a healthy child through the traditional practice of breastfeeding. In similar research, Kimbro, Brooks-Gunn, & McLanahan (2007) argued that traditional Hispanic culture is a potential detriment to a child's weight. An evaluation of ethnic differentials in BMIs in 3-year-olds found that pediatric obesity was closely linked to an overweight mother due to household nutrition, exercise, and genetic factors. In a sample of Black, White, and Hispanic low-income, urban families, 35% of children were overweight or obese (CDC, 2010a). Hispanic children were twice as likely to be overweight or obese when compared to other ethnic groups (Mazur et al., 2003; Sussner et al., 2008). In addition, there is an association among high birth weights, feeding habits, and mother weight (Kimbro et al., 2007). Not all Hispanic parents/child caregivers have the same beliefs and practices where traditional medicine is concerned; these beliefs evolve with acculturation. It is crucial to understand the practices that adult Hispanic parents/child caregivers engage in and provide to ensure a healthy family.

**Acculturation and Family Beliefs About Weight**

A family's health beliefs and child-feeding practices may affect a child's body weight. Some Hispanics believe fatness is linked to health and thinness is equated to being sick (Contento, Basch, & Zybert, 2003). The cultural opinion that a chubby child is a healthy child is common among less-acculturated Hispanic mothers (Snooks & Hall, 2002). This principle may lead to the increased provision of food, in spite of a child's satiety. Kimbro et al. (2007) shared similar insights after finding that Latina mothers were more accepting of the weight status of heavier children. Kimbro et al.'s (2007) study evaluated 250 kindergarten students consisting primarily of Mexican-American immigrants. One-quarter of the children were obese; however, only 40% of mothers correctly identified their children as obese. This trend may prevent mothers from implementing measures to reduce the rate of weight gain among their school-aged children. Conversely, acculturated mothers were more likely to have daughters who chose thinner figures as the ideal body size, highlighting Americans' unrealistic standards of physical appearance (Taylor et al., 2000). The role of acculturation in family beliefs in Hispanic families remains unclear. This study may provide insight on the affect of acculturation on family beliefs in the Hispanic family, which may lead to further research.

## Dietary Guidelines for Americans

The USDHHS and the U.S. Department of Agriculture (USDA) review, update, and publish the Dietary Guidelines for Americans (DGA) every five years; the first edition was released in 1980 (USDA & USDHHS, 2010). In 1985, the USDHHS and the USDA appointed a Dietary Guidelines Advisory Committee (DGAC) consisting of national experts in the field of nutrition and health, whose role was to review scientific and medical knowledge to assure currency (USDHHS, 1985). The USDA Dietary Guidelines for Americans 2010 provides core principles for people 2 years of age and older to develop healthy lifestyles based on individual needs, likes, and dislikes related to both eating and physical activity. The Dietary Guidelines focus on choosing from a variety of nutritious foods, reading food labels, and being more physically active to meet nutrition requirements, promote health, and reduce risk of chronic disease (USDA & USDHHS, 2010). The information in the DGA helps develop materials used in education. In addition, it helps policymakers design and implement programs related to nutrition, including those at the federal level pertaining to food, food information, and nutrition education. Further, the Food and Drug Administration Modernization Act (FDAMA) allows the DGA to make authoritative statements regarding food and nutrition (USDA & USDHHS, 2010, p. ix). The DGA recommendations encompass two umbrella concepts, which are to focus on consuming nutrient-dense and nutrient-rich food and beverages and to maintain a calorie balance over a period of time in order to achieve and sustain a healthy weight (USDA & USDHHS, 2010). The DGA 2010 Key Recommendations are the most important part of the guidelines in terms of improving public health (USDA & USDHHS, 2010, p. ix). The Key Recommendations categories are building healthy eating patterns; food and food components to reduce; balancing calories to manage weight; and foods and nutrients to increase (USDA & USDHHS, 2010, p. ix).

As described in the NWS section of Healthy People 2020, an American healthful diet includes consumption of many different types of foods that are dense in nutrients, both within each food group and across all food groups. The food groups are: fruits and vegetables; whole grains; sources of protein, especially lean meats; and low-fat or fat-free milk products. This diet also includes a limitation of caloric intake to meet calorie needs of the specific individual (HealthyPeople.gov., 2015b).

**Fruits, Vegetables, Grains, Protein, Fat, and Sugar**

Nutrient-dense foods and beverages enrich a diet with substances such as vitamins and minerals that positively affect nutrition without adding many calories. The term *nutrient dense* indicates that the nutrients are “whole,” that is, they have not been “diluted” by added calories from starches, sugars, and solid fats. Nutrient-dense foods and beverages are low in solid fats, or “lean,” and contain few if any added sodium, starches, sugars, or solid fats. Nutrient-dense foods include beans and peas, whole grains, fruits and vegetables, eggs, seafood, unsalted nuts and seeds, lean meats and poultry, and low-fat and fat-free milk and milk products, when they are prepared without the addition of sugars or solid fats (USDA & USDHHS, 2010, p. 35).

The best approach to achieving nutrient needs within the calorie requirements of healthy dietary patterns is to take in the recommended amounts of nutrient-dense foods from each food group. In June 2011, MyPlate replaced MyPyramid to provide practicable and practical information to the food industry, nutrition educators, health professionals, and individuals to assist consumers in adopting healthy eating habits that are in line with the 2010 Dietary Guidelines for Americans. MyPlate depicts a place setting with a plate and glass divided into five food sections (Figure 12) containing approximately 30% grains, 30% vegetables, 20% fruits and 20% protein and a smaller circle representing a dairy serving such as low-fat/nonfat milk or a yogurt cup. Other suggestions from MyPlate are to make half the plate fruits and vegetables, consume one-percent or skim milk, make half the grains whole, consume a variety of proteins, control portions, and reduce intake of sodium, sugar, and saturated and trans fats (USDA & USDHHS, 2010). A diet that is high in vegetables and fruits has been shown to relate to a decrease in the incidence of mortality from chronic diseases including stroke, diabetes, cardiovascular disease, obesity, hypertension, diabetes, and certain cancers (Epstein et al., 2001; Mathieson & Koller, 2006; Robinson, 2008; Sealy, 2010; Tester, 2009).

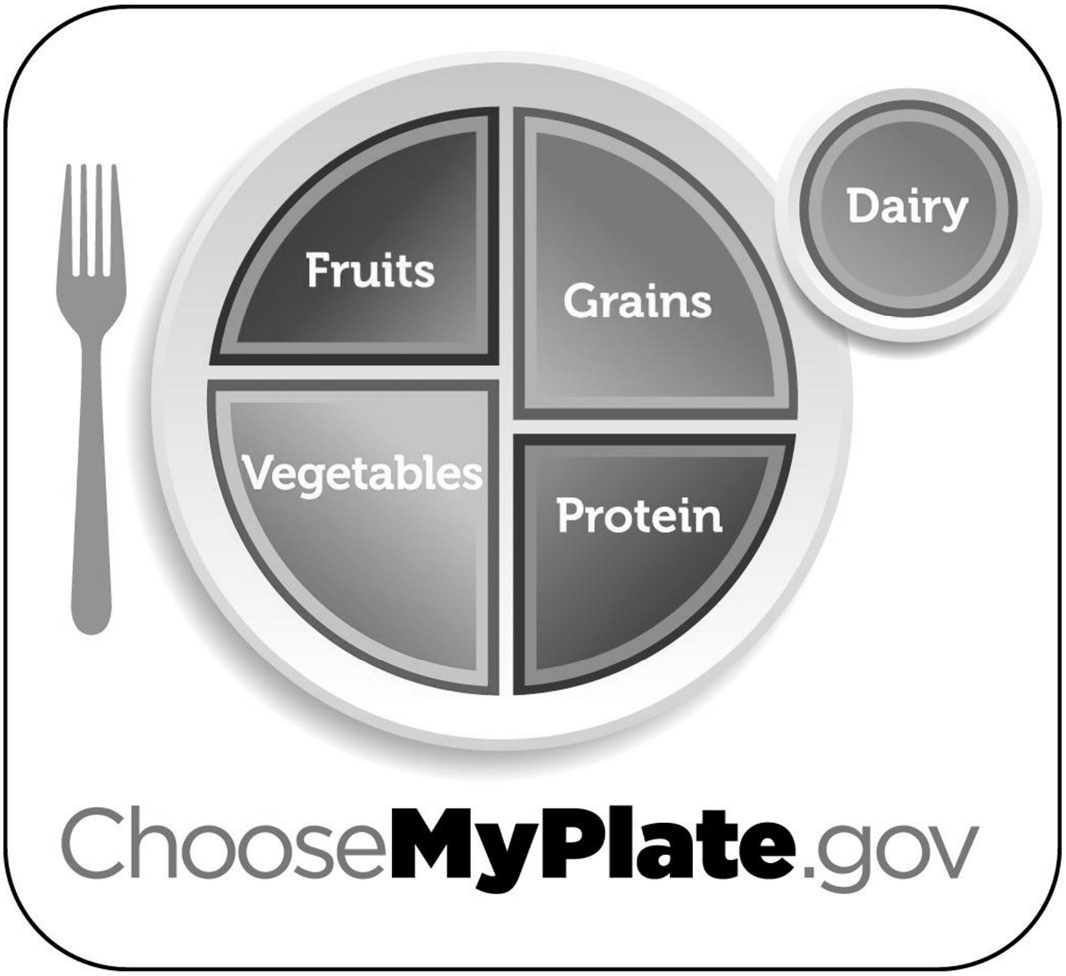



*Figure 12*. A diagram showing MyPlate. Adapted from www.choosemyplate.gov.

**Calorie Requirements**

A number of factors determine the total number of calories that a person needs each day. These factors include the person's level of physical activity, gender, age, height, and weight. Adult women are estimated to need anywhere from 1,600 to 2,400 calories per day, while adult men need an estimated 2,000 to 3,000 calories per day (USDA & USDHHS, 2010, p. 13). Young children need an estimated 1,000 to 2,000 calories per day, and the estimate for older children and adolescents ranges from 1,400 to

3,200 calories per day, with boys requiring more calories than girls (USDA & USDHHS, 2010, p. 13). Utilizing the Dietary Guidelines and maintaining healthy eating patterns at an appropriate calorie intake level is advised for managing weight.

Even though evidence is plentiful that a diet rich in vegetables and fruits is beneficial, most Americans do not eat anywhere near the recommended amounts (Elder et al., 2010; Robinson, 2008). Nearly nine-tenths (89%) of Americans do not consume the USDA's recommended amount of vegetables and fruits. According to NHANES 2005–2006, among Americans 2 years and older, the top 10 sources of calories are: desserts based on grains; breads made from yeast; chicken and dishes made from chicken; soda and energy or sports drinks; pizza; alcoholic beverages; pasta and dishes made from pasta; tacos, burritos, and tortillas; beef and dishes made from beef; and dairy desserts. NHANES 2005–2006 states that women older than age 19 take in an average of 1,785 calories, and men in the same age group take in an average of 2,640 per day. (USDA & USDHHS, 2010, p. 11).

**Fruits and Vegetables**

The Dietary Guidelines for Americans (2010) recommend that Americans consume more fruits and vegetables for three reasons (USDA & USDHHS, 2010). First, a number of under-consumed nutrients, including dietary fiber, potassium, magnesium, folate, and vitamins A, C, and K, are found in fruits and vegetables (USDA & USDHHS, 2010, p. 35). Second, eating vegetables and fruits relates strongly to a reduced risk of many chronic diseases. Third, most vegetables and fruits, when they are prepared without the addition of sugars or fats, are relatively low in calories. In addition, fruits and vegetables provide an important source of dietary fiber (USDA & USDHHS, 2010, p. 39).

**Fat**

Dietary fats can be found in food sourced from plants and animals. Fats are a source of both calories and essential fatty acids, which aid the body in absorbing the fat-soluble vitamins A, D, E, and K (USDA & USDHHS, 2010, p. 24). The Dietary Guidelines for Americans (2010) recommend acceptable ranges for fat intake from total calories for children and adults: children from the age of 1 to 3 years should receive 30% to 40% of their total calories from fat; children and adolescents from the age of 4 to 18 years should receive 25% to 35% of total calories from fat; and adults from the age of 19 years should receive 20% to 35% of total calories from fat (USDA & USDHHS, 2010, p. 24).

Fatty acids fall into four categories: trans, saturated, monounsaturated, and polyunsaturated. Saturated fatty acids tend to come from animal fats, while monounsaturated and/or polyunsaturated fatty acids come from plant sources. Trans fats are for the most part artificially manufactured. Most Americans do not consume enough fats from plant sources; on the other hand, they consume far too much saturated and trans fatty acids (USDA & USDHHS, 2010, p. 15). In addition, fats are far higher in calories than other calorie sources, providing 9 calories per gram compared to 4 calories per gram for carbohydrates and proteins. The American diet contains an average of 11% of calories from saturated fatty acids, higher than recommended by the USDA (USDA & USDHHS, 2010, p. 25). Most fats that contain a high percentage of trans or saturated fatty acids are referred to as “solid fat” because they maintain solidity at room temperature (USDA & USDHHS, 2010, p. 27). Solid fats contribute nearly one-fifth (19%) of calories to the American diet; further, they offer no dietary fiber and few essential nutrients (USDA & USDHHS, 2010, p. 27). Solid fats in the American diet come from such sources as pizza, grain-based desserts, sausage and franks, regular cheese, ribs and bacon, and fried white potatoes (USDA & USDHHS, 2010, p. 26). Research has shown that the type of fatty acid in the diet is more important to health, particularly to the risk of cardiovascular disease, than is the total amount of fat consumed (USDA & USDHHS, 2010, p. 24).

**Sugars**

Sugar is a simple carbohydrate that has three main dietary types: sucrose, lactose, (milk and milk products) and fructose (fruits) (McGuire & Beerman, 2006). Most sugars in the American diet are added at the table or during preparation or processing (USDA & USDHHS, 2010, p. 27). Added sugars may include brown or white sugar, raw sugar, corn syrup and corn syrup solids, maple and other pancake syrups, high-fructose corn syrup, malt syrup, liquid fructose and other fructose sweeteners, crystal and anhydrous dextrose, and honey molasses (USDA & USDHHS, 2010, p. 27). These sugars are responsible for an average of 16% of all calories in the American diet (USDA & USDHHS, 2010, p. 27). The American Heart Association recommends that women consume no more than six teaspoons, 100 calories or 25 grams, in added sugar and men no more than nine teaspoons, 150 calories or 37.5 grams (American Heart Association [AHA], 2015c). For the U.S. population ages 2 years and older as defined in the NHANES 2005–2006, the top three sources of added sugars in the diet are sport and energy drinks and soda; fruit drinks; and grain-based desserts (USDA & USDHHS, 2010, p. 28).

Because of changes to industrial agriculture in the United States, high-fructose corn syrup (HFCS) is now widely used as a food additive. Based on data from the USDA, the consumption of HFCS in the United States increased 1,000% between 1970 and 1990, representing the largest increase for any one food over this time period. HFCS is the only sweetener used in sodas, and it makes up four-tenths of all sweeteners by number of calories used in both beverages and foods. There is evidence that added sugar intake causes the following health conditions: obesity, high blood pressure, heart disease, and type 2 diabetes (AHA, 2015).

**Dietary Patterns in the United States: Breakfast, Snacks, and Fast Food**

Over centuries, American meal patterns have varied from region to region; determining factors may include an individual's social class, occupation, ethnicity, gender, and personal preferences. Weekly responsibilities, holidays, and seasons determine when meals are eaten (Olver, 2000). All meals tend to be structured events, whether they are eaten at home or elsewhere (Olver, 2000). During colonial times, meal patterns in the United States mirrored practices learned in Europe, where meals took place three times a day and in which the entire extended family took place. The typical meals were breakfast, dinner, and supper (Patel & Hu, 2008). Breakfast was served either immediately after waking or several hours later, after some work had been performed. Working men and schoolchildren came back home for the day's primary meal, which was dinner, usually sometime in the afternoon. The final meal of the day, supper, was occasional and light.

Traditional meal patterns began changing in the middle part of the nineteenth century because of urban growth and changing work patterns for American men. Dinner was the first significant change. As urbanization occurred, workers found it harder to go home for a midday meal because they had farther to travel between home and work. The day's primary meal, dinner, shifted to the evening, when families could sit and eat together. The midday meal came to be known as lunch, a quicker, often rushed, small, light meal. Men would frequently bring lunch from home in a brown bag or tin pail or have a quick meal in a nearby dining establishment or the workplace cafeteria. Common lunch foods came to include soups, sandwiches, and salads. The American meal pattern changed again after World War II, as snacking became more prevalent (Olver, 2000).

**Breakfast**

Breakfast is considered to be the most important meal of the day, offering nutritional, cognitive, and health benefits to the body (August et al., 2008; Satia-Abouta, 2003; Tanski, Garfunkel, Duncan, & Weitzman, 2010; Taras, 2011). The importance of breakfast for weight status lies in its contribution to nutritional adequacy and dietary behaviors. By consuming breakfast, children and adolescents attain a high proportion of total daily energy for which consuming other meals cannot compensate (Tyler & Horner, 2008). Studies (Elder et al., 2010; Magnusson, Hulthén, & Kjellgren, 2005; Mathieson & Koller, 2006; Sealy & Farmer, 2011) have determined that the total daily energy intake of breakfast consumers is higher than that of non-breakfast consumers. In addition, high-energy intake at breakfast has been associated with lower BMI. Children and adolescents who skip breakfast are likely to have poor diet habits that may promote the development of obesity. Non-breakfast consumers are linked to increased frequency of eating snacks and reduced incidence of having meals, habits associated with gain in weight. Meal frequency in children was found to be inversely related to BMI, while females who snacked more had higher fat intakes, which contributed to an increase in body weight. Yet a recent review of literature concerning breakfast patterns suggests the rate of skipping breakfast among children and adolescents is at its highest, ranging from 10% to 30% depending on age, gender, and ethnicity (Gordon-Larsen, 2003; Speiser et al., 2005; Sweeney et al., 2007).

Additional findings by Pearson et al. (2009) shed light on other factors that contribute to overweight and obesity in children's breakfast patterns. Mechanisms through which family characteristics can influence breakfast patterns are family dinner, family connectedness, providing particular breakfast foods, parental breakfast consumption, mother's role modeling, home rules towards breakfast, and parental involvement. According to Pereira et al. (2005), non-resident father involvement increases the frequency of children consuming breakfast.

Weisman et al. (2008) reviewed the effect of parent and family environment on breakfast. The analysis revealed overwhelming evidence about the effect of family structure on breakfast. In general, children who come from two-parent families are more likely to consume breakfast compared to those from non-traditional homes (Biro et al., 2001). This could be due to limited parental control over the meal pattern in the non-traditional homes. Different community and societal factors (school nutritional and physical programs, neighborhood safety, availability, and access to recreation facilities, convenience food, and restaurants) can affect breakfast patterns. However, research regarding the affect of these factors on breakfast is limited.

**Snacks**

Snacks are identified as foods ingested at times other than meals (Crites & Aikman, 2005; Olver, 2010; Suskind, 2009; Tanski et al., 2010). Although small, frequent meals and portions are advantageous in weight loss, snacking is not comparable to small meals. A study of young adults ages 19 to 29 found that from 1977 to 1996 the frequency of snacking increased, which increased the overall number of calories consumed daily (Young et al., 2006). Sugar consumption was shown to be highest with snack consumption (Ayala et al., 2008; Elder et al., 2010; 2005; Stang & Story, 2005; Thompson & Subar, 2013; Voelker, 2007). Little research has been conducted on snacks and relationship to obesity. This may be partially related to the unclarity between what occurs during snacking and mindful snacking.

**Fast Food**

On the other hand, there is a concern with regards to fast food consumption and obesity. Meals not prepared at home include restaurant meals, fast food, takeout, and delivery. Eating away from home occurs for many reasons, especially for special occasions, the desire to avoid cooking, or lack of time for meal preparations due to busy work and active schedules. However, consuming fast food is associated with poorer nutrition, including increased intake of fat and sugar and decreased intake of fiber (Duffy et al., 2007; National Institutes of Health, 1998). In addition, restaurant portion sizes have increased over time.

Children's characteristics of age and gender have been found to be important predictors of differences in fast food consumption among children and adolescents (Cullen, Watson, & Fithian, 2009; Mathieson & Koller, 2006; Pérez-Escamilla & Putnik, 2007; Whelan, Russell, & Sekhar, 2010). Rhee, De Lago, Arscott-Mills, Mehta, and Davis (2005) found that fast food consumption among children aged 4 to 19 years increases significantly by age, especially in males. This is attributed to adolescents having increased autonomy, more disposable income, greater access to fast food establishments due to employment, and increased exposure to fast food advertising. Reidpath, Burns, Garrard, Mahoney, and Townsend (2002) found other personal characteristics that might sway fast food consumption, including television viewing, student employment, preferences for unhealthy food, playing on a sports team, concern about one's weight, and use of weight control techniques. However, Rogol, Clark, and Roemmich (2000) found the latter two factors are applicable specifically to females. The influence of parental and family characteristics on fast food consumption is linked to the availability of unhealthy food at home, peers' concern for eating health food, and a mother's encouragement to eat healthy food. In both of the studies, teens whose home environment provided unhealthy foods were more likely to consume fast foods. In the study by Reidpath et al. (2002), with the exception of the availability at home, all factors were more significant for males.

Fast food store availability and proximity of location and availability of vending machines in the neighborhood and school are among the major community factors associated with increased fast food or drink consumption among adolescents. Children residing within one block of a convenience store are more likely to have a higher BMI (Akresh, 2007; Galvez et al., 2009; Koplan et al., 2005). Increased consumption may also be due to reduction in the price of fast food. Children who are in areas promoting price reductions are more likely to consume fast foods.

Another factor attributed to variation in fast foods consumption is fast food advertising on television. Freedman et al. (1999) determined that fast food is the most frequently viewed food product category, comprising 23% of all food-related advertisement geared toward adolescents. Berg, Buechner, Parham, and Weight Realities Division of the Society for Nutrition Education (2003) found that children and adolescents who watched television more frequently were significantly more likely to consume commonly advertised fast foods, which included soft drinks, hamburgers, and French fries.

During 2007 to 2010, adults consumed an average 11.3% of their daily calories from fast food (Fryar & Ervin, 2013). Easy access to foods outside the home that are high in energy density (fast foods), a trend that is associated with Western cultures, continues to spread to other cultures around the world as developing economies accelerate. These developing countries are undergoing a significant increase in both overweight and obesity as typically Western fast foods penetrate the local food cultures. As weight status increases in these countries, so does the percentage of calorie consumption from fast food

(Fryar & Ervin, 2013). Research pertaining to fast food consumption, adolescents, and body weight status has a range of issues, a majority of them being environmental, including store proximity, store access, availability and costs, sedentary behavior (specifically television viewing), and family characteristics, including parental practices and home environment.

**Family Meals**

In the United States, family meals are associated with numerous social, psychological, and health benefits for both parents and children (Anderson & Whitaker, 2010; USDA & USDHHS, 2010; Washington, 2008). Meals are social events and are a method for families to honor tradition. Cultural values, eating behaviors, and food preferences are learned through family meals. Studies report that food and meals allow immigrant parents to share religious and traditional customs of their native culture with their children. Family meals provide an opportunity for family bonding, story sharing, and problem solving (Kumayika, 2001; Francis & Birch, 2005; Sussner et al., 2008). Studies have shown that children who belong to families who eat together frequently have improved nutritional status (Jackson et al., 2005; Robinson, 2008; Savage et al., 2007; Sealy, 2010). Young and Nestle (2002) described that eating family meals is pertinent to an increased consumption of healthful foods. There is a direct relationship between family meals and intake of fruits, vegetables, and numerous beneficial nutrients including fiber, calcium, iron, and vitamin C (Ogden & Carroll, 2010) as well as decreased fat intake (Sharkey et al., 2012). Family meals also seem to reduce intake of soft drinks in youth (Berg et al., 2003). Families that eat meals together may have a better understanding of or stronger motivation for health behaviors (Harris, Gordon-Larsen, Chantala, & Udry, 2006), as well as overall healthier food environments and an increased availability of healthful foods, although limited data exists examining this relationship (Powell, Spears, & Rebori, 2010).

It is accepted that the frequency of family meals is coupled with better dietary consumption. However, this belief may assume meals are home prepared; such meals are generally more healthful than meals purchased outside the home. Despite the advantages of family meals, the incidence is decreasing in the United States. Meals prepared at home may be made from convenience items or pre-packaged foods that are high in fat and sodium. According to parents, barriers to eating with families include busy schedules, working parents who find it difficult to manage meal organization, and demands of their family (Gance-Cleveland et al., 2009; James, 2004). Families often rely on restaurants, fast foods, and convenience foods, which leads the daily nutritional intake to contain food with a decrease in nutritional value (Harris et al., 2006).

**Characteristics of Traditional Hispanic Nutritional Intake**

Today, U.S. Hispanics eat a diet that is influenced by both their traditional food cultures and food culture of the places they currently live. Many regional differences exist among the subgroups of the Hispanic population, in terms of both the food in the diet and how it is prepared. In spite of the widely varied heritage of Hispanic Americans, many continue to consume standard food items that are traditional to the Hispanic diet. These food items include grains and beans and a reliance on fresh vegetables and fruits. The importance of family maintains primacy in Hispanic culture, and this emphasis is exhibited in the food culture through the preparation of meals at home and the practice of families eating together. In the Hispanic community, there exists a cultural importance on family gatherings centering on large and social meals.

**Hispanic Staples**

Although Hispanic Americans belong to many different subcultures, their cooking styles have some commonalities. *Chorizo*, or meat sausage, is a primary part of the Hispanic diet. It is often eaten with *salsas*, or sauces. The main ingredients in salsa, and many other Hispanic dishes, are hot chili peppers, whether they are ground, dried, or fresh. The many types of chilies include poblano, malagueta, jalapeño, and habanero. In addition, corn, beans, rice, and root vegetables are staples of the Hispanic diet. Some of the root vegetables typically used in Hispanic food preparation are yams, sweet potatoes, jicama, yucca, taro, Jerusalem artichokes, and a pear-shaped squash called chayote. Other names for chayote include tayote, chuchu, and xuxu. Hispanics enjoy many fruits that are native to their home countries, which are now readily available in the United States. These fruits include guavas, plantains, papayas, mangoes, prickly pears, and passion fruit (Heise, 2002). Vegetables are usually part of the main dish and include potatoes, greens, tomatoes, and onions (Heise, 2002).

Turnovers, dishes that consist of a variety of doughs and fillings, are very popular in Hispanic cooking. Two popular turnovers are empanadas and tamales. Bolos, chuchitos, nacatamales, and humitas are just among the many types of tamales found in the Hispanic diet in the United States. Most Hispanic desserts are made from dairy products, including flan, a type of custard. Most traditional Hispanic drinks contain two of the following three ingredients: milk, rum, or fruit.

Information regarding Hispanics' dietary intake in the United States comes from data that has been accumulated by national surveys conducted by the USDA. This data shows that Hispanics tend to eat less ready-to-eat cereals and pasta, but more rice, than their non-Hispanic White counterparts (Van Rompay et al., 2012 & Variyam, 2000; Heise, 2002; Mercado & Fileti, 2010; Unger & Schwartz, 2012). Hispanics consume slightly more fruits but are less likely to eat vegetables. Compared to non-Hispanic Whites, Hispanics are considerably less likely to drink skim or low-fat milk but more than twice as likely to consume whole milk. In addition, the use of traditional foods tends to diminish with each generation, resulting in a decreased consumption of lard, cream, and sausage, but an increased intake of fast food, sweetened beverages, and commercial snacks (Satia-Abouta, 2003). In addition, the Mexican-American diet consists of liquids that contain sugar, a major contributor to high body fat and increased weight gain. In addition, it was found that calcium, iron, vitamin A, folic acid, and vitamin C are lacking in the Mexican and Hispanic-American diet, which can be traced back to a lack of dairy, leafy green vegetables, and fruit (Freedman et al., 1999).

## Hispanic Second-Generation Dietary Consumption and Obesity

Pereira et al. (2005) found that second- and third-generation Hispanics had a poor nutritional diet compared to first-generation Hispanics. First-generation Hispanics reported healthier dietary patterns and greater consumption of fruits and vegetables than second- and third-generation Hispanics (Guendelman & Abrams, 1995; Liu, Chu, Frongillo, & Probst, 2012). On the other hand, U.S.-born Hispanics consumed greater energy from fast food, snacks, desserts, sweetened beverages, fat, and sodium than foreign-born Hispanics (Lytle et al., 2006; Rhee et al., 2005). In addition, second generations reported higher BMI percentiles than the first and third generations, leading Hispanic communities to a greater risk for obesity (CDC, 2012).

## Environmental Barriers

As defined by *Collins English Dictionary*, environment is the aggregate of things, conditions, influences, or all external factors affecting a person and the social and cultural forces that shape the life of a person or population (Collins English Dictionary, 2009). This study will measure environmental factors with the variables food purchaser and food preparer. However, an understanding of an all-encompassing environment will assist in understanding obesity in the Hispanic family. The "obesogenic environment" may influence today's generation more than older generations (Newby, 2007). The obesogenic environment refers to an environment that promotes, aids, and contributes to weight gain and obesity (Powell et al., 2010). In addition, this environment is not conducive to weight loss within the home or workplace (Swinburn, Eggar, & Raza, 1999).

Human-made factors known as the "built environment" may contribute to obesity risk. These factors include the distribution, placement, and characteristics of metropolitan areas and the residences and neighborhoods within them. Nineteenth-century urban reform movements gave rise to modern urban planning and the notion of public health. These concepts sought to lessen the negative affects of industrialization, urbanization, and immigration. The reforms led to automobile-focused transportation systems, low-density land uses, and decentralization, which in the latter half of the 20th century turned into the pattern known as urban sprawl. Several studies have shown a relationship between urban sprawl and the risk of obesity. (Duderstadt, 2009; ICF International, 2007; Koplan et al., 2005; Lara et al., 2005; National Institutes of Health, 1998; O'Grady & Capretta, 2012; Satia-Abouta, 2003; Sharkey et al., 2011; Teran et al., 2002; Tester, 2009; USDHHS, n.d.)

Transportation may foster and hinder the consumption of healthy foods. Several research studies (CDC, 2011a; Elder et al., 2010; James, 2004; Satia-Abouta, 2003; Tyler & Horner, 2008; Whelan, Russell, & Sekhar, 2010) have demonstrated that having easy access to transportation may foster the consumption of healthy foods. However, based on a recent focus group conducted among overweight children, lack of transportation may be the major barrier to healthy eating and the leading cause of high weight gain (USDA, 2009). In addition, proximity and availability of a supermarket has shown to be a positive predictor of fruit and vegetable consumption. Those who reside closer to a supermarket may consume significantly more fruits and vegetables than those who reside five or more miles away from a supermarket (USDA, 2009). However, less than half of the households sampled owned a car, and car ownership positively correlated to a lower intake of fruits and vegetables (Ghaddar et al., 2010; Levi et al., 2013). BMI of car owners are significantly higher than non-car owners (Biro et al., 2001). Some specific socioeconomic factors that determine an individual's dietary intake are transportation, employment, participation in government programs like Food and Nutrition Services (FNS), and the number of people living in a household. Although the food purchaser and food preparer may be determinants of obesity, little is known of is their affect on food availability in the family’s environment/home. The access to transportation will not be measured in this research study, which may be a limitation.

**Food Insecurity**

The extent to which a community can provide adequate food for a healthy diet is called “food access.” The USDA has defined four categories of food security: 1) High food security is observed when there is easy access to food; 2) marginal food security exhibits no change in food intake, but one expresses concern for food shortage; 3) low food security is reduced food quality, variety, or desirability but no change in food intake; and 4) very low food security is indicated by frequent disruption in eating patterns as well as reduced food intake (USDA, 2009). Food insecurity is defined as the situation in which a household does not have the financial means to access sufficient food for all members of the family to sustain an active, healthy lifestyle (USDA, 2009).

In 2008, 26.9% of Hispanic households were food insecure. Some negative effects of food insecurity are poor dietary quality and poor health outcomes. In a household, these effects are particularly evident among children, women, and the elderly. Specifically, qualitative researchers suggest that in times of severely constrained resources, Hispanic parents may deprive themselves of food to provide their children with food. Most foods consumed during severe instances of food insecurity are of lower dietary quality and lead to obesity. It has been demonstrated that BMI increases as food insecurity increases. Food insecurity is associated with the presence or absence of certain family members in the household. The presence of food insecurity alongside obesity is an evident paradox among low-income earners. Proximity to food stores and the availability of affordable, high-quality both increase food access.

### Food Availability/Food Desert

The presence of supermarkets may affect the risk of obesity (Levi et al., 2013; López-Jaramillo et al., 2008; Tester, 2009). There has been growing concern that certain segments of the U.S. population are prone to unhealthy nutritional intake because of the inability to have access to healthy foods based on where they reside. These areas, usually consisting of predominantly lower-income neighborhoods, are called "food deserts" (Sallis & Glanz, 2009, p. 134). Studies have shown that ease of access to high-quality, affordable food has an affect on better diets and nutrition (Kristal, Feng, Coates, Oberman, & George, 1997; López-Jaramillo et al., 2007; Obayashi et al., 2003) This high-quality food is less likely to be found in convenience stores and more likely to be sold in supermarkets. Families who eat meals that have been prepared with these foods at home, as opposed to foods eaten in a restaurant or purchased pre-made, were more likely to have a reduced risk of obesity. In some neighborhoods in the United States, it is easier to obtain fatty foods than fresh fruits and vegetables. Biro et al. (2001) suggested that diet is improved significantly when healthy food becomes available to poor populations.

## Demographic Factors That May Be Associated With Obesity

Many studies have suggested that demographic factors such as age, gender, income, and education may influence the prevalence of obesity (Davison & Birch, 2001; Gordon-Larsen, 2003; Sharkey et al., 2011; Troiano & Flegal, 1998; Zhang & Wang, 2004).

**Age and Obesity**

The growing problem of obesity is witnessed in the entire U.S. population and is associated with unhealthy lifestyle choices among all age groups. The rise in obesity among adults is mirrored in a similar climb in obesity among children and adolescents. Childhood obesity has become an issue in American society due to unhealthy diets, junk food, inactivity related to television watching, playing video games, and a reduction of physical activities in children's daily lives.

However, early in the growth and development of children, rapid weight gain during the first weeks or months of infancy predicts obesity (Taveras et al., 2009). In addition, studies (National Institutes of Health, 1998; Speiser et al., 2005; Taveras et al., 2009; USDA & USDHHS, 2010) have addressed the association between birth weight and later obesity and found that higher birth weight was associated with higher attained BMI in childhood and adulthood (Taveras et al., 2009). However, future research may be needed to highlight the importance of fetal growth and length of gestation, as well as the various causes of obesity such as prematurity and nutritional or hormonal fetal programming (Taveras et al., 2009).

**Gender and Obesity**

Gender is a factor related to body weight, as body weight is experienced differently by men and women (Davison & Birch, 2001; Sobal et al., 2009; E. D. Taylor et al., 2006; Troiano & Flegal, 1998). Regardless of age or race, women have a higher risk of obesity and overweight than men. Women tend to report poor quality of life as obesity increases, with non-Hispanic White women reporting the largest effects. Women report significantly higher impairment of self-esteem with obesity, even when compared within racial groups. However, men are most likely to report the most impairment in a physical function. Similar to previous NHANES results, when gender and racial/ethnic background were evaluated, specific minority groups had the highest obesity prevalence (Caprio et al., 2008)

**Socioeconomic Status and Obesity**

In 2012, 46.5 million people were deemed by the official definition as poor in the United States (Gabe, 2013). An average family of four fit the official definition of poverty if their pretax cash income for the year was below $23,492 (Gabe, 2013). In 2012, 27.2% of Blacks (10.9 million) and 25.6% (13.6 million) of Hispanic-American families resided in poverty, compared to 9.7% of non-Hispanic Whites (18.9 million) and 11.7% of Asians (1.9 million) (Gabe, 2013). Hispanics represent 17.1% of the population, but account for 29.3% of the poor (Gabe, 2013). The incidence of poverty in the United States varies widely according to educational attainment, age, family living arrangements, area of residence, and labor force attachment.

Although obesity can be caused by genetics, metabolism, behavior, and the environment, the leading cause among low-income families can be attributed to poor diet consumption. Poverty can affect parents’ food choices. Hojjat (2015) found that over the last couple of decades, healthier foods such as fish, fruits, and vegetables have become more expensive compared to high-calorie foods. Low-income families tend to consume cheaper foods that are higher in calories in order to save money. Consuming cheaper foods often limits meats, fish, and fresh fruits and vegetables in the diet, and when available, the variety and the quality of these foods tend to be significantly lower. Stewart & Blisard (2008) found that low-income families spent significantly less on vegetables and fruits than did families with higher incomes.

Hispanic parents/caregivers of lower socioeconomic status tend to consume lower amounts of fruits, vegetables, fiber-rich foods, and dairy products (Newby, 2007). One possible explanation for lower consumption of healthful foods in low socioeconomic status is limited availability of these foods at home and a low number of family meals (Ogden et al., 2010). In addition, the study found that about 19% of all low-income families did not buy any fruits and vegetables on any given week compared to 10% of higher income households. It is reported that a higher proportion of adolescents living in low socioeconomic households consumes more soft drinks, salty snacks, sports drinks, and confectionaries compared to those living in middle or high socioeconomic households (CDC, 2012; Sayer, Bianchi, & Robinson, 2004; USCB, 2007). In the study by Reifsnider, Keller, & Gallagher (2006), researchers found that families relied on supplemental food assistance and food banks to supplement their food supply, and 23% of parents said they ran out of food most months. A limited income for food leads to parents' making more economical food choices and not purchasing more expensive foods such as fruits and vegetables (Let's Move!, 2015a). This research study may describe the food purchaser and his or her relationship to obesity.

**Parent/Caregiver Education and Obesity**

Parental education level also influences the home food environment (Scholder, 2008). By defining the affect of maternal education on family meal patterns, the influence of socioeconomic status can be assessed (Reidpath et al., 2002). Socioeconomic status of Hispanic communities is often defined by the highest level of education of a parent (CDC, 2015d). Hispanic families with middle or low maternal education levels eat more family meals together than those with high maternal education levels; however, these families are also more likely to watch television during family meals (CDC, 2008a). Hispanic parents/child caregivers of lower socioeconomic status tend to consume lower amounts of fruits, vegetables, fiber-rich foods, and dairy products (Newby, 2007). In addition, Hispanic parents/caregivers with the lowest education are more likely to purchase take-out foods for family meals (Powell et al., 2010).

**Nutrition and Physical Activity**

Dietary intake alone can be directly linked to obesity and treatment. Unhealthy diets can promote obesity, while healthy diets prevent, mitigate, and treat obesity. The majority of obese and non-obese adults do not consume healthy diets, and many of them may not try to lose weight (Ogden & Carroll, 2010).

One behavior factor in energy balance that is important in the pathogenesis of obesity and is a contributing factor in its treatment is physical activity. Physical activity is one way to balance energy intake with expenditure to prevent abnormal weight gain and encourage weight maintenance. The American Heart Association (2015b) recommends 75 minutes of vigorous-intensity aerobic activity, 150 minutes of moderate-intensity aerobic activity, or an equivalent combination of the two every week. Research shows that physical activity can assist individuals in maintaining body weight over time (National Institutes of Health, 1998; USDA & USDHHS, 2010). The AHA (2015b) suggests that to lose weight and maintain weight loss, an individual will require a significant amount of physical activity unless that individual also adjusts diet through the reduction of calories. Obtaining a healthy weight requires both healthy nutritional food consumption and regular physical activity.

There is also evidence of a considerable decline in physical activity level during adolescence among children of lower SES. Weisman et al. (2008) suggested that children in the lower SES brackets participate in less physical activity than children in higher SES brackets. Although there is a distinct relationship between SES and physical activity, factors leading to the decline in physical activity in lower SES populations are unclear. Research suggests that children in lower SES brackets who desire to engage in physical activity lack the appropriate resources, such as outdoor parks, recreation facilities, or money. Behaviors and lifestyles are major contributors to the weight status and overall health of the individual. Consequently, understanding children's behavioral patterns might provide opportunities for addressing the current obesity tendencies. Once these behaviors are adopted, they may continue through adulthood, which can affect long-term health and weight status. The optimal management of overweight and obesity starts with a combination of diet, exercise, and behavioral modification.

**The Need for Family-Based Culturally Tailored Nutrition Programs**

Obesity treatment and prevention involves a relatively simple formula of eating less and exercising more (Ebbeling, Pawlak, & Ludwig, 2002). Weight management or treatment programs are complex that may include behavioral interventions, pharmacological treatment, bariatric surgery, or a combination of all these. Behavioral interventions have been the most studied, and they have small to moderate affect on weight but minimal to non-treatment effects. Effective behavior interventions address dietary improvement and physical activity promotion and involve behavioral management principles and/or treatments such as teaching parents and children about goal setting, relapse prevention, problem solving, and managing the environment to encourage a healthy lifestyle (Whitlock, O'Connor, Williams, Beil, & Lutz, 2010). Typically, about half of this weight loss is gained back within a year, and almost all of the weight is gained back in five years' time (Lytle, Murray, Perry, Story, Birnbaum, Kubik, & Varnell, 2004). While designing a successful obesity treatment program for adults proves difficult, the challenges faced when designing an obesity treatment program for children prove even more complex. Factors such as the psychological and intellectual immaturity of children as compared to adults and their predisposition to be influenced by peer pressure (Lytle et al., 2006) pose barriers to successful pediatric obesity treatment. In addition, common barriers to a successful obesity treatment are low patient motivation, a lack of family involvement, and poor support services. In addition to the patient-related barriers, health professionals also have issues that prevent them from providing obesity treatment, such as a lack of reimbursement for childhood obesity treatment programs. One study found that pediatricians who worked in a pediatric obesity clinic were reimbursed only 11% of the time. While childhood obesity affects all ethnicities, Mexican-American children have the highest incidence of obesity among minority children in the United States. This high rate, coupled with relatively reduced access to health care services versus their non-Hispanic counterparts, creates a dire need for public health intervention in this ethnic group.

To create obesity prevention programs that are successful, the relationships between obesity and nutrition/dietary intake, education, gender, age, and acculturation must be addressed in the development of successful nutrition interventions. A coordinated system-wide approach from all sectors of society, including families and individuals, communities, educators, organizations, businesses, health professionals, and policymakers working together through partnership can improve the health of the community.

The SEM provides a framework to illustrate how all components shape an individual's food choices that may lead to obesity. The most effective interventions have been shown to be those involving several components. Using several different components influences diet patterns, including factors like age, gender, income, race/ethnicity, and genetics. In addition, components that been found to effectively improve dietary behaviors include nutrition knowledge, food purchasing behaviors, food availability, financial resources, and cultural attitudes and beliefs. Environmental settings/factors (schools, workplace, faith-based organizations, foodservice and food retails, family eating patterns, and availability of food) play an integral role in affecting individuals' and families' food choices. Communities may be influenced by a many different sectors, including agriculture, media, industry, public health and health care systems, and government. These sectors can be significant in determining how accessible healthy food is to individuals and families in their communities. Social and cultural norms guide individuals' beliefs and behaviors.

As described by Golan and Weizman (2001), a health-centered and family-based focus brings about changes in the environment as well as in the parents' cognition, lifestyle, and parenting practices. Parents are the primary change agents in their conceptual model showing that home environment and family are significant factors that affect the child's activity habits and food. Parents learn to create change in the home by promoting healthy habits in their children, influencing environmental change, and modeling healthy lifestyle behaviors. This approach acknowledges the importance of parents who are maintain an active role in the family and take responsibility for being both an obese child's role model and a source of authority in the family.

## Conclusion

Although there is extensive research on variables that influence obesity as detailed in this chapter, a gap remains in the literature for research that uses a socioecological framework to examine variables associated with obesity within Hispanic communities and among Hispanic parents and caregivers. Results from this study will help to support current U.S. and local obesity prevention programs and campaigns and provide information that would help to develop family-tailored interventions for Hispanic populations. It is imperative that public health educators and program planners working to reduce obesity among Americans do not apply a "one size fits all" approach when planning interventions. Understanding the culture of health, beliefs, attitudes, and values of a target audience; developing education programs within the context of those perceptions; and utilizing a more collective, family-based approach may lead to positive and sustainable outcomes. In addition, this study is unique in that it examines the potential affect of the roles of food purchaser and food preparer within the family unit and how these roles may influence other family members' weight status. Chapter 3 outlines the survey methodology and instrumentation, issues pertaining to the protection of human participants, and treatment of the data.

# Chapter 3: Research Methodology

## Introduction

The purpose of this correlational and predictive study was to determine whether select socioecological and sociodemographic factors are associated with obesity among Hispanic parents/child caregivers (18 years of age and older) who reside in Aurora, Illinois. The theoretical framework for the research method described in this chapter is based on the SEM. In this chapter, I will provide an overview of the following: research questions and hypotheses; the study variables and measures; the study design and approach; the study sample; sampling methods; procedures for data collection; instrumentation; procedures for data analyses and steps that were implemented to protect the rights of study participants and a plan for disseminating the results.

## Research Questions

This study was guided by three research questions and 10 hypotheses, which are listed below:

1. What is the relationship between gender, role as food planner/preparer, role as food purchaser, and obesity among Hispanic parent/child caregivers in Aurora, Illinois?
2. What is the relationship between acculturation, intake of saturated fats, intake of fruits, intake of sugars, and intake of vegetables?
3. What combination of sociodemographic factors such as gender, acculturation, intake of saturated fats, intake of sugars, intake of fruit, intake of vegetables, role

as food purchaser, and role as food planner/preparer reliably predict obesity in Hispanic parent/child caregivers in Aurora, Illinois?

## Hypotheses

*$H_1$:* *$H_{o1}$:* The is no relationship between gender and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

*$H_{a1}$:* The is a relationship between gender and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

*$H_2$:* *$H_{o2}$*: There is no relationship between the food purchaser or who are not the food purchaser and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

*$H_{a2}$*: The food purchaser is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

*$H_3$:* *$H_{o3}$:* There is no relationship between the food planner/preparer or who are not the food planner/preparer and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

*$H_{a3}$:* The food planner/preparer is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

*$H_4$:* *$H_{o4}$:* There is no relationship between acculturation and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

*$H_{a4}$*: Acculturation is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

*$H_5$:* *$H_{o5}$:* There is no relationship between dietary intake of saturated and trans fats and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a5}$: Dietary intake of saturated and trans fats is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_6$: $H_{o6}$: There is no relationship between dietary intake of sugar and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a6}$: Dietary intake of sugar is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_7$: $H_{o7}$: There is no relationship between dietary intake of fruits and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a7}$: Dietary intake of fruits is negatively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_8$: $H_{o8}$: There is no relationship between dietary intake of vegetables and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_{a8}$: Dietary intake of vegetables is negatively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

$H_9$: $H_{o9}$: There is no relationship between acculturation, intake of saturated fats, intake of fruits, intake of sugars, and intake of vegetables.

$H_{a9}$: There is a significant relationship between acculturation, intake of saturated fats, intake of fruits, intake of sugars, and intake of vegetables.

$H_{10}$: $H_{o10}$: All of the independent variables: acculturation; gender; dietary intake of saturated and trans fats, sugar, and fruits and vegetables;

role as food purchaser; and role as meal planner and preparer are not predictors of obesity among Hispanic parent/child caregivers in Aurora, Illinois.

*$H_{a10}$:* At least one of the independent variables: acculturation; gender; dietary intake of saturated and trans fats, sugar, and fruits and vegetables; role as food purchaser; and role as meal planner and preparer is a predictor of obesity among Hispanic parent/child care givers in Aurora, Illinois.

## Study Variables and Measures

This study contained eight independent variables, which included (a) acculturation, (b) gender, (c) dietary intake of saturated fats, (d) dietary intake of sugars, (e) dietary intake of fruits, (f) dietary intake of vegetables, (g) role as food purchaser and (h) role as food planner/preparer. Income level has already been established in a myriad of empirical studies spanning decades as having a significant positive association with obesity and socioeconomic status (Braveman et al., 2010; Chatterjee et al., 2005; Najman, Toloo, & Siskind, 2006; Speiser et al., 2005; Vieweg, Johnston, Lanier, Fernandez, & Pandurangi, 2007; Wallace et al., 2010; Zhang & Wang, 2004). Obesity is the single dependent outcome variable. Table 1 illustrates each variable type and the instrument that was used to be measure each variable.

Table 1

*Variable Types*

| Variables | IV or DV | Type of data | Instrument |
|---|---|---|---|
| Acculturation | IV | Continuous (sum score) | Short Acculturation Scale for Hispanics: BAS |
| Gender | IV | Dichotomous (male/female) | Demographic survey |
| Dietary intake of saturated fat | IV | Continuous (sum score) | Block Screener |
| Dietary intake of sugar | IV | Continuous (sum score) | Block Screener |
| Dietary intake of fruits | IV | Continuous (sum score) | Block Screener |
| Dietary intake of vegetables | IV | Continuous (sum score) | Block Screener |
| Role as food purchaser | IV | Dichotomous (yes/no) | Demographic survey |
| Role as meal planning/preparer | IV | Dichotomous (yes/no) | Demographic survey |
| Obesity | DV | Dichotomous (yes/no) | Demographic survey<br>BMI = weight (lb)/[height (in)]$^2$ × 703 |

*Note.* IV = independent variable; DV= dependent variable, BAS= Bidimensional Acculturation Scale

## Research Design and Approach

In this correlational and predictive cross-sectional design study, I employed an anonymous survey to measure the predictors associated with obesity in Hispanic parents/child caregivers. English and Spanish versions of paper-based surveys were distributed to Hispanic parents/child caregivers residing in Aurora, Illinois, at select venues. Quantitative research is the best approach to test a theory when the researcher seeks to identify the factors that influence an outcome and to understand the best predictors of the outcomes (Creswell, 2009, p. 18). According to Creswell, the survey design provides a plan for the "quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population" (Creswell, 2009, p. 145; Shaughnessy, Zechmeister, & Zechmeister, 2015). Survey research is a beneficial method when collecting data for the purpose of describing a population that is too large to directly observe (Babbie, 2012). Researchers are able to use this information to generalize or make inferences about the population (Creswell, 2009). A postpositivist perspective is the perfect method for this study because the research is aimed to identify and assess the factors that influence obesity in Hispanic parents and child caregivers in Aurora, Illinois.

As mentioned above, this quantitative study utilized a cross-sectional survey design to collect data to measure the predictor variables to obesity in the Hispanic parents/child caregiver in a single point in time (Frankfort-Nachmias & Nachmias, 2007, p. 116). A cross-sectional study is relatively cost effective and may be brief in duration of time (Frankfort-Nachmias & Nachmias, 2007, p. 116). Although convenient, cross-sectional studies have an inherent limitation in that they do not provide a good basis for establishing causality. Cross-sectional research designs have several limitations which include an inability to establish cause and effect, an inability to establish a temporal relationship, and a lack of control over the independent variables (Trochim and Donnelly, 2008). In addition, other variables that are not being measured may affect the relationship between the variables but not affect the individual variables.

The nature of this study is correlational, a predominant research design in social sciences often identified with survey research (Frankfort-Nachmias & Nachmias, 2007, p. 116). Correlational studies are used to examine relationships, or the associations between properties and dispositions between two or more variables (Triola, 2014; Trochim & Donnelly, 2008). Although, correlation does not imply causation, variables must be correlated in order to have predictive power (Babbie, 2012). Correlational studies exhibit three types of patterns of relationships: (a) no relationship, (b) positive relationships, and (c) negative relationships (Triola, 2014; Trochim & Donnelly, 2008). No relationship infers that there is no association between any variables, in that one does not affect the other (Triola, 2014; Trochim & Donnelly, 2008). A positive relationship infers that an increase or decrease in one variable is associated with a parallel increase or decrease in another variable, while a negative relationship infers that an increase in one variable is associated with a decrease in another and vice versa (Triola, 2014; Trochim & Donnelly, 2008). Further, the researcher must consider whether a non-spurious variable affected the relationship (Babbie, 2012). A spurious relationship is “a coincidental statistical correlation between two variables shown to be caused by a third variable” (Pearl, 2009;

Babbie, 2012, p. 91). Correlational studies often provide the foundation for true experiments, and this study may be a springboard for future research.

Moreover, this study used predictive (multiple logistic regression) analysis to further investigate variables that may increase likelihood of obesity among Hispanic parents and child caregivers. Predictive research involves the forecasting of the likelihood of a phenomenon on the basis of hypothesized, general relationships. Multiple regression enables the researcher to assess the relationship between a dependent (predicted) variable and several independent (predictor) variables (Tabachnick & Fidell, 2012). The end result of multiple logistic regression is the development of a regression equation (line of best fit) between the dependent variable and several independent variables. In standard multiple logistic regression, all predictor variables are sequentially entered into the regression equation at one time. The rationale in this study for utilizing multiple logistic regression is to determine the best combination of independent (predictor) variables to predict the dependent (predicted) outcome variable.

## Survey Design and Face-to-Face Surveys

I used three surveys to collect the data for this study. There are many benefits of a self-administered survey, which may include: economy, speed in data collection, lack of interviewer bias, and possibility of anonymity and privacy to encourage candid responses on issues. Survey design is useful in describing the characteristics of a large population, making a self-administered survey more feasible with large samples (Babbie, 2012, p. 276). Surveys provide flexibility in analysis by developing operational definitions from actual observations (Babbie, 2012). Surveys also provide uniformity to all subjects by asking the exact same questions with the same meaning to all subjects and having to impute the same intent to all respondents giving a particular response (Babbie, 2012). Steps will be taken to ensure that the participants understand the questions and have a choice to complete the Spanish or English version of the surveys. Finally, distributing surveys face to face that are written in one's native language aligns with culturally competent research approaches and embraces the cultural value of personalismo, or personalization. In addition, an electronic version of the instrument may not allow for everyone to access the survey, and there are currently no English/Spanish versions of the instruments in electronic format.

On the other hand, survey research has several weaknesses. First, standardized questionnaire items represent the least common denominator in assessing people's attitudes, orientations, circumstances, and experiences and may miss what is most important to participants (Babbie, 2012). Surveys are limited in providing a social context: what the respondents are thinking, acting, or saying (Babbie, 2012). A survey researcher may not be aware of the importance in the event of a new variable (Babbie, 2012). In addition, surveys are subject to artificiality; the topic of the study may not be amenable to measurement through questionnaires, and the respondent may have given no thought prior to the survey (Babbie, 2012). On the other hand, survey research introduces response biases that influence the response of the participants away from an accurate or truthful response. This bias can be induced by a number of factors, which may be related to the fact that human subjects do not respond passively to stimuli, but rather actively integrate multiple sources to provide a response. Surveys may introduce a recall bias, which is when a participant's memory may have a distortion or inaccuracy of past events to respond to the survey with perfect accuracy (Delgado-Rodriguez, 2003). Lastly, the Hawthorne effect is a bias that the researcher should consider during the analysis of the results. The Hawthorne effect is when participants modify their behavior when they are aware that they are part of a research study. The researcher attempted to minimize the Hawthorne effect by providing privacy to the participants and by limiting communication between the researcher and the study participants that may influence participant's responses (Triola, 2014).

## Barriers to Research among Hispanic Populations

As described by Marin and Marin (1991), there are specific barriers for researchers attempting to implement surveys among Hispanic populations. Some of these barriers include: language, compensation, instrument format, and legitimacy. It is important to provide an accurate translation that uses culturally appropriate language. Respondents are not likely to participate if the translation is unprofessional, culturally inappropriate, or difficult to read. To overcome the language barrier, these surveys will be administered in English and Spanish. However, the Spanish version of the Block "Alive" Screener survey will be subject to human error. The Block "Alive" Screener survey will require the researcher to transcribe the responses to a Scantron for statistical analysis. This transcribing method is required due to the lack of a Spanish version of a scannable form for analysis. To avoid subjective ratings by the researcher, two other individuals will also examine the responses that will be transcribed. Responses that were different during transcription were tripled checked by an additional individual.

Another barrier, which is a barrier for survey research among all populations, is response rate. To achieve at least 200 participants, a modest gift card compensation ($5.00) will be provided by the researcher in attempt to increase participation from the intended population. In addition, trust, or lack thereof, may be a barrier for conducting research with ethnic minority populations. This researcher, over the past five years, has worked within the community of Aurora and with many programs or churches that are facilitated by Hispanic adults; one such initiative is the Healthy Living Council in Aurora. This researcher's employment and service in the community provided legitimacy of the research within the Aurora community and among Hispanic groups.

Language can also be a barrier for conducting research among diverse populations. Providing surveys in the native language of Spanish may provide some legitimacy to the survey for the participant. A Spanish, minimal reading level format for individuals is an important component to achieve cooperation from Hispanic participants. It is important that participants can understand what is being asked to be able to respond to the questions honestly and appropriately. Details of the study, including the way the data will be utilized, the confidentiality of the survey, and the legitimacy of the researcher, were provided within the consent form.

## Sample and Setting

Purposive and venue-based volunteer sampling were also used to recruit participants. Eligibility requirements for the sample participants included (a) be 18 years of age or older; (b) reside in Aurora, Illinois; (c) be and/or identify themselves as Hispanic-American; (d) identify themselves as a parent and/or child caregiver; and (e) be able to read, write, and understand English. Participants were able to self-select into the research study. An eligibility requirement flier was distributed to all community leaders at various data collection sites. Community leaders at the sites distributed fliers to the potential participants, who then were able to self-select into the study after reading the flier and inclusion criteria. The demographic survey also provided data to assist the researcher in determining which surveys met the inclusion criteria. Participants were recruited from various community sites where Hispanics are known to gather in Aurora, Illinois. Community sites included Latina Talk and Tea meetings which are in Aurora, Illinois (see Appendix C).

After the collection of the data, only the completed surveys that met the inclusion criteria were used in the data analysis. Based upon the answers that the participants placed on the demographics survey, only the surveys in which all of the inclusion criteria were completed and correctly marked were used for data analysis.

**Purposive Sampling**

Purposive sampling is primarily based upon the knowledge or judgment that the researcher possesses regarding the sample population (Babbie, 2012; Singleton & Straits, 2009). In summary, the researcher serves as the "expert judge" to select participants that are representative of the sample population (Babbie, 2012; Singleton & Straits, 2009, p. 133). According to Singleton and Straits (2009), purposive sampling is an acceptable technique to utilize when studies are more limited in scope and when random sampling is not a feasible alternative. However, purposive sampling is dependent upon the researcher's knowledge of the population. Hence, if the researcher is not knowledgeable about the sample population, the sample may be incorrectly or inaccurately drawn (Babbie, 2012; Singleton & Straits, 2009; Trochim & Donnelly, 2008). An additional weakness of purposive sampling or non-probability sampling is that it is subject to selection bias (Singleton & Straits, 2009).

**Volunteer Sampling**

Volunteer sampling is a form of case selection that is purposive rather than based on principles of random or probability sampling. This sampling involves recruiting individuals/respondents based upon those who agree to participate and/or are willing to be included in a research study (Jubb, 2006; Trochim & Donnelly, 2008). This type of sampling is most often used for research that is geared toward a specific population, rendering random sampling useless (Jubb, 2006). However, limitations of this approach include the facts that (a) true representativeness may be difficult to establish as self-selecting participants of the survey tend to be atypical of the population (Gerstman, 2008); (b) findings may not be generalized to the entire population or to the population of interest; and (c) volunteers may participate in the research only to gain some type of actual or perceived benefit (Jubb, 2006).

**Venue-Based Sampling**

The venue-based sampling method seeks to recruit respondents/participants in places or settings at a time where the target population congregates and further to recruit a sample within those venues that meets study eligibility requirements (Muhib, Lin, Stueve, Miller, Ford, Johnson, Smith, and Community Intervention Trial for Youth Study Team, 2001). To ensure a systematic sample, the research needs to understand the target population's attendance habits at those venues and their likely responses (eligible or not eligible) of a participant (Muhib et al., 2001). Among the Hispanic-American community, the values of familia (family), community, and fe (faith) are important to consider when selecting research venues for data collection. Therefore, Hispanic churches, community groups, parent organizations, and health fairs provide venues that support the Hispanic Americans residing in Aurora. The venues may be arenas where Hispanic Americans can congregate with other Hispanics, discuss family, understand their interests, formulate collective interests, and formulate beliefs and attitudes.

**Sample Size**

Calculating sample size with multiple logistic regression via the use of power analysis is a challenging task requiring several assumptions on the part of the researcher regarding odds ratio, knowledge of R-squared, and/or distribution. Sample size determination for this study is based on power, effect size and significance level. This researcher utilized G*Power 3.1.0 version (Faul, Erdfelder, Lang, & Buchner, 2007) to determine the minimum number of participants needed for this study for multiple regression analysis. G*Power is a stand-alone power analysis program, available free of charge through the Internet for many statistical tests used in the social, behavioral, and biomedical sciences (Faul et al., 2007). Statistical power is the probability that a given statistical test will detect a relationship between variables. This requires a large enough sample to ensure a likelihood of detecting a difference or a relationship if it exists in the population. A high statistical power aids in the likelihood that the findings are not due to chance. For the second value, alpha, a larger value for alpha provides a greater opportunity to reject the null hypothesis. If the power analysis determines that a researcher has enough participants for multivariate analysis, then the researcher will have sufficient participants for bivariate analysis (Katz, 2013, p. 77). Lastly, the effect size provides how “strong” the relationship is between the two variables. The square of the correlation coefficients measures the effect size. Effect size conventions for G*Power analysis 3.1.0 version are small effect size (f2 = 0.02), medium effect size (f2 = 0.15), and large effect size (f2 = 0.35). For multiple regression analyses, if up to eight predictor variables are tested at an effect size of 0.15 (medium) at an alpha of 0.05 and power of 0.80, a minimum of 125 participants are required (Cohen, Cohen, West, & Aiken, 2003; Faul et al., 2007). This researcher utilized G*Power version 3.1.0 for sample analysis for multiple regression analysis for eight predictors, the results are as follows: total sample size = 109, critical $F$ = 2.03, Lambda = 16.35, F-test in multiple regression a priori analysis, accuracy mode, effect size $f^2$ = 0.15, alpha = 0.05, and power = 0.80. The results for the sample size calculations are that at least 109 participants are needed to achieve the selected power. Results are provided in the output table below (Table 2).

Since there are conflicting views on the best strategy to determine a sample size for multiple logistic regression (Demidenko, 2008), I chose to an additional formula mentioned by Hosmer, Lemeshow and Sturdivant (2013) to confirm the results of my G*Power analysis. According to Hosmer, Lemeshow and Sturdivant (2013), 10 cases per independent variable are sufficient to run a multiple logistic regression with moderate power. This research study includes 10 hypotheses, which include eight independent variables. The following depicts the calculation of the sample size using the Hosmer, Lemeshow and Sturdivant (2013) approach: 10 (# of cases per independent variable) x eight (the independent variables in the regression model) = 80. However, I strived to over-sample and recruit at least 200 participants in order to compensate for participants that may have decided to withdraw from the study and minimize problems with missing data.

Table 2

*Output of G*Power Analysis for Minimal Sample Size*

| | |
|---|---|
| Sunday, May 10, 2014 | |
| *F* test - Linear multiple regression: Fixed Model, $R^2$ deviation from zero | |
| Input: Effect size | = 0.15 |
| Alpha | = .05 |
| Power | = .80 |
| Number of predictors | = 8 |
| Output: Noncentrality parameter | = 16.3500000 |
| Critical *F* | = 2.0323276 |
| Numerator *df* | = 8 |
| Denominator *df* | = 100 |
| Total sample size | = 109 |
| Actual power | = .8040987 |

## Procedures for Recruitment Participation

After obtaining approval from the Walden University Internal Review Board, participants were solicited from various locations of the Latina Talk and Tea events/meetings from December 17, 2014, until February 28, 2015. Approximately 25 participants were recruited at each event/meeting. I recruited 229 participants. The number 229 reflects oversampling which accounted for ineligible survey forms, incomplete surveys, or participants who did not meet the inclusion criteria. Potential participants were provided material regarding the survey through fliers at the various sites (e.g., community meetings, community leaders' meetings). A recruitment flier (Appendix H) describing the study was distributed to the various sites prior to data collection and at the data sites during actual data collection activities.

After achieving a sufficient number of sites, the researcher set up dates and times approved by key personnel (community leaders) at the data collection sites (e.g., community organization) to administer the survey. The researcher distributed surveys at the data collection sites. Potential participants were asked if they would like to participate in the research study and were provided with information on how they could complete the hard copy of the surveys. The researcher was onsite at the locations on the selected data collection days to provide information about the survey to those who were interested and to provide blank surveys as well as information tables and nutritional educational materials. There was also a question on the surveys that inquired if participants were of Hispanic-American descent. An additional question on the survey asked the participant's specific ethnicity/birth place/ancestry (e.g., Mexico, Puerto Rico, and Central America). Lastly, before the survey was issued, participants were asked four questions to ensure that they met eligibility requirements. These included: (1) Are you Hispanic? (2) Are you 18 years of age or older? (3) Do you reside in Aurora, Illinois? and (4) Are you a parent/child caregiver?

**Procedures for Data Collection**

Data were collected by way of anonymous paper-based surveys. Participants were assigned a unique numerical identification number, which were pre-printed on the surveys. Participants read the flyer and were then able to self-select into the study based on the inclusion criteria that was presented on the flyer. Participants who wished to complete the survey completed the survey in the designated area/room on site. The survey had attached the cover letter/consent, the survey, and educational materials on nutrition and obesity. A table with chairs was up in the room or area on the site that contained the consent/cover letter, survey, nutrition brochure and handouts, pencils, envelopes, and the lock box into which the surveys were deposited.

The consent attached to the survey informed the participants that completion of the survey signified their informed consent to participate in the research and provided instructions for how participants obtained the $5.00 Walmart gift card after completing the survey. After the participants completed the survey, they were instructed to seal the completed survey in a white envelope and place the survey in a lock box located at the data collection site. Only the researcher had a key or access to the key to the lock box. After the participants dropped their surveys in the lock box, they then collected the gift card from the researcher. Because the surveys were sealed in a white envelope, the researcher was unable to determine if survey was completed; subsequently, all participants received a $5.00 Walmart gift card for their participation. The entire survey took approximately 20 to 30 minutes to complete.

The survey was anonymous in nature, as participants did not place their name on the survey. However, the researcher was face to face with the participants during the distribution of survey material. A description of the study, as well as the risks, benefits, and time involved was attached. On the survey is the statement, “Completion of this anonymous survey signifies your informed consent to participate in this research.”

**Incentives**

Participants who agreed to participate in the study were issued a $5.00 Walmart gift card since non-response and incomplete surveys can affect the validity of the study results. The gift card was offered as an incentive for participants’ time and effort taken to complete the survey. According to Cho, Johnson, and Vangeest (2013), even offering small to modest monetary incentives can increase research participation for paper-based surveys, and offering incentives is a legitimate way to increase participation in survey based research. In addition, I provided healthy snacks onsite along with a healthy choices presentation after the completion of the participation in the research study. The healthy choices presentation provided an additional incentive and an opportunity for finding out more about the research study and studies in the literature review.

## Instrumentation

This study utilized three quantitative instruments. A description of each is provided below.

**Demographics Survey**

A demographics questionnaire was distributed to capture data on age, gender, education, socioeconomic status, marital status, food purchaser, and food planner/preparer weight and height. Participants were also asked to self-identify their ethnicity (i.e., Hispanic and residing in Aurora, Illinois) in order to verify that those completing the surveys were Hispanic adult men and women (Appendix D). The demographics questionnaire contained a total of 13 questions. The frequency of the demographic data is presented in the results in Chapter 4.

**Bidimensional Acculturation Scale for Hispanics**

The BAS, developed by Marin & Gamba (1996) in 1996, was used to measure acculturation (Appendix E). The scale can be utilized with Mexican Americans and Central Americans (Marin & Gamba, 1996). There are two major cultural dimensions (Hispanic and non-Hispanic), and each response category includes four items on a Likert-type scale. Participants read each of the 24 statements listed on the scale and then circle the number that best describes their frequency about each statement. The two cultural dimensions: Hispanic and non-Hispanic, consists of 24 statements, 12 items in each domain, which measure three areas related to language. The first subscale, Language Use, includes items that measure the frequency of use of Spanish or English when speaking and thinking. The second subscale, Linguistic Proficiency, includes six items referencing the respondent’s ability to speak, read, understand, and write English and Spanish. The third subscale, Electronic Media, comprises three items referencing the frequency with which the respondents utilize Spanish and English music, television, and radio.

The BAS respondents had two scores: (a) one assigned to the average of the items in the Hispanic domain (items 4–6, 13–18, and 22–24); and (b) a second score assigned to the average of the items in the non-Hispanic domain (items 1–3, 7–12, and 19–21). The response categories for items 1–6 and 19–24 are (1) almost never; (2) sometimes; (3) often; and (4) almost always are items. The response categories for items 7–18 are very poorly (1); poorly (2); well (3); and very well (4). The total score ranges from one to four in both of the cultural domains. These two scores define each respondent's level of acculturation (Marin & Gamba, 1996). The researcher may assign acculturation categories to the respondents (Marin & Gamba, 1996). A score of 2.5 is utilized as a cut-off to indicate whether adherence to each cultural domain is high or low. A score less than 2.5 on either of the 12-item domains indicates low acculturation to that culture. A high score greater than 2.5 on either of the domains indicates high acculturation to that culture. In both domains, a score higher than 2.5 indicates that the respondent is bicultural. An individual scoring above 2.5 in both domains would be considered to have high biculturalism. A low score on the White domain and a high score on the Hispanic domain suggest high acculturation to the Hispanic culture and low acculturation to White culture.

The scores from the BAS show moderate-to-high internal consistency and valid coefficients and reliability (Marin & Gamba, 1996). An alpha coefficient was calculated for each cultural domain, Hispanic and non-Hispanic. Overall, the subscales show internal consistency; the range of alpha coefficient is equal to 0.97 for the Linguistic Proficiency component in the non-Hispanic domain to an alpha coefficient equal to 0.60

for the Celebrations component in the Hispanic domain. Among the language-related subscales, the lowest internal consistency is Electronic Media, for which the alpha coefficient is equal to 0.81 for the Hispanic domain and equal to 0.83 in the non-Hispanic domain. The combined score for all of the subscales demonstrated a high internal consistency for both domains, with alpha coefficient equal to 0.87 for the Hispanic domain and is equal to 0.94 for the non-Hispanic domain. Further, the combined score of the three language related subscales with alpha coefficient is equal to 0.96 for the non-Hispanic domain and 0.90 for the Hispanic domain. The respondents with national ancestry from Mexico and Central America have high alpha coefficients. The subscale score of the language items exhibited the highest internal consistency for Central Americans, with alpha coefficient equal to 0.95 for the non-Hispanic domain and an alpha coefficient equal to 0.87 for the Hispanic domain, and Mexican Americans with alpha coefficient equal to 0.97 for the non-Hispanic domain and alpha coefficient equal to 0.93 for the Hispanic domain.

The BAS subscales and composite scales have concurrent validity with the criteria of other previously developed acculturation scales (Coatsworth, Maldonado-Molina, Pantin, and Szapocznik, 2005; Cuellar, Arnold, and Maldonado, 1995; Cuellar, Harris, and Jasso, 1980; Marin & Gamba, 1996). The two combined domain scores and the subscales used seven criteria: length of time living in the United States, generational status, age at arrival in the United States, formal educational attainment, ethnic identification, how much of the respondent's life had been lived in the United States, and self-identification, showing construct validity. Convergent validity is evident as both the non-Hispanic and Hispanic domains of the BAS demonstrate a correlation with the Short Acculturation Scale for Hispanics -0.64 for the Hispanic domain and 0.79 for the non-Hispanic domain (Marin & Gamba, 1996).

In summary, the BAS allows researchers to measure acculturation level by cultural dimension, both Hispanic and non-Hispanic by providing two scores. The scores benefit researchers by providing an understanding of the processes through which Hispanics undergo acculturation. Marin suggests that the BAS scale should include the three subscales and 24 questions in random order.

**The Block Fat-Sugar-Fruit-Vegetable Screener**

The BFSFVS, developed by the Block Dietary Data Systems, is based on the Block 2005 FFQ 110-item questionnaire and is designed to generate point estimates for saturated fat, trans fat, total sugar, added sugar, fruits, and vegetables. The full-length dietary questionnaire, Block 2005 FFQ, was developed by Dr. Gladys Block at the National Cancer Institute (NCI) to utilize in research in the role of diet in health and disease. The Block 2005 FFQ takes 30 to 40 minutes to complete by either self-report or interviewer administration. The Block “Alive” Screener, otherwise known as the Block Fat-Sugar-Fruit-Vegetable Screener, was developed for pre- and post-intervention evaluation of a diet in the  CDC-funded Alive Program (Appendix F). The screener was designed to provide an inexpensive and effective behavior-change intervention. The goals were healthy lifestyle choices, specifically, physical activity and dietary intake of fat, carbohydrates, fruits, and vegetables. The program was delivered entirely via electronic mail over a 12-week period. Participants completed a baseline questionnaire that included a dietary assessment tool, which became the Block "Alive" Screener/(BFSFVS). At completion of the 12-week program, participants repeated the same food questionnaire.

I used the Screener (BFSFVS) in this study as the food questionnaire, which consists of 55 questions and takes approximately 10 to 20 minutes to complete. A series of "adjustment" questions inquiries about the usual intake of low-fat/trans fat-free or low-carbohydrate/low-sugar versions of various foods. An analysis produces estimates of saturated fat, trans fat, total sugars, "added sugars," fruit and fruit juice, vegetable intake, glycemic load, and glycemic index. The participants read and recorded their response to the frequency, quantity of food intake, and the portion size for 32 food items listed on the questionnaire. The BFSFVS provided a simple score of the fruit, vegetable, fat, and sugar intake.

The simple scoring system/cutoff points were created for simple fruit and vegetable and fat scores. For fruits and vegetables, the simple scoring system is as follows: ≥ ~ 5 per day, Excellent; 16-17 ~ 4 per day, Good; 13-15 ~ 3 per day, Fair; < 13 ~ 2 per day, Poor. The simple scoring system is a continuous variable ranging from 1 to 28. The reliability correlation is $r = 0.64$ for the fruit and vegetable screener and $r = 0.85$ for the fat screener. The following is the score breakdown for the fat screener: ≤ 18 = Excellent; 19-24 = Good; 25-33 = Fair; > 33=Poor.

Lalonde, Slovinec, Graham, Beaton, Brown, and Block, (2008) assessed the reliability and validity of the BFSFVS compared to the Block 2005 Food Frequency Questionnaire (FFQ) and to 24-hour dietary recalls. The test-retest reliability was evaluated by computing Pearson correlation coefficients from the Screener administered at Time 1 and Time 2, and the results are as follows: saturated fat (grams) = 0.68; trans fat = 0.74; sugar (grams) = 0.65; added sugar (grams) = 0.66; fruit (cups) = 0.67; vegetables (cups) = 0.56; and fruits and vegetables (cups) = 0.65, with a p-value < 0.001. Secondly, the construct validity was evaluated by comparing the average of the 24-hour recalls to the averages of the two Screener administrations; the results are as follow: Deattenuated Pearson correlations ranged from 0.42 for trans fat to 0.92 for total sugar. The mean correlation, after correction for the within-person variation assess by the dietary recalls, was 0.62 for the average of the 24-hour recalls and the two BFSFVS scores. Lastly, the BFSFVS was evaluated for predicted validity by comparing the nutrient values to those of the FFQ at Time 2 and the Screener at Time 1; the results are as follows: the Pearson correlation coefficients ranges from 0.44 for trans fat to 0.58 for saturated fat. The mean correlation was 0.54 (Lalonde et al., 2008). In addition, Yaroch, Resnicow, and Khan (2000) state that the Block is comparable to the correlation of $r$ = 0.87 among white middle class participants for the Kristal Food Habits Questionnaire and the Connor Diet Habit Survey (Wakimoto et al., 2006).

I obtained the BFSFVS questionnaire, paper and pencil scannable surveys in English, and non-scannable surveys in Spanish with permission from NutritionQuest (Appendix K) for a monetary cost. A Spanish version of the BFSFVS is available only online, although it is not available in a scannable version. Because of the population limitations to personal home computer/Internet access, distribution in data collection in the identified venues, lack of validity of participants completing the survey, and additional set-up cost for the Spanish online version, this researcher did not utilize the online version. In an attempt to obtain a greater representation within the sample and also appeal to cultural values such as personalismo, this researcher obtained the Spanish versions and transposed them onto the English scannable version. This researcher distributed English and Spanish versions to the participants and then returned completed forms to NutritionQuest for processing after transposing the Spanish versions to the English version. NutritionQuest provided the researcher a calculation of nutrition estimates in an electronic file, a data set suitable for statistical analysis in SPSS. Depending on the reading level of the participant, it may have taken 15 to 30 minutes for the participants to complete the survey. In order to reduce the threat of attrition, the participants earned a $5.00 gift card to Walmart, and healthy snacks were provided at each of the venues. The entire survey contained a total of 92 items (13 demographic questions, 24 BAS statements, and 55 BFSFVS questions) and took approximately 30 minutes to complete.

## Data Analysis

After I received the completed surveys, I compiled and coded the data in SPSS version 21. A codebook was constructed to describe the location of the variables and the assignments of the codes to the attributes that compose the variables. A codebook serves as a guide for the coding process and is a reference for locating variables and interpreting codes during data analysis (Babbie, 2012). The codebook was used as a reference to enter data into SPSS 21 software. A two-step process was used for data analysis. Exploratory data analysis was used to uncover patterns in descriptive data and confirmatory data analysis was used for the hypothesis testing and to create and test a probability model.

After screening for outliers and missing data, I ran both descriptive and inferential statistical tests such as frequencies, chi-square test of independence, point-biserial correlations, and multiple logistic regression.

**Chi-Square Test**

I used a chi-square test of independence to examine the relationship between two nominal variables (Steinberg, 2008). I was interested in studying the association between gender and obesity, roles as food preparer and obesity, and role as food purchaser and obesity. The Pearson chi-square statistic and its associated *p* value indicated whether or not the relationship between the given set of nominal variables was statistically significant, with the alpha level set at .05 (Steinberg, 2008). The phi coefficient is used to indicate the strength of association, since the nominal variables are dichotomous (Steinberg, 2008). In addition, the strength of relationship between the variables is interpreted as a measure of effect size (Steinberg, 2008). Variables analyzed with few categories as with nominal, ordinal variables, and bivariate data can be presented in tables (Singleton & Straits, 2009). The tables are constructed and known as cross-tabulation, cross-classification or contingency tables (Singleton & Straits, 2009, p. 467). A cross-tabulation requires a table with a row representing the category of one variable (independent variable) and a column representing the other (dependent) variable.

**Point-Biserial Correlation**

The point-biserial correlation is the correlation between a dichotomous variable and a non-dichotomous/continuous variable (Kornbrot, 2005). Dichotomous variables are also known as binary variables, which are represented by two values. Dichotomous variables are often coded as 0 or 1. Gender, role as food purchaser, role as meal planner/preparer and obesity are examples of a dichotomous variable. Assigning 0 to non-food purchaser or 1 to food purchaser does not imply that either variable is of greater quantity. Non-dichotomous variables imply that one variable is greater or lesser in quantity that the other. Continuous variables are examples of non-dichotomous variables. This research study's dichotomous variables are: gender, role as food purchaser, role as meal planner/preparer, and obesity. This research study's continuous variables are acculturation and dietary intake of saturated fats, sugar, fruits, and vegetables.

**Prescreening Data Analysis**

I used univariate analyses to assess the normality and linearity assumptions for a Pearson correlation analysis. The distribution of scores for the continuous variables should be close to normal (Steinberg, 2008). Exploratory data analysis provided descriptive statistics, which allowed the researcher to examine skewedness, kurtosis, variability, and central tendency (Munro, 2005), as well as histograms to observe the shape of distributions. A scatterplot matrix was created, which determined if the continuous variables formed a linear relationship (Steinberg, 2008). In addition, exploratory data analysis provided exact areas with problems, such as missing values and outliers.

Satisfying assumptions of normality, linearity, or homoscedasticity are not required for binary logistic regression, therefore I applied multivariate analyses to test other assumptions regarding multivariate outliers and multicollinearity (Mertler & Vannatta, 2013). A preliminary multiple linear regression analysis was conducted to calculate the Mahalanobis distance and to assess for multicollinearity between the continuous variables. The regression coefficient table displayed the tolerance statistics, and variables with values that exceeded 0.1 were not deleted (Mertler & Vannatta, 2013). Exploratory data analysis, using the Mahalanobis distance, allowed the researcher to determine which cases exceeded the chi-square criteria based on the number of continuous variables, when alpha level = .001. Any cases that exceeded the chi-square criteria were eliminated from the data analysis (Mertler & Vannatta, 2013).

**Bivariate Analysis**

The first step, analysis of the relationship between nominal variables (chi-square) and dichotomous and continuous variables (point-biserial), were performed. For the second step in this study, I completed a bivariate correlation analysis of the data to examine the relationships between all of the continuous variables. I used a Pearson correlation matrix to determine the strength, direction, and significance of these variables (Steinberg, 2008). The alpha level was set at .05 and indicated whether or not the null hypothesis should be retained or rejected. The strongest positive and negative correlations were reported, along with the weakest positive and negative correlations among the continuous variables. In addition, the results of the correlation matrix may indicate that two or more of the continuous variables are highly intercorrelated, when $r > .80$, which would violate the assumption of multicollinearity in binary logistic regression analysis. This was confirmed using the tolerance statistics; the variables were less than 0.1, which would result in the elimination at least one of two highly correlated variables before conducting the binary logistic regression as described in the pre-screening data analysis section.

There were three main outputs from SPSS for a standard binary logistic regression: a Model Summary Table, a Classification Table and a Table of Coefficients. A Model Summary Table displayed several indices for the generated steps and the overall model fit (Mertler & Vannatta, 2013). The -2 Log Likelihood indicated how well the model fit the data. This researcher required a small value to ensure a perfect model which had a value of 0 (Mertler & Vannatta, 2013). The Cox & Snell R-squared and Nagelkerke R-squared were estimates of $R^2$ , which indicated the proportion of variability in the dependent variables that may be accounted for by the combination of predictor variables (Mertler & Vannatta, 2013). Secondly, the Classification Table revealed the percentage of cases that were correctly classified as obese and not obese, as well as the overall accuracy of the model (Mertler & Vannatta, 2013). Finally, the Table of Coefficients included all the variables. It provided the regression coefficients (B) for each predictor variable, which was used in logistic regression equation (Mertler & Vannatta, 2013). It displayed the Wald statistic and its associated significant value, which was used to assess the significance of the predictor variables, and the alpha level was set at .05 (Mertler & Vannatta, 2013). It indicated the partial correlation coefficients (R) between each predictor variable and the dependent variable, while maintaining the other predictors variables in the equation (Mertler & Vannatta, 2013). It revealed the Exp(B), which was the calculated odds ratio for each variable. An increase in odds ratio that a person would be classified into category when Exp(B) is greater than one and the predictor variable increase by one, and vice versa when the Exp(B) is less than one would decrease in probability (Mertler & Vannatta, 2013).

**Multivariate Analysis**

This researcher conducted binary logistic regression analysis. It is “binary” because the dependent variable is dichotomous (obese, not obese) and two or more predictor variables are categorical/continuous (Katz, 2013; Mertler & Vannatta, 20013). The outcome variable in this study, obesity, was coded as obese (BMI > 30) =1 and not obese (BMI < 30) = 0. Although the discriminant function analysis may be used when the outcome variable has two values, logistic regression requires fewer assumptions, and the maximum likelihood method is used to describe the probability of an event occurring over probability of nonoccurrence (Munro, 2005, p. 303). I completed a multiple logistic regression analysis to determine if there was a statistically significant relationship between the independent variables and obesity, the outcome variable among Hispanic parents/child caregivers in Aurora, Illinois.

**variable selection techniques for multiple logistic regression analysis.** This researcher describes in this section the method which was conducted to determine which independent variables are included in the multivariate model. One purpose of my study was to conduct correlation analyses, because “variables must be related in order to be predictive (Babbie, 2012). First, I used the chi-square test of independence to simply examine the relationships between the nominal variables and to determine their strength and significance. However, the chi-square analysis will not provide which levels of the nominal predictor variables have a significant relationship with the dependent variable.

Consequently, a series of point-biserial correlations were performed to examine the relationship between numeric predictor variables and obesity. I then conducted a multiple logistic regression to determine the fit of the all variables. The importance of each variable was verified using the Wald statistic, and the coefficient for each variable presented in the multiple logistic regression model.

## Protection of the Rights of Study Participants

Institutional Review Board (IRB) approval from Walden University was obtained prior to the study being implemented, and their policies/procedures for protecting human research subjects and ethical standards were strictly adhered to. The researcher also instituted several measures to ensure that the rights of study participants were protected and/or to minimize privacy/confidentiality breaches. First, as previously indicated, the survey was anonymous in nature. The survey did not require participants' names on the survey. Instead, each survey included a unique numerical identifier, which were preprinted on the surveys. Further, a separate consent did not need to be obtained. Completion of the survey implied informed consent, and this was visibly printed on the consent with the written statement (e.g., "Completion of this survey signifies your consent to participate in this research study."). Lock boxes were located at all data collection sites, and participants completed the paper-based survey, sealed their surveys in a white envelope, and placed them in the lock boxes once completed. The researcher did not sit or was near the lock box so as to reduce the "researcher effect." After the data collection was completed and the data analysis was finished, the researcher scanned all available data to several password-protected PDF files, which will be kept in the researcher's computer and flash drive for 5 years. The paper based surveys will also be kept for five years in a locked file cabinet in the researcher's home and then will be shredded.

## Research Dissemination Plan

Participants are able to access the study results in multiple ways. First, by calling or emailing the researcher as instructed on the flier and consent attached to the survey. Second, the researcher provided copies of the results (e.g., an abstract) at community events. Third, the researcher provided the results to the partnering organizations' contacts (e.g., community leaders and leaders from Latina Talk and Tea, etc.) to distribute to patrons. Fourth, upon request, the researcher will present the findings of the study to participants, Hispanic community organization, Latina Talk and Tea and stakeholders: Kane County community leaders and the Healthy Living Coalition in person in efforts to support the Kane County: Quality of Kane Campaign.

## Summary

The chapter outlined the research design, sampling procedures, data collection procedures, data analysis methods, instrumentation, and ethical considerations for working with human participants. Venue-based and volunteer sampling methods were used to recruit a sample of 229 Hispanic parents/child caregivers in Aurora, Illinois. The instrumentation has proven reliability and validity and was used to assess the socioecological and sociodemographic factors that are associated with and/or predictive of obesity among Hispanic parents/caregivers. Correlational analyses determined whether there are significant positive or negative associations between the independent variables and obesity. All variables, regardless of the significance or strength of their correlations with obesity were included in the multiple logistic regression analysis to determine the "fit" of the model to predict obesity among Hispanic parents/caregivers.

# Chapter 4: Results

## Introduction

In this study, I used a cross-sectional research design to determine whether socioecological and sociodemographic factors were associated with obesity among Hispanic parents/child caregivers (18 years of age and older) who reside in Aurora, Illinois. The socioecological factors included: acculturation, dietary intake of saturated fats, dietary intake of sugar, dietary intake of fruits, and dietary intake of vegetables. Sociodemographic factors included: gender, role as food purchaser, role as food planner/preparer, socioeconomic status, and obesity. This study was guided by three research questions and 10 hypotheses. In this chapter, I provided an in-depth discussion of the participant's response rate for surveys, demographics of the sample, descriptive statistics, testing assumptions, statistical analyses used to address each hypothesis, and a presentation of the results. Point-biserial correlations, chi-square, and multiple logistic regression were used to test the hypotheses of the present study.

## Participants Response Rate for Surveys

A total of 229 surveys were administered to participants at one data collection site. Data were collected at the Hispanic community organization, Latina Talk and Tea events/meetings, at the Prisco Community Center located in Aurora, Illinois, from December 17, 2014, until February 28, 2015. Out of the 229 surveys collected, 61 (21%) were unusable. Forty-three participants completed the surveys but did not meet eligibility (e.g., did not identify as a parent/childcare), two were not Aurora residents, and 15 respondents failed to complete to the demographic, BAS, and/or BLOCK surveys. One participant, who did meet the study criteria, was inadvertently omitted during the scoring process because the participant's BLOCK scores were not calculated. In addition, three cases were excluded from the data analyses due to assumption violations, which are discussed later in this section. These 64 surveys were excluded from the sample and the statistical analyses. The final sample size totaled 165 participants and moderate statistical power was achieved with this sample.

## Demographics of the Sample

### Gender

More females $n = 117$ (69.6%) participated in the study than males $n = 51$ (30.4%).

### Residence and ZIP Code of Respondent

All of the participants ($N = 168$) resided in Aurora, Illinois, with the majority of the participants residing in ZIP codes 60505 and 60506, $n = 135$ (80.4%), geographically, central Aurora for 10 years or more $n = 112$ (66.7%). Thirty-three participants (approximately 19.7%) resided in other ZIP codes, 60502, 60503, 60504, 60507, 60598, 60599, or other, geographically, northwest, east, and southeast Aurora. Approximately, thirty-one (18.5%) participants resided in Aurora, Illinois, for five to 10 years; 15 (8.9%) participants resided in Aurora, Illinois, for one to five years; seven (4.2%) participants resided in Aurora, Illinois, for six months to one year; and three (1.8%) participants resided in Aurora, Illinois, for less than six months.

### Ethnicity

All of the participants ($N = 168$) identified as Hispanic.

**Respondent a Parent/Child Caregiver**

All of participants ($N$ = 168) have members in their family who are children (less than 18 years of age) whom reside in their household, which defined them as a parent/child caregiver.

**Food Purchaser**

The majority of participants, $n$ = 138 (82.1%), reported purchasing the food for the family members in their household.

**Food Planner and Preparer**

The majority of the participants, $n$ = 126 (75.0%), reported planning and preparing for the family members in their household.

**Birth Location of Respondent**

The majority of the participants reported birth location as Mexico $n$ = 107 (63.7%). Approximately 29% ($n$ = 49; 29.2%) reported birth location as United States. Six participants (3.6%) reported birth location as Central American. Three participants (1.8%) reported birth location as South America and other, which equaled a total of six participants (3.6%).

**Age**

The mean age of the participants was 37 years of age. The youngest participant was 18 years of age and the oldest participant was 65 years of age.

**Marital Status**

The majority of participants reported their marital status as married ($n$ = 111, 66.1%). Thirty-eight participants (22.6%), twelve participants (6.0%), five participants

(3.0%), and two participants (1.2%) respectively reported their marital status as single, living with partner/significant other, separated, or divorced.

**Highest Level of Education**

The majority of participants reported having attained a high school diploma, *n* = 41 (24.4%). Approximately 22% (*n* = 38; 22.6%) had elementary school or some college; some college, *n* = 35 (20.8%); and some high school, *n* = 24 (14.3%). Twelve (7.1%) participants reported attaining an associate's degree and twelve (7.1%) participants reported attaining a bachelor's degree. Five (3.0%) participants reported attaining a graduate degree, and one (0.6%) participant attained a terminal degree. Consequently, the sample appeared to be sufficiently educated.

**Income (Socioeconomic Status)**

The majority of participants, *n* = 39 (23.2%), reported an income of $21,000–$30,999. Thirty-seven (22.0%) participants reported an income below $20,000 and 30 participants (17.9%), reported an income of $31,000–$40,999. Twenty-seven (16.1%) participants reported an income of $51,000–$75,999. Eighteen (10.7%) participants reported an income of $76,000–$100.000 and 15 (8.9%) participants reported an income of $41,000–$50,999. Only two (1.2%) participants reported an income of over $100,000.

**Body Mass Index**

Table 3 illustrates the participants' reported obesity (*n* = 47, 28.5%), and no obesity (*n* = 118, 71.5%). The majority of participants (*n* = 69, 41.4%) reported BMI of 25.0–29.9, overweight status. Forty-nine (29.4%) participants reported BMI above 30.0, obese weight status. Forty-five (27%) participants reported BMI of 18.5–24.9, normal weight status. Only five (3.0%) participants reported BMI below 18.5, underweight status. Table 4 illustrates the descriptive statistics and the demographics profile of the sample population.

Table 3

*Distribution of Obesity Classifications*

| | | Frequency | % | Valid % | Cumulative % |
|---|---|---|---|---|---|
| Valid | Yes | 47 | 28.5 | 28.5 | 28.5 |
| | No | 118 | 71.5 | 71.5 | 100.0 |
| | Total | 165 | 100.0 | 100.0 | |

Table 4

*Demographic Characteristics of the Sample (N = 168)*

| | | Frequency | % | Mean | Minimum | Maximum |
|---|---|---|---|---|---|---|
| Gender of respondent | Male | 51 | 30.4 | | | |
| | Female | 117 | 69.6 | | | |
| Residence of respondent | Live in Aurora, Illinois | 168 | 100.0 | | | |
| | Does not live in Aurora, Illinois | 0 | 0 | | | |
| ZIP code | 60502 | 3 | 1.8 | | | |
| | 60503 | 3 | 1.8 | | | |
| | 60504 | 12 | 7.1 | | | |
| | 60505 | 87 | 51.8 | | | |
| | 60506 | 48 | 28.6 | | | |
| | 60507 | 2 | 1.2 | | | |
| | 60598 | 2 | 1.2 | | | |
| | 60599 | 4 | 2.4 | | | |
| | other | 7 | 4.2 | | | |
| Ethnicity | Hispanic | 168 | 100 | | | |
| Respondent Parent/child caregiver | Yes | 168 | 100 | | | |
| | No | 0 | 0 | | | |
| Respondent Food purchaser | Yes | 138 | 82.1 | | | |
| | No | 30 | 17.9 | | | |
| Respondent Food planner/preparer | Yes | 126 | 75.0 | | | |
| | No | 42 | 25.0 | | | |
| Respondent Birth location | Mexico | 107 | 63.7 | | | |
| | Central America | 6 | 3.6 | | | |
| | South America | 3 | 1.8 | | | |
| | United States | 49 | 29.2 | | | |
| | Other | 3 | 1.8 | | | |
| Length of time living in Aurora, Illinois | Less than 6 months | 3 | 1.8 | | | |
| | 6 months to 1 year | 7 | 4.2 | | | |
| | 1-5 years | 15 | 8.9 | | | |
| | 5-10 years | 31 | 18.5 | | | |
| | Over 10 years | 112 | 66.7 | | | |
| Age | | | | 37 | 18 | 65 |

(*table continues*)

| | | Frequency | % | Mean | Minimum | Maximum |
|---|---|---|---|---|---|---|
| Marital status | Single | 38 | 22.6 | | | |
| | Married | 111 | 66.1 | | | |
| | Living with partner (LWP) | 8 | 4.8 | | | |
| | Separated | 5 | 3.0 | | | |
| | Divorced | 2 | 1.2 | | | |
| | LWP/significant other | 4 | 2.4 | | | |
| | other | 0 | 0 | | | |
| Education | Elementary school | 38 | 22.6 | | | |
| | Some high school | 24 | 14.3 | | | |
| | High school diploma | 41 | 24.4 | | | |
| | Some college | 35 | 20.8 | | | |
| | Associate degree | 12 | 7.1 | | | |
| | Bachelor’s degree | 12 | 7.1 | | | |
| | Graduate degree | 5 | 3.0 | | | |
| | Terminal degree | 1 | 0.6 | | | |
| Income | Less than $20,000 | 37 | 22.0 | | | |
| | $21,000–30,999 | 39 | 23.2 | | | |
| | $31,000–40,999 | 30 | 17.9 | | | |
| | $41,000–50,999 | 15 | 8.9 | | | |
| | $51,000–75,999 | 27 | 16.1 | | | |
| | $76,000–100,000 | 18 | 10.7 | | | |
| | More than $100,000 | 2 | 1.2 | | | |
| Body mass index | below 18.5 = underweight status | 5 | 3.0 | | | |
| | 18.5–24.9 = normal weight status | 45 | 27 | | | |
| | 25.0–29.9 = overweight status | 69 | 41.4 | | | |
| | Above 30.0 = obese weight status | 49 | 29.4 | | | |

## Summary of Instruments

This study utilized three quantitative instruments. A demographics questionnaire was distributed to capture data on ethnicity, residence, age, gender, education, socioeconomic status, marital status, food purchaser, and food planner/preparer weight and height (Appendix D). The formula I used to calculate BMI was by dividing weight in pounds (lbs) by height in inches (in) squared and multiplied by a conversion factor of 703 (CDC, 2015a). BMI is a classification of weight status: 30.0 and above equals obese weight status (CDC, 2015a). Participants read and recorded a self-report for height and weight. The researcher calculated the BMI. The participants were classified as obese yes or no (Appendix D). The BAS for Hispanics was used to measure acculturation (Appendix E). The Block Fat-Sugar-Fruit-Vegetable-Glycemic Load Screener (BFSFVS) was used to assess participants' intake of fruit, vegetable, fat and sugar (Appendix F).

## Data Analysis

### Exploratory Data Analysis

**initial data screening.** After collecting the required number of surveys, I examined them for completeness and/or to determine if the participants met eligibility requirements. The surveys that were incomplete and the ones in which participants failed to meet eligibility requirements were not used in the data analyses. Initially, a total of 61 surveys were excluded from the analyses. However, a missing value analysis was performed to pre-assess the data for missing and extreme values. As shown in Table 5, no cases were missing data, but there were several extreme scores for the BLOCK intake and BAS (Hispanic) variables. Outliers were identified by calculating Mahalanobis distance. Point-biserial correlations, chi square coefficients and multiple logistic regression were used to test the hypotheses. SPSS, version 21, was used to run the statistical analyses at an alpha level of .05. The results of the statistical analyses are described below.

Table 5

*Missing Values Analysis*

| | *N* | Mean | Standard Deviation | Missing | | No. of extreme scores | |
|---|---|---|---|---|---|---|---|
| | | | | Count | % | Low | High |
| Saturated fat intake | 168 | 16.29821 | 10.173352 | 0 | .0 | 0 | 3 |
| Sugar intake | 168 | 69.13869 | 50.964888 | 0 | .0 | 0 | 9 |
| Fruit intake | 168 | 1.24597 | .858240 | 0 | .0 | 0 | 3 |
| Vegetable intake | 168 | 1.03620 | .776251 | 0 | .0 | 0 | 5 |
| BAS Hispanic domain | 168 | 3.5087 | .64429 | 0 | .0 | 9 | 0 |
| BAS Non-Hispanic domain | 168 | 2.5738 | .97568 | 0 | .0 | 0 | 0 |
| Gender | 168 | | | 0 | .0 | | |
| Food purchaser | 168 | | | 0 | .0 | | |
| Food planner/preparer | 168 | | | 0 | .0 | | |
| Total annual income | 168 | | | 0 | .0 | | |
| Obesity | 168 | | | 0 | .0 | | |

Note: a. Number of cases outside the range (Q1 - 1.5*IQR, Q3 + 1.5*IQR).

Testing assumptions. The univariate statistics, shown in Table 5 reveal that the measures of central tendency were fairly close in range for all the variables. The skewness and kurtosis values only slightly exceeded ±2.00. This suggested that the distributions were close to normal. Hence the data were not transformed. In addition, the results of the scatterplot matrix showed the relationships between the variables were linear. Hence, the assumption was not violated (Appendix L).

**descriptive statistics**. Results from the BAS for Hispanics showed that the participants' acculturation and demonstrated biculturalism with high scores on the BAS Hispanic domain (M = 3.52, SD = 0.620) and BAS non-Hispanic domains (M = 2.58, SD = 0.977), which was above the 2.5 cutoff score (Table 6). The BFSFVS showed participants' fruit intake score (M = 1.24, SD = 0.853) and participants' vegetable intake score (M = 1.03, SD = 0.773), which were poor. The participants' reported saturated fats intake score (M = 15.92, SD = 8.807). The participants' reported sugar intake score was (M = 65.58, SD = 36.83) (see Table 7).

Table 6

*Acculturation and Demonstrated Biculturalism*

| | N | Mean | Minimum | Maximum | Std. Deviation |
|---|---|---|---|---|---|
| BAS Hispanic score | 165 | 3.5200 | 1 | 4 | .642057 |
| BAS Non-Hispanic score | 165 | 2.5756 | 1 | 4 | .977332 |
| Valid *N* (listwise) | 165 | | | | |

Table 7

*Descriptive Statistics of Saturated Fat Intake, Sugar Intake, Fruit Intake, and Vegetable Intake*

| | | Saturated fat intake | Sugar intake | Fruit intake | Vegetable intake |
|---|---|---|---|---|---|
| *N* | Valid | 165 | 165 | 165 | 165 |
| | Missing | 0 | 0 | 0 | 0 |
| Mean | | 15.91521 | 65.57764 | 1.24135 | 1.03419 |
| Median | | 14.26000 | 58.19000 | 1.09000 | .85700 |
| Mode | | 6.540[a] | 43.060[a] | 1.580 | .140 |
| Std. Deviation | | 8.087231 | 36.828300 | .852940 | .773100 |
| Variance | | 65.403 | 1356.324 | .728 | .598 |
| Skewness | | .901 | 1.304 | .851 | 1.247 |
| Std. Error of Skewness | | .189 | .189 | .189 | .189 |
| Kurtosis | | .607 | 2.135 | .434 | 1.489 |
| Std. Error of Kurtosis | | .376 | .376 | .376 | .376 |
| Range | | 41.670 | 211.850 | 4.000 | 3.760 |
| Minimum | | 2.690 | 11.520 | .000 | .000 |
| Maximum | | 44.360 | 223.370 | 4.000 | 3.760 |

*Note:* a. Multiple modes exist. The smallest value is shown.

**Chi-Square Tests of Independence**

Hypothesis 1.

Ho1: The is no relationship between gender and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

Ha1: The is a relationship between gender and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

In order to test this hypothesis, the chi-square test of independence measuring the relationship between gender and obesity was computed (see Table 8). As shown in Table 8, nearly twice as many females ($n$ = 30) were obese as compared to males ($n$ = 17). The relationship between gender and obesity was not statistically significant, $X^2$ (1) = .852, $p$

= .36, but the effect size was very strong (Tables 9 and 10). Thus, the null hypothesis of no relationship between gender and obesity was retained, since the Sig. value was above .05.

Table 8

*Gender and Obesity Contingency*

| | | | Obesity | | Total |
|---|---|---|---|---|---|
| | | | yes | no | |
| Gender | Male | Count | 17 | 34 | 51 |
| | | % of total | 10.3% | 20.6% | 30.9% |
| | Female | Count | 30 | 84 | 114 |
| | | % of total | 18.2% | 50.9% | 69.1% |
| Total | | Count | 47 | 118 | 165 |
| | | % of total | 28.5% | 71.5% | 100.0% |

Table 9

*Gender and Obesity Chi-Square Tests*

| | Value | *df* | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---|---|---|---|---|---|
| Pearson Chi-Square | .852[a] | 1 | .356 | | |
| Continuity Correction[b] | .542 | 1 | .462 | | |
| Likelihood Ratio | .838 | 1 | .360 | | |
| Fisher's Exact Test | | | | .358 | .229 |
| Linear-by-Linear Association | .847 | 1 | .357 | | |
| N of Valid Cases | 165 | | | | |

*Note:* a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 14.53.
b. Computed only for a 2x2 table

Table 10

*Gender and Obesity Symmetric Measures*

| | Value | *df* | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---|---|---|---|---|---|
| Pearson Chi-Square | .041[a] | 1 | .839 | | |
| Continuity Correction[b] | .000 | 1 | 1.000 | | |
| Likelihood Ratio | .041 | 1 | .840 | | |
| Fisher's Exact Test | | | | .826 | .500 |
| Linear-by-Linear Association | .041 | 1 | .839 | | |
| N of Valid Cases | 165 | | | | |

*Note:* a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.55.
b. Computed only for a 2x2 table

Hypothesis 2.

Ho2: There is no relationship between the food purchaser or who are not the food purchaser and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

Ha2: The food purchaser is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

In order to test this hypothesis, the chi-square test of independence measuring the relationship between food purchaser and obesity was computed (see Table 11). There were 135 food purchasers among the sample, and 38 of the participants were obese. In contrast, nine of the 30 non-food purchasers were obese (Table 11). The relationship between these food purchasers and obesity variables was not statistically significant, $X^2$ (1) = .041, $p$ = .84, and the effect size was small (Tables 12 and 13). Thus, the null hypothesis of no relationship between the food purchaser and obesity was retained.

Table 11

*Food Purchaser and Obesity Contingency*

| | | | Obesity | | Total |
|---|---|---|---|---|---|
| | | | yes | no | |
| Food purchaser | yes | Count | 38 | 97 | 135 |
| | | % of Total | 23.0% | 58.8% | 81.8% |
| | no | Count | 9 | 21 | 30 |
| | | % of Total | 5.5% | 12.7% | 18.2% |
| Total | | Count | 47 | 118 | 165 |
| | | % of Total | 28.5% | 71.5% | 100.0% |

Table 12

*Food Purchaser and Obesity Chi-Square Tests*

| | Value | *df* | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
|---|---|---|---|---|---|
| Pearson Chi-Square | .041[a] | 1 | .839 | | |
| Continuity Correction[b] | .000 | 1 | 1.000 | | |
| Likelihood Ratio | .041 | 1 | .840 | | |
| Fisher's Exact Test | | | | .826 | .500 |
| Linear-by-Linear Association | .041 | 1 | .839 | | |
| N of Valid Cases | 165 | | | | |

*Note:* a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.55.
b. Computed only for a 2x2 table

Table 13

*Food Purchaser and Obesity Symmetric Measures*

| | | Value | Approx. Sig. |
|---|---|---|---|
| Nominal by Nominal | Phi | -.016 | .839 |
| | Cramer's V | .016 | .839 |
| *N* of Valid Cases | | 165 | |

Hypothesis 3.

Ho3: There is no relationship between the food planner/preparer or who are not the food planner/preparer and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

Ha3: The food planner/preparer is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

In order to test this hypothesis, the chi-square test of independence measuring the relationship between food preparer and obesity was computed (see Table 14). Of the 123 participants who were food planner/preparers, 36 were obese and eleven of the 42 non-food planner/preparers were obese (Table 14). The relation between food planner/preparer and obesity was not statistically significant, $X^2$ (1) = .146, $p$ =.70, and the effect size was small (Tables 15 and 16). Thus, the null hypothesis of no relationship between the food planner/preparer or who are not the food planner/preparer and obesity was retained.

Table 14

*Food Planner/Preparer and Obesity Contingency*

| | | | Obesity | | Total |
|---|---|---|---|---|---|
| | | | yes | no | |
| Food planner/preparer | yes | Count | 36 | 87 | 123 |
| | | % of Total | 21.8% | 52.7% | 74.5% |
| | no | Count | 11 | 31 | 42 |
| | | % of Total | 6.7% | 18.8% | 25.5% |
| Total | | Count | 47 | 118 | 165 |
| | | % of Total | 28.5% | 71.5% | 100.0% |

Table 15

*Food Planner/Preparer and Obesity Chi-Square Tests*

| | Value | *df* | Asymp. Sig. (2-sided) | Exact Sig. (2 sided) | Exact Sig. (1-sided) |
|---|---|---|---|---|---|
| Pearson Chi-Square | .146[a] | 1 | .703 | | |
| Continuity Correction[b] | .034 | 1 | .854 | | |
| Likelihood Ratio | .147 | 1 | .701 | | |
| Fisher's Exact Test | | | | .843 | .433 |
| Linear-by-Linear Association | .145 | 1 | .704 | | |
| N of Valid Cases | 165 | | | | |

*Note:* a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.96.
b. Computed only for a 2x2 table

Table 16

*Food Planner/Preparer and Obesity Symmetric Measures*

| | | Value | Approx. Sig. |
|---|---|---|---|
| Nominal by Nominal | Phi | .030 | .703 |
| | Cramer's V | .030 | .703 |
| *N* of Valid Cases | | 165 | |

**Point-Biserial Correlations**

Hypothesis 4.

Ho4: There is no relationship between acculturation and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

Ha4: Acculturation is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

In order to test this hypothesis, the point-biserial correlation between acculturation and obesity was computed (see Table 17). A weak, negative correlation existed between BAS Hispanic Domain scores and obesity. This relationship was not statistically significant, $r_{pb} = -.068$, $p = .19$ (Table 17). Thus, the null hypothesis of no association between acculturation and obesity was retained. Lower BAS Hispanic Domain scores were associated with non-obese participants.

Table 17

*BAS Hispanic Domain and Obesity Correlations*

| | | BAS Hispanic domain | Obesity |
|---|---|---|---|
| BAS Hispanic domain | Pearson Correlation | 1 | -.068 |
| | Sig. (1-tailed) | | .192 |
| | N | 165 | 165 |
| Obesity | Pearson Correlation | -.068 | 1 |
| | Sig. (1-tailed) | .192 | |
| | N | 165 | 165 |

A weak, positive correlation between BAS non-Hispanic Domain scores and obesity was statistically significant, $r_{pb} = .166$, $p = .02$. Thus, the null hypothesis of no association between acculturation and obesity was rejected (Table 18). These results indicate that higher BAS non-Hispanic Domain scores were associated with non-obese participants.

Table 18

*BAS non-Hispanic Domain and Obesity Correlations*

| | | BAS Non-Hispanic domain | Obesity |
|---|---|---|---|
| BAS Non-Hispanic domain | Pearson Correlation | 1 | .166* |
| | Sig. (1-tailed) | | .017 |
| | N | 165 | 165 |
| Obesity | Pearson Correlation | .166* | 1 |
| | Sig. (1-tailed) | .017 | |
| | N | 165 | 165 |

*Note:* *Correlation is significant at the 0.05 level (1-tailed).

Hypothesis 5.

Ho5: There is no relationship between dietary intake of saturated and trans fats and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

Ha5: Dietary intake of saturated and trans fats is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

In order to test this hypothesis, the point-biserial correlation between saturated fat intake and obesity was computed (see Table 19). A weak, negative relationship existed between saturated fat intake and obesity. However, this relationship was not statistically significant, $r_{pb}$ = -.037, $p$ =.32 (Table 19). Thus, the null hypothesis of no association between saturated fat intake and obesity was retained. Lower saturated fat intakes were associated with non-obese participants.

Table 19

*Saturated Fat Intake and Obesity Correlations*

| | | Saturated fat intake | Obesity |
|---|---|---|---|
| Saturated fat intake | Pearson Correlation | 1 | -.037 |
| | Sig. (1-tailed) | | .316 |
| | *N* | 168 | 168 |
| Obesity | Pearson Correlation | -.037 | 1 |
| | Sig. (1-tailed) | .316 | |
| | *N* | 168 | 168 |

Hypothesis 6.

Ho6: There is no relationship between dietary intake of sugar and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

Ha6: Dietary intake of sugar is positively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

In order to test this hypothesis, the point-biserial correlation between sugar intake and obesity was computed (see Table 20). This relationship was not statistically significant, $r_{pb}$ = -.032, $p$ =.34 (Table 20). Thus, the null hypothesis of no association between sugar intake and obesity was retained. Lower sugar intakes were associated with non-obese participants.

Table 20

*Sugar Intake and Obesity Correlations*

| | | Sugar Intake | Obesity |
|---|---|---|---|
| Sugar intake | Pearson Correlation | 1 | -.032 |
| | Sig. (1-tailed) | | .342 |
| | N | 168 | 168 |
| Obesity | Pearson Correlation | -.032 | 1 |
| | Sig. (1-tailed) | .342 | |
| | N | 168 | 168 |

Hypothesis 7.

Ho7: There is no relationship between dietary intake of fruits and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

Ha7: Dietary intake of fruits is negatively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

In order to test this hypothesis, the point-biserial correlation between fruit intake and obesity was computed (see Table 21). There was no relationship found between fruit intake and obesity. This correlation was not statistically significant, $r_{pb} = .067$, $p = .22$ (Table 21). Thus, the null hypothesis of no association between fruits intake and obesity was retained. These results indicate that higher intakes of fruits were associated with non-obese participants.

Table 21

*Fruit Intake and Obesity Correlations*

| | | Fruit intake | Obesity |
|---|---|---|---|
| Fruit intake | Pearson Correlation | 1 | .061 |
| | Sig. (1-tailed) | | .218 |
| | N | 165 | 165 |
| Obesity | Pearson Correlation | .061 | 1 |
| | Sig. (1-tailed) | .218 | |
| | N | 165 | 165 |

Hypothesis 8.

Ho8: There is no relationship between dietary intake of vegetables and obesity among Hispanic parent/child caregivers in Aurora, Illinois.

Ha8: Dietary intake of vegetables is negatively correlated with obesity among Hispanic parent/child caregivers in Aurora, Illinois.

In order to test this hypothesis, the point-biserial correlation between vegetable intake and obesity was computed (see Table 22). There was no relationship found between vegetable intake and obesity. This correlation was not statistically significant, $r_{pb} = -.038$, $p = .31$ (Table 22). Thus, the null hypothesis of no association between vegetable intake and obesity was retained. These results indicate that lower intakes of vegetable were associated with non-obese participants.

Table 22

*Vegetable Intake and Obesity Correlations*

| | | Vegetable Intake | Obesity |
|---|---|---|---|
| Vegetable intake | Pearson Correlation | 1 | -.038 |
| | Sig. (1-tailed) | | .312 |
| | N | 165 | 165 |
| Obesity | Pearson Correlation | -.038 | 1 |
| | Sig. (1-tailed) | .312 | |
| | N | 165 | 165 |

**Bivariate Correlations**

Hypothesis 9.

Ho9: There is no relationship between acculturation, intake of saturated fats, intake of fruits, intake of sugars, and intake of vegetables.

Ha9: There is a significant relationship between acculturation, intake of saturated fats, intake of fruits, intake of sugars, and intake of vegetables.

**bivariate correlation.** In order to test this hypothesis, bivariate correlation between acculturation, intake of fats, sugars and vegetables was computed. In Table 23, the results showed significant positive correlations existed between saturated fat intake and sugar intake ($r = .644$, $p < .001$), and between fruit intake and vegetable intake ($r = .347$, $p < .001$). In contrast, significant negative correlations were found between BAS Hispanic Domain and BAS non-Hispanic Domain ($r = -.500$, $p < .001$). Therefore, the null hypothesis that there is no association between acculturation and dietary intake is rejected.

Table 23

*Bivariate Correlation Analysis*

| | | BAS Hispanic | BAS Non-Hispanic | Saturated fat intake | Sugar intake | Fruit intake | Vegetable intake |
|---|---|---|---|---|---|---|---|
| BAS Hispanic | Pearson Correlation | 1 | -.500** | .036 | .105 | .061 | -.030 |
| | Sig. (2-tailed) | | .000 | .647 | .177 | .430 | .695 |
| | *N* | 168 | 168 | 168 | 168 | 168 | 168 |
| BAS Non-Hispanic | Pearson Correlation | -.500** | 1 | -.034 | .004 | -.015 | .000 |
| | Sig. (2-tailed) | .000 | | .661 | .957 | .852 | .998 |
| | *N* | 168 | 168 | 168 | 168 | 168 | 168 |
| Saturated fat intake | Pearson Correlation | .036 | -.034 | 1 | .644** | -.003 | .137 |
| | Sig. (2-tailed) | .647 | .661 | | .000 | .966 | .077 |
| | *N* | 168 | 168 | 168 | 168 | 168 | 168 |
| Sugar intake | Pearson Correlation | .105 | .004 | .644** | 1 | .258** | .120 |
| | Sig. (2-tailed) | .177 | .957 | .000 | | .001 | .120 |
| | *N* | 168 | 168 | 168 | 168 | 168 | 168 |
| Fruit intake | Pearson Correlation | .061 | -.015 | -.003 | .258** | 1 | .347** |
| | Sig. (2-tailed) | .430 | .852 | .966 | .001 | | .000 |
| | *N* | 168 | 168 | 168 | 168 | 168 | 168 |
| Vegetable intake | Pearson Correlation | -.030 | .000 | .137 | .120 | .347** | 1 |
| | Sig. (2-tailed) | .695 | .998 | .077 | .120 | .000 | |
| | *N* | 168 | 168 | 168 | 168 | 168 | 168 |

*Note:* **. Correlation is significant at the 0.01 level (2-tailed).

**Binary Logistic Regression**

**Testing assumptions**. As previously mentioned, the results of the missing values analysis revealed there were 29 cases with extremely high (n = 20) and low (n = 9) values for several variables. An initial analysis of the univariate statistics indicated that the variables saturated fat intake and sugar intake greatly deviated from a normal distribution, as shown below in Table 24.

Table 24

*Descriptive Statistics With Nonnormal Distributions*

| | | Saturated fat intake | Sugar intake | Fruit intake | Vegetable intake | BAS Hispanic | BAS Non-Hispanic |
|---|---|---|---|---|---|---|---|
| *N* | Valid | 168 | 168 | 168 | 168 | 168 | 168 |
| | Missing | 0 | 0 | 0 | 0 | 0 | 0 |
| Mean | | 16.29821 | 69.13869 | 1.24597 | 1.03620 | 3.5087 | 2.5738 |
| Median | | 14.24500 | 58.49000 | 1.08500 | .85850 | 3.7500 | 2.5000 |
| Mode | | 6.540[a] | 43.060[a] | 1.580 | .140 | 4.00 | 4.00 |
| Std. Deviation | | 10.173352 | 50.964888 | .858240 | .776251 | .64429 | .97568 |
| Variance | | 103.497 | 2597.420 | .737 | .603 | .415 | .952 |
| Skewness | | 3.278 | 3.512 | .852 | 1.218 | -1.714 | .100 |
| Std. Error of Skewness | | .187 | .187 | .187 | .187 | .187 | .187 |
| Kurtosis | | 21.752 | 19.576 | .380 | 1.383 | 2.787 | -1.227 |
| Std. Error of Kurtosis | | .373 | .373 | .373 | .373 | .373 | .373 |
| Minimum | | 2.690 | 11.520 | .000 | .000 | 1.00 | 1.00 |
| Maximum | | 96.030 | 434.630 | 4.000 | 3.760 | 4.00 | 4.00 |

*Note:* a. Multiple modes exist. The smallest value is shown.

The Mahalanobis distance was calculated to further assess the data for multivariate outliers. In Table 25, the outcome showed that three cases exceeded the critical chi-square value of 22.46, when $p = .001$. These participants were excluded from the data analyses ($N = 165$). Further, the tolerance statistics for these continuous variables exceeded 0.1, hence multicollinearity was not an issue (Table 26).

Table 25

*Mahalanobis Extreme Values*

| | | | Case number | Value |
|---|---|---|---|---|
| Mahalanobis Distance | Highest | 1 | 132 | 73.11352 |
| | | 2 | 84 | 55.67089 |
| | | 3 | 36 | 23.84038 |
| | | 4 | 6 | 22.24563 |
| | | 5 | 7 | 19.85212 |
| | Lowest | 1 | 30 | .73664 |
| | | 2 | 14 | .78511 |
| | | 3 | 24 | .84676 |
| | | 4 | 56 | .85422 |
| | | 5 | 141 | 1.06917 |

Table 26

*Tolerance Statistics*

| Model | Unstandardized Coefficients | | Standardized Coefficients | *t* | Sig. | Collinearity Statistics | |
|---|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | Tolerance | VIF |
| (Constant) | .434 | .317 | | 1.369 | .173 | | |
| Average BAS Hispanic | .003 | .067 | .004 | .039 | .969 | .720 | 1.390 |
| Average BAS Non-Hispanic | .075 | .042 | .162 | 1.779 | .077 | .725 | 1.379 |
| Saturated fat intake | -.001 | .005 | -.012 | -.120 | .904 | .656 | 1.524 |
| Sugar intake | .002 | .001 | .127 | 1.271 | .205 | .605 | 1.653 |
| Fruit intake | .034 | .047 | .064 | .725 | .469 | .776 | 1.289 |
| Vegetable intake | -.053 | .050 | -.091 | -1.065 | .289 | .819 | 1.221 |

*Note:* a. Dependent Variable: Obesity

Hypothesis 10.

Ho10: All of the independent variables: acculturation; gender; dietary intake of saturated and trans fats, sugar, and fruits and vegetables; role as food purchaser; role as meal planner and preparer; and socioeconomic status are not predictors of obesity among Hispanic parent/child caregivers in Aurora, Illinois

Ha10: At least one of the independent variables: acculturation; gender; dietary intake of saturated and trans fats, sugar, and fruits and vegetables; role as food purchaser; role as meal planner and preparer; and socioeconomic status is a predictor of obesity among Hispanic parent/child caregivers in Aurora, Illinois.

**regression results.** In order to test this hypothesis, multiple logistic regression was employed to regress obesity onto acculturation, gender, dietary intake of saturated fats, sugar, fruits and vegetables, role as food purchaser, role as food planner/preparer, and socioeconomic status. The Model fit statistics shown in Table 27 were moderate, indicating a fairly good-fitting model, -2 Log Likelihood = 181.269. However, the model variables accounted for only 13.2% of the explained variance in obesity. In addition, the classification results presented in Table 28 demonstrated that the model correctly classified 74.5% of the participants.

Table 27

*Model Summary Table*

| Step | -2 Log likelihood | Cox & Snell R-Squared | Nagelkerke R-Squared |
|---|---|---|---|
| 1 | 181.269[a] | .092 | .132 |

*Note:* a. Estimation terminated at iteration number 20 because maximum iterations has been reached. Final solution cannot be found.

Table 28

*Classification Table*

| | Observed | | Predicted Obesity yes | no | Percentage correct |
|---|---|---|---|---|---|
| Step 1 | Obesity | yes | 8 | 39 | 17.0 |
| | | no | 3 | 115 | 97.5 |
| | Overall percentage | | | | 74.5 |

*Note:* a. The cut value is .500.

The variables, gender, and BAS non-Hispanic Domain scores significantly contributed to the model. Table 29 provided the odds ratios for the summary of model variables. However, the Wald statistic was only statistically significant for gender, Wald = -.901, $p$ = .05, and BAS non-Hispanic Domain scores, Wald =.552, $p$ = .03. Thus, the null hypothesis that gender was not a predictor of obesity was rejected. The log odds of developing obesity were .406 (2.46 times) lower in males compared to females. Hence, for every one unit increase in BAS non-Hispanic Domain scores, the log odds of being classified as obese increased by 1.737 times.

Table 29

*Regression Coefficients*

| | | B | S.E. | Wald | *df* | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1[a] | Gender (1) | -.901 | .455 | 3.929 | 1 | .047 | .406 |
| | Food purchaser (1) | 1.072 | .787 | 1.855 | 1 | .173 | 2.922 |
| | Food planner/preparer (1) | -.983 | .726 | 1.834 | 1 | .176 | .374 |
| | Total annual income | | | 1.060 | 6 | .983 | |
| | Total annual income (1) | -18.757 | 28254.032 | .000 | 1 | .999 | .000 |
| | Total annual income (2) | -18.874 | 28254.032 | .000 | 1 | .999 | .000 |
| | Total annual income (3) | -18.776 | 28254.032 | .000 | 1 | .999 | .000 |
| | Total annual income (4) | -18.623 | 28254.032 | .000 | 1 | .999 | .000 |
| | Total annual income (5) | -19.272 | 28254.032 | .000 | 1 | .999 | .000 |
| | Total annual income (6) | -18.957 | 28254.032 | .000 | 1 | .999 | .000 |
| | Saturated fat intake | .001 | .029 | .001 | 1 | .970 | 1.001 |
| | Sugar intake | .010 | .008 | 1.672 | 1 | .196 | 1.010 |
| | Fruit intake | .277 | .285 | .945 | 1 | .331 | 1.319 |
| | Vegetable intake | -.375 | .265 | 1.996 | 1 | .158 | .687 |
| | BAS Hispanic domain | .059 | .403 | .022 | 1 | .883 | 1.061 |
| | BAS Non-Hispanic domain | .552 | .249 | 4.934 | 1 | .026 | 1.737 |
| | Constant | 17.761 | 28254.032 | .000 | 1 | .999 | 51680492.014 |

*Note:* a. Variable(s) entered on step 1: Gender, Food Purchaser, Food Planner/Preparer, Total Annual Income, Saturated Fat Intake, Sugar Intake, Fruit Intake, Vegetable Intake, BAS Hispanic Domain, BAS non-Hispanic.

**Summary**

All of the participants ($N$ = 168) self-identified as being Hispanic. Approximately, thirty-one (18.5%) participants resided in Aurora, Illinois, for five to 10 years. All of participants had family members in their household who were less than 18 years of age. More participants, $n$ = 138 (82.1%), reported purchasing the food and $n$ = 126 (75.0%) participants, reported planning and preparing for the family members in their household. Almost all of the participants, $n$ = 107 (63.7%) reported their birth location as Mexico. The majority of the participants were females $n$ = 117 (69.6%). The mean age of the participants was 37 years of age. The majority of participants reported their marital status as married ($n$ = 111, 66.1%), having attained a high school diploma, $n$ = 41 (24.4%) and an income of $21,000–$30,999, $n$ = 39 (23.2%). Participants conveyed their height and weight which was calculated into the BMI, a classification weight status. Participants' reported an obesity weight status $n$ = 47, (28.5%) and no obesity $n$ = 118 (71.%).

The sample results from the BAS for Hispanics showed that the participants' acculturation and demonstrated biculturalism with high scores on the BAS Hispanic domain (M = 3.52, SD = 0.620) and BAS non-Hispanic domains (M = 2.58, SD = 0.977). The BFSFVS showed participants' fruit intake score (M = 1.24, SD = 0.853) and participants' vegetable intake score (M = 1.03, SD = 0.773), which were poor. The participants' reported saturated fats intake score (M = 15.92, SD = 8.807) were poor. The participants' reported sugar intake score was (M = 65.58, SD = 36.83) were poor.

Lastly, 10 hypotheses were tested in the current research study, the majority of hypotheses yielded no statistically significant results. However, the relationship between acculturation (BAS non-Hispanic Domain scores) and obesity was positive and statistically significant (Hypothesis 4). Similarly, significant positive correlations were discovered between fat and sugar intake and between fruits and vegetables (Hypothesis 9). Contrarily, a significant negative correlation was discovered between BAS Hispanic and non-Hispanic Domains (Hypothesis 9). Multiple logistic regression was applied to predict independent variables and obesity. The Model fit statistic was moderate, indicating a good fit model. Further, gender and BAS non-Hispanic Domain scores were significant predictors of obesity where developing obesity was 2.46 times lower in males compared to females and obesity increased 1.737 times with every one unit increase in BAS non-Hispanic Domain scores (Hypothesis 10). An in-depth analysis of these factors as well as the study finding will be discussed in Chapter 5. Chapter 5 will also include a discussion of the study limitations, implications, recommendations for future research, and to initiate positive social change.

# Chapter 5: Discussion, Conclusions, and Recommendations

## Introduction

Obesity disproportionately affects minority populations in the United States. African Americans have the highest age-adjusted rates of obesity (49.5%) compared with Mexican Americans (40.4%), all Hispanic Americans (39.1%), and European Americans (34.3%) (CDC, 2015g). Obesity rates among Hispanic populations in the United States have risen significantly over the last two decades (CDC, 2015g). In Illinois, 28% of adults are obese and 37% of adults are overweight (CDC, 2015a; IAPO, 2015). Aurora, Illinois in Kane County, reports 34.5% are overweight and 29.4% are obese (KCHD, 2011, p. 17). The rising rates of obesity have led to increased morbidity and mortality and shortened projected longevity for children and adolescents who are expected to have a shorter lifespan than their parents or family members from past generations (Berry et al., 2009; Braveman et al., 2010). Obesity is a contributor to cardiovascular disease, hypertension, stroke, cancer, diabetes, and premature death; it causes approximately 3 million deaths worldwide every year (CDC, 2011; WHO, 2015). However, little research has been conducted on the dietary habits of Hispanic families, and existing studies have failed to utilize a socioecological approach to explore the development of obesity among Hispanic populations (Tanofsky-Kraff et al., 2006). This preventable pandemic affects families from all age groups, regions, education levels, and financial and cultural backgrounds.

The purpose of this study was to determine whether socioecological and sociodemographic factors were associated with obesity among Hispanic parents/child caregivers (18 years of age and older) who reside in Aurora, Illinois. The socioecological factors included: acculturation, dietary intake of saturated fats, dietary intake of sugar, dietary intake of fruits, and dietary intake of vegetables. Sociodemographic factors included: gender, role as food purchaser, role as food preparer, socioeconomic status, and obesity. Surveys were collected from 229 participants at one data collection site from a local Hispanic community organization.

Ten hypotheses were developed to address the three research questions that guided the study to explore socioecological and sociodemographic factors associated with obesity among Hispanic parent/child caregivers (18 years of age and older) who reside in Aurora, Illinois. Point-biserial correlations, and chi-square, were used to analyze the relationship between the variables (e.g., acculturation; gender; dietary intake of saturated and trans fats, sugar, and fruits and vegetables; role as food purchaser; role as food planner and preparer; and socioeconomic status) and the outcome variable, obesity among Hispanic parent/child caregivers in Aurora, Illinois. Multiple logistic regression was used to analyze whether the variables (e.g., acculturation; gender; dietary intake of saturated and trans fats, sugar, and fruits and vegetables; role as food purchaser; role as food planner and preparer; and socioeconomic status) were predictive with the outcome variable, obesity among Hispanic parent/child caregivers in Aurora, Illinois.

## Interpretation of the Findings

Ten hypotheses were tested in the current research study, and the majority of hypotheses yielded no statistically significant results. However, the relationship between BAS non-Hispanic Domain scores and obesity was positive and statistically significant.

Similarly, significant correlations were discovered between fats and sugar and between fruits and vegetables and a negative correlation between BAS Hispanic and non-Hispanic Domains. Gender and BAS non-Hispanic Domain scores were significant predictors of obesity where developing obesity was 2.46 times lower in males compared to females and obesity increased 1.737 times with every one unit increase in BAS non-Hispanic Domain scores. Few researchers have examined correlates and predictors of acculturation; gender; dietary intake of saturated and trans fats, sugar, and fruits and vegetables; role as food purchaser; role as meal planner and preparer; and socioeconomic status in the Hispanic among Hispanic parent/child caregivers in Aurora, Illinois. This study is the first study in which a researcher used roles: food purchaser, meal planner, and preparer among Hispanic parent/child caregivers. The results of this study contributed to the existing literature.

**Gender and Obesity**

I used the chi-square tests of independence to measure the relationship between gender and obesity. The results of the study showed that 10.3% of Hispanic men and 18.2% of Hispanic women were obese. I found that there was no significant association between gender and obesity ($p$ = .36). Therefore, the null hypothesis could not be rejected.

These results are contradictory with what I found in the literature. The National Health Interview Survey (NHIS) 2007–2010 states that 33.1% of Hispanic women are obese and 44.6% of Hispanic women are overweight, while 30.7% of Hispanic men are obese and 33.6% of Hispanic men are overweight. Between the measurement periods of

1988–1994 and 2009–2010, the prevalence of obesity increased from 23.9% to 35.6% among Mexican-American men and 35.4% to 44.3% among Mexican-American women (CDC, 2013f). Kane County (2012), reported that the prevalence for Hispanic men who are overweight is 79.9% and who are obese, 35.3%; for Hispanic women, 74.4% are overweight and 40.7% are obese among adults ages 20 years and older (KCHD, 2011). However, this study's participants reported $n$ = 69 (41.4%) an overweight status. This is consistent to the Kane County (2012) report. Consequently, no significant association between gender and obesity may be related to a low number of male participants. Among the male participants, their significant other or female counterpart participated in the study. The male participant may have felt pressure from his female counterpart to participate in the study. This may have led to a misrepresentation of the male participants that reflected in the analysis of gender and obesity. However, in this research study, nearly twice as many females ($n$ = 30) were obese as compared to males ($n$ = 17). The females participants may have under estimated their height and weight which lead to a misrepresentation of an overweight and obese status. Thus by replicating this study, research may assist to identify and confirm important patterns or trends in the Hispanic population that would be beneficial to Aurora Illinois residents, and health professionals at a local and national level.

**Parent/Child Caregiver, Food Purchaser, and Obesity**

I used the chi-square tests of independence to measure the relationship between food purchaser and obesity. I found that there was no significant association between food purchaser and obesity ($p$ = .84). Therefore, the null hypothesis could not be rejected.

These results extend to the existing research. There has been limited to non-existent research conducted on the specific roles of Hispanic parent/child caregiver and food purchaser in relation to obesity. Further, Pearson et al. (2009) indicated that when fruit and vegetable intake was divided by socioeconomic status (SES), 40% of children from lower SES categories had both inadequate fruit and vegetable intakes. Hojjat (2015) found that over the last couple of decades, healthier foods such as fish, fruits, and vegetables have become more expensive compared to high-calorie foods. In addition, Pereira et al. (2005) indicated that, because of low financial resources, families of lower SES need to purchase food more efficiently. Conversely, higher SES individuals may have greater access to health care, healthy foods, and physical activity opportunities that may help offset obesity risks (Berg et al., 2003)

In 2012, 25.6% of Hispanic-American (13.6 million) families resided in poverty (Gabe, 2013). Hispanics represent 17.1% of the population, but account for 29.3% of the poor (Gabe, 2013). The participants in this research study reported income below $20,000 (22%) and $21,000 – 30,999 (23.2 %) which translates that the actual number of the participants living in poverty may be similar to the national level. Socioeconomic status is a factor that should be considered with the role of parent/child caregiver food purchaser and obesity. Socioeconomic status in Hispanic parent/child caregiver and food purchaser in relation to obesity should undergo further inquiry.

**Parent/Child Caregiver, Food Planner/Preparer, and Obesity**

I used the chi-square tests of independence to measure the relationship between food preparer/planner and obesity. I found that there was no significant association between food planner/preparer and obesity ($p = .70$). Therefore, the null hypothesis could not be rejected.

These results are inconsistent with what I found in the literature. However, there has been limited research conducted on the specific roles of parent/child caregiver and food preparer/planner as they relate to obesity. According to Pak-Gorstein et al. (2009), maternal influence begins prior to conception, and in many countries, the female of the household is the person who is usually responsible for preparing meals. In a family-centered Mexican society, food is usually prepared by the mothers/wives (Kittler & Sucher, 2012). Some evidence exists that family food preparers may influence their children's and spouses' eating habits in a non-interventional setting (Hannon, Bowen, Moinpour, and McLerran, 2003). One study found that over 12 weekly sessions, families, which included both children and parents, a reduction in dietary fat intake was produced, but at the four-year follow-up, the reduction was no longer in evidence (Nader, Sallis, Abramson, Broyles, Patterson, Senn, Rupp, and Nelson, 1992). Unhealthy eating behaviors may be supported by cultural practices, which influence food preparation and cooking methods. Arredondo et al. (2006) examined the influence of meal decision-making and preparation on Hispanic women's dietary practices. A positive statistical association between Hispanic women's acculturation level and shared decision-making style was found (Arredondo et al., 2006). However, decision-making included deciding on meals and snacks and preparation of meals. The study did not delineate or examine the roles parent/child caregiver and food planner/preparer as they relate to obesity. Lastly, Hispanics assent to the values of *machismo* and *marianismo*, which culturally influence the idealized, stereotypical gender roles of men and women in family life. Machismo is the value of masculinity that dictates that men are the providers and protectors of their family and that requires that they stifle outward displays of emotion (Santiago-Rivera et al., 2002). Cultural beliefs about gender roles may also play an important role in decision-making about food selection, purchases, and preparation for the family. It is important to understand what dietary cultural practices and/or preparation adult Hispanic parents/child caregivers continue to practice and provide to ensure a healthy family. More research needs to be completed in order to better comprehend how the family can influence healthy food choices and how to use this influence to improve dietary habits within the family (Shepherd and Raats, 1996). This is an area that should undergo further inquiry.

Other factors, such as time, may influence food purchases. In many Hispanic families, one or both parents are working full time or part time, and work reduces the amount of time parents spend at home. Because of time constraints, some families have resorted to consuming fast foods and eating dinner while watching television (Freedan, 2005). Lastly, Potenza's research (2003) demonstrated that Hispanic consumers prefer fresh, high-quality fruits and vegetables, low prices, and convenient location as a top priority in deciding where to shop. Further research is needed to analyze the depth of parent/child caregiver and food planner/preparer as these roles relate to obesity.

**Acculturation and Obesity**

I used point-biserial correlations to measure the relationship between acculturation and obesity. I found that there was no significant relationship between acculturation, BAS Hispanic Domain scores and obesity ($p$ = .19). Therefore, the null hypothesis could not be rejected. However, a weak negative correlation existed between BAS Hispanic Domain scores and obesity. Hence, lower BAS Hispanic Domain scores were associated with non-obese participants. A lower BAS Hispanic score means the participant is less likely to adhere to Hispanic culture and more likely to adhere to American culture. In other words, participants who abandoned their Hispanic traditions were less likely to be obese. However, I found that there was a statistically significant relationship between acculturation BAS non-Hispanic Domain scores and obesity ($p$ = .02). Therefore, the null hypothesis was rejected between acculturation and obesity. Higher BAS non-Hispanic Domain scores were associated with non-obese participants. Hence, participants who adopted the American culture were less likely to be obese.

These results both confirm and diverge with what I found in the literature review. A recent study (Isasi, Ayala, & Sotres-Alvarez, 2015) examined the association of obesity with acculturation in a large urban and diverse sample of United States Hispanic adults from the Bronx, Chicago, San Diego, and Miami. The study was a community-based cohort study of Hispanic adults aged 18–74 years ($N$ = 16,415) from urban areas. Height and weight were measured to calculate BMI. Acculturation was measured by the Short Acculturation Scale for Hispanics (SASH), an abbreviated 10-item version of Marin’s acculturation scale. Other immigration-related variables include place of birth, length of residency in the United States, and age at immigration. The prevalence of obesity was 42.4% for Hispanic women and 36.5% for Hispanic men. Overall, Chicago Hispanics had 42.1% prevalence of obesity. In addition, acculturation was not significantly associated with obesity (Isasi et al., 2015). A limitation of this study utilizing the SASH was the inability to capture biculturalism. Creighton, Goldman, Pebley, and Chung's (2012) study analyzed acculturation to account for the duration, generation, and race/ethnic difference in obesity in Los Angeles County. This study utilized indices designed specifically to measure acculturation, rather than proxy measures (e.g., duration and generation). The results showed that inclusion of the acculturation variables in analyses predicting obesity generally does not diminish the size, direction, or significance of duration, generation, and race/ethnic effects on obesity. In fact, including acculturation variables increases the size and significance of some estimates. Thus, the acculturation was not a predictor of obesity among Mexican origins.

It is possible that a more refined measure of acculturation could identify people of bicultural or with different degrees of acculturation across other domains that could reveal different dietary patterns and/or dietary acculturation. Dietary acculturation denotes the process occurring when minority group members take on the food choices and eating patterns of the host country (Satia-Abouta, 2003; CDC, 2012). There are factors that protect against dietary acculturation, including social networks from both ethnicities, inability to speak English, employment outside the home, and residing with older relatives (Sussner et al., 2008). However, several factors may contribute to dietary acculturation: television, mass media, and peer groups are elements that shape food-related attitudes and taste preferences, food procurement and preparation, and beliefs regarding ideal body size (Newby, 2007).

In contrast, acculturation within U.S. Hispanics, primarily Mexican-Americans, shows that Mexican-Americans tend to abandon traditional, healthful dietary practices in favor of processed convenience foods (Van Rompay et al., 2012 & Variyam, 2000; Ayala et al., 2008). More frequent intake from fast-food restaurants (Ayala et al., 2008; Van Wieren, 2011), consumption of more saturated fat (Maimous, 2008), more simple sugars (Gregory-Mercado, 2006), few fruits and vegetables (Ayala, 2008; Gregory-Mercado, 2006; Montez, 2008; Neuhouser et al., 2004), and lower dietary fiber (Maimous, 2008; Montez, 2008) have all been reported with acculturation among Mexican-Americans (Van Rompay et al., 2012). Thus, acculturation has been associated with increased obesity (Li, Goran, Kaur, Nollen, & Ahluwalia, 2007).

Romero-Gwynn and Gwynn (1997) measured changes in dietary choices by looking at how the frequency of consumption of selected foods changed on a continuum from less acculturated (Mexican food) to more acculturated (foods consumed in the United States). A formula was calculated to assess the percentage of change. Romero-Gwynn and Gwynn (1997) identified select foods that were sensitive to acculturation. Similarly, Satia-Abouta (2003) proposes a model of dietary acculturation that states that a complex relationship exists among demographic, socioeconomic, and cultural factors given exposure to the host culture. According to Satia-Abouta, these characteristics predict how much new immigrants' beliefs and attitudes may change concerning food purchase and preparation, taste preference, and food in general. Eventually, these factors can lead to changes in dietary intake (Satia-Abouta, 2003). Based on this model, data may be collected on taste preference and sociodemographic, cultural, psychosocial, and environmental factors.

The process of acculturation is complex; there is no consensus on the best approach for comprehensive assessments of acculturation in epidemiological studies (Isasi et al., 2015). Acculturation is defined as a unidimensional process in which the immigrant (minority) culture adopts the values, attitudes, beliefs, customs, and behavior of the new (majority) culture (Ghaddar et al., 2010, p. 192; Purnell & Paulanka, 2013, p. 8). Immigrants have given up most traits from the culture of origin (Ghaddar et al., 2010). Biculturalism is defined as a multidimensional process in which the immigrant maintains aspects of the culture of origin (minority) while also adopting elements from the new (majority) cultural group (Berry, 2005; Marin & Gamba, 1996; Schartz & Ugner, 2010). The immigrant acceptances the majority and minority cultures within their identity and engages in a positive intercultural exchange (Coatsworth, et al., 2005). Following immigration, a family may incorporate food choices common to U.S. culture into their diets/dietary acculturation. Further studies are required to explore Hispanic immigrants' acculturation and obesity. Additional research needs to be completed to understand the influence of second and third generation Hispanics that may affect families on healthy food choices (Shepherd & Raats, 1996). There is limited research on acculturation in the participants of parent/child caregiver and obesity in Hispanic families. Finally, an outcome in this study is demonstrated by a phenomena called biculturalism. Biculturalism as it relates to obesity in Hispanic family's requires further research inquiry.

**Dietary Intake of Saturated Fats and Obesity**

I used point-biserial correlations to measure the relationship between intake of saturated fat and obesity. I found that there was no significant relationship between intake of saturated fat and obesity ($p = .32$). Therefore, the null hypothesis was not rejected. The participants' reported saturated fats intake score $M = 15.92$ grams/day. Although, the BFSFVS simple scoring system indicates a category of excellent, the grams of saturated fats are more than the recommended daily amount of fat by the American Heart Association (AHA). The AHA (2015a) recommends a dietary pattern that achieves 5% to 6% of calories from saturated fat. The recommendations denotes, if a consumer requires about 2,000 calories a day, no more than 120 calories should come from saturated fats which is about 13 grams of saturated fats a day (AHA, 2015b). The participants dietary intake of saturated fat are unhealthy and exceed the recommendation from the American Heart Association. These results are consistent with what I found in the literature. The American diet contains an average of 11% of calories from saturated fatty acids, higher than recommended by the USDA (USDA & USDHHS, 2010, p. 25). Research has shown that saturated fats is associated with obesity (Ayala et al., 2008; Centrella-Nigro, 2009; Epstein et al., 2001; Flegal et al., 2002). However, this study's results could be related to an inaccurate self-report of dietary intake, or the participant population is less knowledgeable of avoiding foods containing saturated fats.

**Dietary Intake of Sugar and Obesity**

I used point-biserial correlations to measure the relationship between intake of sugar and obesity. I found that there was no significant relationship between intake of sugar and obesity (*p* = .34). Therefore, the null hypothesis was not rejected. The participants' reported the sugar intake score was *M* = 65.58 grams/day. The BFSFVS scoring system for sugar was depicted by an output in total sugar, grams and added sugar grams. The American Heart Association (AHA) recommends that women consume no more than six teaspoons, 100 calories or 25 grams, in added sugar and men no more than nine teaspoons, 150 calories or 37.5 grams (American Heart Association [AHA], 2015c). Hence, the participants' dietary intake of sugars is unhealthy and exceed the recommendation from the American Heart Association. These results are consistent with what I found in the literature. There is evidence that sugar and added sugar intake causes the following health conditions: obesity, high blood pressure, heart disease, and type 2 diabetes (American Heart Association, 2015b; Bermudez & Gao, 2010; Epstein et al., 2001; James, 2004; Larsson, Bergkvist, & Wolk, 2006; Sharkey et al., 2011; Van Rompay et al., 2012). Consequently, this study's results could be related to an inaccurate self-report of dietary intake or the participant population is less knowledgeable of avoiding foods containing sugars and added sugars.

**Dietary Intake of Fruits and Obesity**

I used point-biserial correlations to measure the relationship between intake of fruits and obesity. I found that there was no significant relationship between intake of fruits and obesity (*p* = .22). Therefore, the null hypothesis was not rejected. The participants' reported the fruits intake score was *M* = 1.24 servings/day. The BFSFVS scoring system ranged from excellent, $\geq \sim 5$ per day to poor, ~ 2 per day. Hence, the participants' dietary intake of fruits were poor. These results are not consistent with what I found in the literature.

Hispanic Americans, many continue to consume standard food items that are traditional to the Hispanic diet which include fresh vegetables and fruits (Heise, 2002). Consumption of fruits is related to a reduced risk of many chronic diseases and obesity (Epstein et al., 2001; NCCDPHP, 2013; USDA, 1999). Consequently, this study's results could be related to a participant population is less knowledgeable, lower SES, or lack of access to include fruits in their dietary intake.

**Dietary Intake of Vegetables and Obesity**

I used point-biserial correlations to measure the relationship between intake of vegetables and obesity. I found that there was no significant relationship between intake of vegetables and obesity ($p$ = .31). Therefore, the null hypothesis was not rejected. The participants' reported the vegetable intake score was $M$ = 1.03 servings/day. The BFSFVS scoring system range from excellent, $\geq \sim$ 5 per day to poor, $\sim$ 2 per day. Hence, the participants' dietary intake of vegetables were poor. These results are not consistent with what I found in the literature.

Hispanic Americans, many continue to consume standard food items that are traditional to the Hispanic diet which include fresh vegetables and fruits (Heise, 2002). However, vegetable intake is lower with American dietary choices (NCCDPHP, 2013; Robinson, 2008; USDA & USDHHS, 2010). Consuming vegetables is related to a reduced risk of many chronic diseases and obesity (Sallis & Glanz, 2009; Thompson & Subar, 2013). Consequently, this study's results could be related to a participant population is less knowledgeable: SES, lack of access to include fresh vegetables in their dietary intake or more acculturated with the American culture.

This study's participants may be lacking in nutritional knowledge including: fat, sugar, and fruits and vegetables in their daily dietary consumption in relation to their health status. Knowledge is recognized to be one of the components for change of food habits (Feren, Torheim, & Lillegard, 2011). Nutritional knowledge can be identified in three types: awareness, knowledge of principles, and how-to knowledge (Rogers, 1983). Awareness of a relationship between diet and disease may stimulate interesting in learning about nutrition and healthful dietary intake habits, thus becoming the first step in acquiring the knowledge necessary for dietary improvement (Guthrie, Derby, & Levy, 1990). Subsequently, knowledge of nutrition principles encompasses health-oriented and food-related principles. Health-oriented principles provide a deeper understanding of diet-health relationship, thereby improving an individual's ability to understand and implement dietary change. Food-related principles facilitate dietary improvement by providing relatively simple "decision rules" for consumers to use in making food choices (Guthrie et al., 1990). Food guides may be seen as providing consumers with a set of principles for translating dietary recommendation into behavioral terms. Finally, Rogers (1983) describes how-to knowledge as the specific knowledge and skills guiding day-to-day implementation of a desired behavior of choosing a healthful diet. General knowledge of food composition and knowledge gained by reading and interpreting food label information properly are examples of how-to knowledge (Guthrie et al., 1990).

Consequently, Hispanic parent/child caregiver nutritional knowledge should undergo further inquiry.

**Acculturation; Gender; Dietary Intake of Saturated Fats, Sugar, Fruits and Vegetables; Role as Food Purchaser; Role as Meal Planner and Preparer; and Socioeconomic Status**

I used bivariate correlation to measure the relationship between acculturation, fats, sugars, and fruits and vegetables. I found that there were a significant positive relationship between saturated fat intake and sugar intake ($p < .001$). I found that there were significant positive relationship between fruit intake and vegetable intake ($p < .001$). I found that there were significant positive relationship between fruit intake and sugar intake ($p = .001$). I found that there were significant negative relationship between BAS Hispanic Domain and BAS non-Hispanic Domain ($p < .001$). Therefore, the null hypothesis was rejected. These results are consistent with what I found in the literature (Khan et al., 1997; Van Rompay et al., 2012).

**Acculturation; Gender; Dietary Intake of Saturated Fats, Sugar, Fruits and Vegetables; Role as Food Purchaser; Role as Meal Planner and Preparer; Socioeconomic Status; and Obesity**

I used multiple logistic regression to examine whether acculturation; gender; dietary intake of saturated fats, sugar, fruits and vegetables; role as food purchaser; role as food planner/preparer; and socioeconomic status were significant predictors of obesity. I found that gender ($p = .05$) and BAS non-Hispanic Domain scores ($p = .03$) were significant predictors of obesity. The log odds of developing obesity were 2.46 times lower in males compared to females. Hence, for every one unit increase in BAS non-Hispanic Domain scores, the log odds of being classified as obese increased by 1.737 times. Therefore, the null hypothesis that gender and BAS non-Hispanic Domain scores was not a predictor of obesity was rejected.

These results both confirm and diverge with what I found in the literature. Many studies have confirmed that the female gender is a predictor of obesity (Sobal et al., 2009; Unger & Schwartz, 2012; Zhang & Wang, 2004). Creighton et al.'s (2012) results did not support acculturation as a predictor in obesity. Creighton et al. (2012) suggest the acculturation process may be better captured by observing changes in individual immigrants and non-immigrants and their children and grandchildren over time rather than comparing groups cross-sectionally. In addition, Creighton et al. (2012) suggest that economic factors rather than cultural factors may drive the consumption of "American" foods by relatively low cost and availability. However, a recent study (Isasi et al., 2015) examined the association of obesity with acculturation, which was measured by the SASH, in which all subscale domains were not utilized to calculate BAS non-Hispanic Domain score or BAS Hispanic Domain score. Further research is needed utilizing the Marins' acculturation tool and the BAS that includes both domains, non-Hispanic and Hispanic, enabling the calculation of potential acculturation and/or biculturalism. Lastly, further longitudinal acculturation studies are needed.

## Application of the Socioecological Model

The SEM integrates multiple levels that affect behavior and/or influence health behaviors and health outcomes. The levels of influence are based on five key components: intrapersonal, interpersonal, institutional, community, and public policy (McLeroy et al., 1988). The intrapersonal level consists of characteristics of the individual, including attitudes, behaviors, self-concept, and skills. The interpersonal level includes support systems like the family, primary groups, and social networks, both formal and informal. The institutional level includes social institutions with organizational characteristics and formal and informal operational rules and regulations (McLeroy et al., 1988; Freedman et al., 1999). The community level involves relationships within organizations and informal networks with defined boundaries, such as a neighborhood. The last level, public policy, consists of local, state, and national policies and laws (McLeroy et al., 1988).

The SEM provides a framework to illustrate the incorporation of prevention and intervention targeting obesity. SEM is characterized as an interdisciplinary approach to shaping an individual's food choices that may lead to obesity. The most effective interventions have been shown to be the ones involving several components.

**Intrapersonal Factors**

Intrapersonal factors are characteristics within the control of an individual (Fitzgerald & Spaccarotella, 2009). Individual factors, including gender, age, race/ethnicity, genetics, and gender, all play a part in a family's or an individual's physical activity patterns and food intake. An individual's or family's knowledge, attitude, beliefs, and behaviors may be considered. At this level, a lack of cooking skills and knowledge of nutrition, as well as taste preferences (Shepherd & Raats, 1996) act as barriers to choosing a diet that is healthy. In particular, research shows that barriers to the intake of fruits and vegetables may include inadequate cooking skills (Hughes et al., 2004) and low nutrition knowledge (Wardle et al., 2000). The nutrition-related skill of using food labels to obtain and understand nutrition also has a positive relation to nutrition knowledge (Petrovici & Ritson, 2006), as well as to fruit and vegetable intake (Fitzgerald et al., 2008; Fitzgerald & Spaccarotella, 2009; Satia et al., 2005).

The intrapersonal factors that were examined in the current study are acculturation, gender, socioeconomic status and dietary intake of fats, sugar, fruits and vegetables. Gender and BAS domain score were predictive of obesity among the sample population. These results may have been influenced by the fact that the sample was influenced by the objective of the community organization. Thus, these influences (dietary knowledge, healthy nutrition habits) may have had a stronger affect on the outcome come of obesity. Previous studies have associated lack of dietary knowledge and poor nutritional habits with obesity (Centrella-Nigro, 2009; Guendelman & Abrams, 1995; Levi et al., 2013; Magnusson, Hulthén, & Kjellgren, 2005; Pérez-Escamilla & Putnik, 2007). The fact that the sample population had some dietary knowledge may provide the rationale for the fact that a statistically significant relationship was not found between the aforementioned variables and obesity.

**Interpersonal Factors**

Interpersonal factors involve the primary social relationships surrounding the affects that social traditions, culture, and role expectations have on the patterns and practices surrounding eating within family, friends, and peer groups. These include primary groups; social networks, both formal and informal; and social support systems such as friends, family, peers, and coworkers that provide role definition, support, and social identity (McLeroy et al., 1988; Robinson, 2008). Studies have shown that intake of food among children is related to both the food intake and the nutrition knowledge of their parents (Gibson et al., 1998; Reinaerts et al., 2007). Children and adolescents tend to associate healthy foods with parents (Shepherd et al., 2006). Educational programs to increase peer support for good nutritional choices and nutrition knowledge may help in overcoming the barriers. Lifestyle behaviors are influenced by socioeconomic factors. For example, among families in which the mother works full-time, research reports a lower frequency of weekly family meals (Neumark-Sztainer et al., 2003). This association could be due to the affordability and convenience of meals that are not prepared in the home and/or increased time constraints having to do with employment. A healthier food choice within the home and the availability of family meals is related to eating healthful diets (Neumark-Sztainer et al., 2003). In addition, lack of time may be a barrier for healthy eating (Jenkins & Horner, 2005; King et al., 2000). Lastly, computer use or television viewing may be an intrapersonal or interpersonal factor since it can apply to either an entire family or to an individual, where they are influenced by such factors at the public policy level as food advertisements (Fitzgerald & Spaccarotella, 2009). Children’s requests for advertised foods are associated with greater screen time; more sedentary behaviors (Kaiser, 2004); and eating candy, fast food, and sugar sweetened drinks (Wiecha et al., 2006).

The interpersonal factors that were examined in the current study are acculturation. Although not measured in analysis, part of the inclusion criteria for the participants were to identify themselves as a parent/child caregiver. The process of acculturation influences families' dietary choices (Ayala et al., 2008; Mercado & Fileti, 2010; Satia-Abouta, 2003). Parental involvement is identified as critical in obtaining favorable outcomes from interventions directed at obtaining sustained weight management in children (Jackson, Mannix, Faga, & McDonald, 2005; Myers & Vargas, 2000). Parents/child caregivers are the primary change agents in families in the home environment and the children's activity habits and food habits. In the United States, family meals are associated with numerous social, psychological, and health benefits for both parents and children (Anderson & Whitaker, 2010; USDHHS, 2013; Washington, 2008). Studies have shown that children who belong to families who eat together frequently have improved nutritional status (Jackson et al., 2005; Raza, 2010; Robinson, 2008; Sealy, 2010). Young (2006) described that eating family meals is pertinent to an increased consumption of healthful foods. There is a direct relationship between family meals and intake of fruits, vegetables, and numerous beneficial nutrients including fiber, calcium, iron, and vitamin C (Ogden et al., 2010) as well as decreased fat intake (Sharkey et al., 2012). Families that eat meals together may have a better understanding of or stronger motivation for health behaviors (Harris et al., 2006), as well as overall healthier food environments and an increased availability of healthful foods, although limited data exists examining this relationship (Ding et al., 2012).

However, this belief may assume meals are home prepared; such meals are generally more healthful than meals purchased outside the home. Despite the advantages of family meals, the incidence is decreasing in the United States. According to parents, barriers to eating with families include busy schedules, working parents who find it difficult to manage meal organization, and demands of their family (Gance-Cleveland et al., 2009; James, 2004). Families often rely on restaurants, fast foods, and convenience foods, which leads the daily nutritional intake to contain food with a decrease in nutritional value (Harris et al., 2006).

The interpersonal factors that were examined in the current study are dietary intake of fats, sugar, fruits, and vegetables. Dietary intake disconfirmed the literature. These results may have been influenced by the fact that the sample was influenced by the objectives of the community organization. However, the fact that the inclusion criteria generated a sample population which influenced the predictor of obesity was a fragment of the SEM. This factor suggests Hispanic families may be the key to developing, implementing, and evaluating comprehensive interventions. This concept of role as food purchaser and role as food planner/preparer and obesity in the Hispanic population extended the knowledge in the discipline of social science.

**Institutional Factors**

The organization and/or institutional levels include operational rules, regulations, policies, and informal structures (Robinson, 2008). People spend a majority of their lives in organizational settings; these settings have a strong affect on health-related behaviors (Riner & Sands, 2008). These social institutions include neighborhoods, workplaces, schools, recreation facilities, faith-based organizations, and food retail and food service establishments (Freedman et al., 1999; McLeroy et al., 1988). All these settings play a crucial role in determining families' and individuals' choices of physical activity and food choices and environment through the health information they provide to consumers. Organizations may provide important sources of social and economic support and may shape values and attitudes through social and organizational culture (McLeroy et al., 1998).

Acculturation may be a barrier at both the community and/or institutional and the interpersonal levels because culture can be explained as a component of the social environment, mostly within the community and the family. Social norms, or guidelines that may regulate behaviors, beliefs, and thoughts, are based on the society's values and are reflected in both laws and personal expectations. As they concern physical activity and nutrition, these norms may affect the choice of what foods and beverages are consumed and how and when they are consumed; how much physical activity an individual incorporates into his or her life; and the acceptable ranges of body weight. Studies have revealed that greater acculturation is linked to lower intake of fruits and vegetables, (Neuhouser et al., 2004), as well as nutrients like vitamins and minerals, and to a greater consumption of fat among Hispanics (Dixon et al., 2000).

There were no institutional factors that were examined among the sample population. However, the organization may have influenced the results by the fact that the sample was congregated by the purpose/objective of the community organization. In addition, since organizational settings have a significant affect on health behavior, the results of the study may describe the relationship through the acculturation process affecting obesity in the Hispanic family. The process of acculturation and biculturalism requires further research.

**Community Factors**

Community factors are norms and social networks, or standards that exist as formal or informal relationships among groups, individuals, and organizations (Robinson, 2008). Many sectors, including public health and health care systems, government, the media, and agriculture, can influence communities. These sectors can be important in deciding the degree to which families and individuals have access to the chance for physical activity in their communities, as well as to healthy food. Eating behaviors may be influenced by individual environmental socioeconomic characteristics. Eating behaviors and food choices may be influenced by fewer stores offering healthy foods (Horowitz, Colson, Hebert, & Lancaster, 2004), limited food availability, and a greater availability of fast-food restaurants (Morland et al., 2002) in more socioeconomically limited communities. In addition, a decreased access to a private means of transportation (Morland et al., 2002) impedes the availability of better food to the community. Frequent food intake at restaurants leads to intake of foods in larger portions that high in calories, fat, and sodium (Popkin et al., 2005).

Multiple Hispanic cultural values have been documented in empirical literature (Lara et al., 2005; USDHHS, 2013; Wallace et al., 2010). Hispanics are a heterogeneous group; many or most Hispanics share a set of cultural values, regardless of country of origin, acculturation level, education, or income (USDHHS, 2013). Hispanics vary in the degree to which they adhere to these cultural values. The Hispanic population’s culture views obesity by their understanding of the complexity of the cause, evolution, and treatment of obesity as an illness. All cultural values have positive and negative components (Bruss, 2005).

One of the most central values to Hispanic culture is the family, or familismo (familio). Familismo values of family over the community or the individual and is expressed by family tradition, loyalty, unity, solidarity, and reciprocity among family members (Smith, 2000). Hispanics assent to the values of "machismo" and "marianismo," which culturally influence the idealized, stereotypical gender roles of men and women in family life. Cultural beliefs about gender roles may also play an important role in decision-making about food selection, purchases, and preparation for the family. As noted by Santiago-Rivera et al. (2003), familismo remains strong among Hispanics across generations, regardless of how long a family has resided in the United States (Garza & Watts, 2010).

Hispanic families often combine Western medicine with traditional health care practices. Hispanic families are more likely to seek out folk medicine and home remedies this is the general population in the United States (CDC Healthy Communities Program, 2015; Spector, 2012). Western medicine may be more widely used, but Hispanic individuals and families often try traditional practices when they cannot afford Western health care (CDC Healthy Communities Program, 2015). A vital aspect of Hispanic health still lies in folk medicine (Zaldívar & Smolowitz, 1994). The primary providers of health in the community and the home are women. Older women in particular serve as *parteras* and *curanderas*, or folk healers, and they carry on the traditional knowledge about illness and health. *Curandismo* is closely related to the practice of religion.

There were no community factors that were examined as predictors of obesity among the sample population. However, the community influenced the results by the fact that the samples were specific inclusion criteria, role as food purchaser, and role as food planner/preparer and identified as a parent/child caregiver. Although these factors were not measured, the participants responded to the survey with their beliefs influencing their responses. Understanding common cultural beliefs and values that thread through the groups will help provide a context for understanding factors that may influence the development of preventative tailored intervention of obesity.

**Public Policy Factors**

The last level of factors, public policy, consists of local, state, and national laws and policies that support or regulate healthy practices and actions for early detection, disease prevention, and control. For example, the Supplemental Nutrition Assistance Program (SNAP, commonly known as "food stamps") is an important resource for reducing food insecurity in low-income populations (Fox et al., 2004). A cyclic eating pattern may develop when using SNAP versus at other times that is characterized by excessive eating, resulting in the possibility that individuals may not be eating enough to achieve a healthful diet (Dinour, Bergen, & Yeh, 2007). Individuals' food intake patterns may be affected by policies that influence food cost, since less nutritional foods are reported to cost less than healthy foods (Monsivais & Drewnowski, 2007), and cost is one factor that determines food choice (International Food Information Council Foundation, 2011). Lastly, since schools house the majority of United States Hispanic children, they provide an ideal medium to enact wellness policies (USDA, USDHHS, 2010).

There were no public policy factors that were examined among the sample population. However, the public policy factor may have influenced this study. The survey did not query participants to disclose information regarding SNAP. Multiple studies discuss obesity prevention programs and policies need to address food insecurity and socioeconomic status (Martin, 2007; Sealy, 2010; Vieweg et al., 2007; Zhang & Wang, 2004). In addition, the public policy factor may be influenced by future replicative studies. This study supports Healthy People 2020, which encourages adults, adolescents, and children to eat a healthful diet and stay physically active, leading to a decrease in their risk of a number of adult-onset or developing health conditions and diseases, including heart disease and diabetes. Adults who maintain a healthy weight are less likely to die prematurely.

## Study Limitations

This study had a number of limitations that may have affected research findings. The limitations are detailed below.

1. Even though the survey was anonymous in nature, participants may have wanted to be viewed in a better light and thus marked the socially accepted answer for fear of being viewed negatively. Surveys were distributed face to face or in person, with contact between the participants and the researcher.

2. The participants were provided a $5.00 Walmart gift card after the completion of the survey for compensation for their time. The participants' incentive may have led to quick and hasty responses, causing them lesser forethought about their responses.

3. The survey may have been too long and participants may have had time restraints and/or may have become frustrated, which may have resulted in the participants not fully reading the questions and thus marking the answers inaccurately.

4. The sample may not have been an accurate representative of the community, since this was a volunteer sample and heavily weighted toward those attending the Latina Talk and Tea organization meetings.

5. The sample may have not been an accurate representative of the community since the Latina Talk and Tea members attended meetings that discussed health-related topics and thus participants had more accurate knowledge of healthy food choices.

6. The data were self-reported; thus the participants may have not been entirely truthful in their response. Recall bias may have also occurred.

7. The BMI was calculated by a self-report of height and weight which may have provided inaccuracy concerning classification of weight status, obesity. Data collection of height and weight by researcher's participants presents the possibility of human error (Babbie, 2012).

8. Participants' BMI index was calculated to determine their classification of weight status. This research study examined the obese weight status. This study did not examine other weight statuses such as overweight or underweight. Hence, the sample may have not been an accurate representation of the weight status, obesity.

9. Obesity was measured and calculated by BMI. There are arguments in social science as to which measurement is most accurate to measure obesity: BMI, waist

circumference, waist-to-hips ratio, and body fat percentages (Clark, 2013; CDC, 2015a & Harvard T.H. Chan, 2016).

10. “Hispanic” includes a broad range of Latin sub-populations. This study did not examine differences between these sub groups. The sample may not have been an accurate representative of the community since the majority of the participants immigrated from Mexico, which may not be reflective of all Hispanic beliefs, dietary practices, or the acculturation process of residing in the United States.

11. The sample was lacking analysis of birth location and length of time in the U.S. Analysis of this data may provide a specific time period that health care providers may need to intervene or to promote health education to families acculturating to the United States.

12. The influence of seasonal food availability on consumption of food was not considered in this study. Data were collected throughout the winter months. It is possible that different types and different servings of fruits and vegetable may be consumed in different seasons. The varying price of produce by season may also change consumption patterns.

13. The BAS domains’ concept of Biculturalism was not analyzed.

## Implications for Study Findings and for Positive Social Change

The Hispanic-American population is estimated to have the second-highest prevalence of obesity in the United States (CDC, 2011), with multiple comorbidities. Obese individuals burden themselves as well as society as a whole. According to the USDHHS, four of the leading 10 causes of death are significantly related to dietary factors, including cancer, coronary heart disease, stroke, and type 2 diabetes (Petti & Cowell, 2011; Robinson, 2008; USDHHS, 2013). Dietary practices can also contribute to high blood pressure, osteoporosis, and iron deficiency anemia (Butte et al., 2006; Gleason et al., 2000; Patil et al., 2009; Robinson, 2008). Statistics revealed that one out of five deaths are related to obesity (Laidman, 2013) and the total cost attributable to obesity amounted to $147 billion in 2008 (CDC, 2015a). The rising rates of obesity have led to increased morbidity and mortality and shortened projected longevity for children and adolescents, who are expected to have a shorter lifespan than their parents or family members from past generations (Berry et al., 2009; Braveman et al., 2010). Obesity can be prevented and reversed with attention to modifiable risk factors (Braveman et al., 2010; Poobalan et al., 2008; Savage et al., 2007; Sussner et al., 2008; Washington, 2008). KCHD (2011, p. 48) completed a root cause analysis which includes a variety of risk, direct and indirect contributing factors of obesity in Kane County.

Unlike previous studies that focused on factors associated with prevalence of the complication, this study focused on understanding factors that influence the incidence of obesity in the Hispanic family residing in Aurora Illinois. The study supported Kane County 2012–2016 Community Health Improvement Plan (KCCHIP) risk factors for an unhealthy diet, include direct contributing factors such as limited access to fresh vegetables and fruits; poor food literacy; social norms and cultural values. The KCCHIP risk factors for an unhealthy diet which include indirect contributing factors such as healthy options are more expensive, limited or not available, Lastly, additional risk factors include: an abundance of unhealthy nutritional options; nutrition education is a low priority; mothers are not breastfeeding and unhealthy behaviors that have been learned from friends and/or families.

The city of Aurora in Kane County, Illinois has the fifth-largest population which contains the highest proportion of Hispanic residents The Kane County 2012–2016 Community Health Improvement Plan (KCCHIP) reports that, from the adult population in Kane County, 34.5% are overweight and 29.4% are obese (Kane County Health Department [KCHD], 2011, p. 17). Chronic diseases accounted for 80% of all deaths in Kane County in 2010 (KCHD, 2011, p. 49). Forty-seven obese participants in the study may experience the complications and possibly the comorbidity associated with obesity. Although, this study did not analyze the number of participants of an overweight weight status, this study provided support for recommendations for future research studies to include overweight weight status in Hispanic parents/child caregivers in Aurora, Illinois. Lastly, Kane County has a rapidly growing population, and chronic diseases will become more prevalent unless preventative action is completed.

Further, based on the results presented in Chapter 4, Hispanic families may benefit from culturally congruent health promotion and preventative programs tailored to their weight status. This study's results revealed a positive correlation between non-Hispanic Doman scores and obesity; gender and BAS non-Hispanic Domain scores were significant predictors of obesity; developing obesity was 2.46 times lower in males and obesity increased 1.737 times with every one unit increase BAS non-Hispanic Domain scores. Although, the results describe the BAS non-Hispanic Domain, the multidimensional process, biculturalism may be arising in Aurora Illinois. The Hispanic

Aurora, Illinois immigrant may be accepting the majority and minority cultures within their identity and engages in a positive intercultural exchange. Following immigration, a family may incorporate food choices common to U.S. culture into their dietary intake. This study's results describe obesity increased 1.737 times with every one unit increase BAS non-Hispanic. This result highlights the acculturation process occurring in Hispanic parent/child caregiver residing Aurora Illinois.

In addition, this study provided an increased understanding of how the factor gender contributed to obesity in Hispanic parents/child caregivers in Aurora, Illinois. From 2007 to 2010, women of Mexican-American heritage were 40% more likely to be overweight than non-Hispanic White women (United States Department of Health and Human Services. The Office of Minority Health [OMH], 2015b). The National Health Interview Survey (NHIS) 2007–2010 states that 33.1% of Hispanic women are obese and 44.6% of Hispanic women are overweight, while 30.7% of Hispanic men are obese and 33.6% of Hispanic men are overweight. One study has shown that Hispanic women born in the United States have higher rates of obesity than women born in other countries (Hubert, Snider, & Winkleby, 2005). This study's results revealed gender and BAS non-Hispanic Domain scores were significant predictors of obesity and developing obesity was 2.46 times lower in males in Hispanic parents/child caregiver in Aurora Illinois. Further research inquiry is needed to examine gender, BAS Domain scores and obesity in Hispanic parents/child caregiver in Aurora Illinois.

Lastly, these results contribute to Hispanic community's social change initiatives: Kane County Community Healthy Improvement Plan, Latina Talk and Tea members of

Aurora; the Healthy Living Council of Aurora; Quality of Kane County; Fit for Kids 2020 Plan; IAPO; Healthy People 2020 and Michelle Obama's Let's Move. This study provided support for recommendations for future research studies to include the process of acculturation, biculturalism, gender and socioeconomic status on obesity in Hispanic parents/child caregivers across the lifespan in Aurora, Illinois. Although not all factors are preventable, targeting these participants' families based on risk factors may improve outcomes. While the ultimate goal is prevention of obesity to families and children in Hispanic families, decreasing obesity to an overweight status would be an improvement of overall healthy and complications from obesity.

**Recommendations for Further Study**

First, the city of Aurora, located 40 miles west of Chicago in Kane County, Illinois, is ranked as fifth largest in population with the highest proportion of Hispanic residents in the state. The Kane County 2012–2016 Community Health Improvement Plan (KCCHIP) reports that, from the adult population in Kane County, 34.5% are overweight and 29.4% are obese (KCHD, 2011, p. 17). Obesity is a key risk factor for chronic disease, increasing by 9% from 2002 to 2011 (KCHD, 2011, p. 41). Kane County has three geographical divisions: North, Central, and South. Southern Kane County includes the cities of Aurora, Batavia, Kaneville, and Sugar Grove. As indicated in the Kane County Community Health Survey 2011, Southern Kane County reports that 33% are overweight and 37% are obese (KCHD, 2011, p. 41). Kane County's highest rates of obesity are among populations with incomes $25,000 or less and in people 35 to 75 years of age (KCHD, 2011). Aurora resides in Kane County, which is diverse ethnically and economically. Replicating this study in all geographical areas of Aurora, which will include fewer economic resources, may give health officials the information needed to identify factors that are associated with obesity in Hispanic families in Aurora, Illinois. This may provide further recommendations to health officials and policymakers concerning obesity in Hispanic families in the Midwest.

Second, the sample was more knowledgeable on health topics and thus may have had healthier dietary intake. Consequently, recruiting a sample who had some/none healthy dietary intake could have been more representative of the Aurora, Illinois, population and may have allowed this researcher to be able to identify a relationship between the variables under study.

Third, the BAS for Hispanics, developed by Marin and Gamba (1996) in 1996, measured two cultural dimensions (Hispanic and non-Hispanic), and each response category included four items on a Likert-type scale. Participants read each of the 24 statements, 12 items in each domain, which measured three areas related to language. The BAS participants were assigned to two domains, which defined each respondent's level of acculturation (Marin & Gamba, 1996). The researcher assigned acculturation categories to the respondents (Marin & Gamba, 1996). A score of 2.5 is utilized as a cut-off to indicate whether adherence to each cultural domain is high or low. A score less than 2.5 on either of the 12-item domains indicates low acculturation to that culture. A high score greater than 2.5 on either of the domains indicates high acculturation to that culture. In both domains, a score higher than 2.5 indicates that the respondent is bicultural. An individual scoring above 2.5 in both domains would be considered to have high biculturalism. A low score on the White domain and a high score on the Hispanic domain suggest high acculturation to the Hispanic culture and low acculturation to White culture. The fact that the scale measures two cultural domains allows the instrument to measure the complex process of biculturalism. Replicating the study using the domains may produce results to assist health care providers' information to intervene or to promote health education and to prevent and decrease obesity and chronic illness in Hispanic families in the United States. However, combining each of the domains may make it more difficult to identify statistically significant relationships, specifically when the sample size is small. Replicating the study with a larger sample may yield different results.

Fourth, a qualitative study integrating grounded theory and the SEM of obesity may have been a more appropriate approach in examining socioecological factors associated with obesity among the sample population. Qualitative inquiry allows researchers to identify factors or themes in the data, which would have allowed a theory to be developed that outlined which factors under study contributed to the decision of the dietary intake and healthy choices. Qualitative methodology also allows a researcher to collect richer descriptive data, as the open-ended nature of the questions does not restrict the type of response the participants can make, unlike with quantitative inquiry. Replicating the current study using qualitative methodology may produce different results.

Fifth, data collection took place a through a very specific organization, meaning that the results may not have been truly representative of the surrounding community.

Replicating the study using a variety of community organizations may have allowed an association to be identified. However, time constraints and limited resources impeded efforts. In addition, the number of participants that completed the survey in the sample was not equal in the number of males and females that participated in the study, which may have affected research findings. Having an equal gender representation in the sample may have allowed for a more accurate measure of the variable under study and thus may have revealed significant relationships. Efforts to duplicate the study recruiting a variety of community organizations ensuring equal male and female representation should be instituted.

Moreover, if allowed by time and resources, a longitudinal study following a prospective cohort of Hispanics from the time of immigration would offer important information about not only dietary acculturation, but also process of acculturation itself. A project of this reach would ideally include nutritionists, psychologists, physicians, anthropologists, public health experts, and physicians. Information regarding changes in acculturation and dietary acculturation, as well as psychological variables, dietary habits, health behaviors, and obesity and their respective influence on mortality and morbidity could be collected and analyzed. Although Central and South Americans, Cuban-Americans, Mexican-Americans, and Puerto Ricans should be identified to measure outcomes, those habits that promote health in Hispanics should be explored for their potential in promoting health in the U.S. population at large.

## Conclusion

Obesity has increased over the past 30 years among adults and children in the United States. All generations are at risk for cardiovascular disease, diabetes, hypertension, and comorbidities. Parents and child caregivers play key roles in the decisions in family health, the development of obesity, food choices, and eating patterns. Guided by the SEM. This study was the first to examine socioecological and sociodemographic factors associated with obesity among Hispanic parents/child caregivers (18 years of age and older) who reside in Aurora, Illinois. The socioecological factors included: acculturation, dietary intake of saturated fats, dietary intake of sugar, dietary intake of fruits, and dietary intake of vegetables. Sociodemographic factors included: gender, role as food purchaser, role as food planner/preparer, and obesity.

The primary aim of this study was to examine factors that were associated with obesity among Hispanic parents/child caregivers (18 years of age and older) who reside in Aurora, Illinois. Data were collected utilizing a three paper-based survey: a demographic survey, the BFSFVS and the BAS for Hispanics. Venue-based sampling methods were used to recruit the volunteer sample of 165 Hispanic parents/child caregivers residing in Aurora Illinois. Using a cross-sectional, correlational, and predictive research design, I attempted to answer three research questions and ten hypotheses that guided the study. I used point-biserial correlations, chi-square, and multiple logistic regression to test ten hypotheses. Study results revealed a positive correlation between saturated fats and sugar intake and between fruit and vegetable intake; and a negative correlation between BAS Hispanic and non-Hispanic Domains.

Further, gender and BAS non-Hispanic Domain scores were significant predictors of obesity where developing obesity was 2.46 times lower in males compared to females and obesity increased 1.737 times with every one unit increase in BAS non-Hispanic Domain scores. This study is the first study in which a researcher identified the roles of parent/child caregiver, food purchaser, and food planner/preparer as an inclusion criteria.

The SEM provided a framework to illustrate how all components shape an individual's food choices that may lead to obesity. The most effective interventions have been shown to be those that involve several components. Using several components influences diet patterns, including factors like age, gender, income, race/ethnicity, and genetics. In addition, components that been found to effectively improve dietary behaviors include nutrition knowledge, food purchasing behaviors, food availability, financial resources, and cultural attitudes and beliefs. Environmental settings/factors (schools, workplace, faith-based organizations, foodservice and food retailers, family eating patterns, and availability of food) play an integral role in affecting individuals' and families' food choices. Communities may be influenced by many different sectors, including agriculture, media, industry, public health and health care systems, and government. These sectors can be significant in determining how accessible healthy food is to individuals and families in their communities. Social and cultural norms guide individuals' beliefs and behaviors. An outcome in this study is demonstrated by a phenomena called biculturalism. Minimal research has been conducted on the acculturation process in Hispanic family's and the relationship to obesity. This research study provided an awareness of additional research inquiry is needed.

Lastly, this study's results contribute to Hispanic communities social change initiatives: Kane County Community Health Improvement Plan, Latina Talk and Tea members; the Healthy Living Council of Aurora; Quality of Kane County; Fit for Kids 2020 Plan; IAPO; Healthy People 2020 and Michelle Obama's Let's Move! On a local level, this research study supported the Kane County 2040 Plan ensuring Healthy People, Healthy Living, Healthy Communities in Kane County and the vision of having the healthiest residents in Illinois. Kane County 2012–2016 Community Health Improvement Plan (KCHD, 2011, p. 45) identifies obesity as one of the six major threats to Kane County residents community health and well-being. This study's recommendations of further research inquiry in Hispanic parent/child caregiver could be utilized in the current partnerships and coalitions active in the community that are addressing community health issues: Activate Elgin, Perinatal Committee, Kane Community Health Access Integrated Network, Kane Community Continuum of Care, Kane County Breastfeeding Coalition, Compañeros en Salud, All Our Kids Early Childhood Network, Kane County Healthy Places Coalition, and Home Visitation Collaborative.

On a national level this research study supported some of the Healthy People 2020 objectives relating to weight status and obesity (Appendix A). Nutrition and Weight Status Objectives 8–11 and 14–18 focus on reducing the number of adults, adolescents, and children who are obese and on preventing inappropriate weight gain in youth and adults (Healthypeople.gov, 2015b). The most relevant objective to this study is the Nutrition and Weight Status Objective 8, which advocates increasing the proportion of adults who are at a healthy weight. In addition, Nutrition and Weight Status Objectives

14–18 concentrate on food and nutrition consumption; these objectives include increasing the amount of fruits and vegetables in the diets of the population aged 2 years and older and reducing the consumption of saturated fats and calories from solid fats and added sugars in the population aged 2 years and older (Healthypeople.gov, 2015b). Nutrition and Weight Status objectives are related to this research study, which focused on increasing the number of Hispanic families at a healthy weight. This research study's findings may be used to assist the forward movement of accomplishing the Healthy People 2020 objectives in the city of Aurora, Illinois.

Although there has been some improvement in combating obesity in the United States, before the United States can affect positive change in its efforts to assist in decreasing and alleviating obesity, there must be a paradigm shift in the prevention and treatment of obesity-related problems. In addition, due to Hispanic population growth, the prevention and treatment programs need to be tailored to Hispanic families. To develop obesity prevention programs that are successful, the relationships between obesity and nutrition/dietary intake, education, gender, age, and acculturation must be addressed in the development of successful nutrition interventions. Given the current and projected affect of obesity in the Hispanic population, further research and application of findings should be explored as an important tool to improve the quality of life and health of Hispanic families. It is therefore necessary for society to place more emphasis on improving the overall quality of life of the community, including cultural beliefs and practices, in these programs to prevent and treat obesity. This study suggests further studies to include: larger samples, over longer periods of time, examining socioeconomic status and length duration of time in the obese Hispanic parent/child caregiver in Aurora, Illinois.

A coordinated system-wide approach from all sectors of society, including families and individuals, communities, educators, organizations, businesses, health professionals, and policymakers working together through partnership can improve the health of the community by targeting effective disease management and prevention. A positive health outcome is essential to the overall well-being in our society. It aids and promotes the fulfillment of individual goals and achievements; the longevity of family, parents, and children; and economic growth in society.

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Appendix A: Healthy People 2020 Nutrition and Weight Status Objectives

Objective NWS 8: To increase the proportion of adults who are at a healthy weight.

Objective NWS 9: To reduce the proportion of adults who are obese.

Objective NWS 10: To reduce the proportion of children and adolescents who are considered obese. (Includes four sub-objectives.)

10.1: To reduce the proportion of children ages 2 to 5 years who are considered obese.

10.2: To reduce the proportion of children ages 6 to 11 years who are considered obese.

10.3 : To reduce the proportion of adolescents ages 12 to 19 years who are considered obese.

10.4: To reduce the proportion of children and adolescents aged 2 to 19 years who are considered obese.

Objective NWS 11 : To prevent inappropriate weight gain in youth and adults. (Contains five sub-objectives.)

11.1 : To prevent inappropriate weight gain in children ages 2 to 5 years.

11.2 : To prevent inappropriate weight gain in children ages 6 to 11.

11.3 : To prevent inappropriate weight gain in adolescents ages 12 to 19 years.

11.4 : To prevent inappropriate weight gain in children and adolescents aged 2 to 19 years.

11.5 To prevent inappropriate weight gain in adults aged 20 years and older.

Healthy People 2020 Nutrition and Weight Status Objectives 14–18 concentrate on food and nutrition consumption, which focus on increasing the contribution of fruits and vegetables to the diets of the population ages 2 years and older and reducing the consumption of saturated fats and calories from solid fats and added sugars in the population ages 2 years and older (Healthypeople.gov, 2015b).

Objective NWS 14: To increase the contribution of fruits to the diets of the population ages 2 years and older.

Objective NWS 15: To increase the variety and contribution of vegetables to the diets of the population ages 2 years and older. (Contains 2 sub-objectives.)

15.1 to increase the contribution of total vegetables to the diets of the population ages 2 and older.

15.2 : To increase the contribution of dark green vegetables, orange vegetables, and legumes to the diets of the population ages 2 years and older.

Objective NWS 16 : To increase contribution of whole grains to the diets of the population ages 2 years and older.

Objective NWS 17 : To reduce consumption of calories for solid fats and added sugars in the population ages 2 years and older. (Contains three sub-objectives.)

17.1: To reduce consumption of calories from solid fats.

17.2 : To reduce consumption of calories from added sugars.

17.3 : To reduce consumption of calories from solid fats and added sugars.

Objective NWS 18 : To reduce consumption of saturated fat in the population ages 2 years and older.

Appendix B: Coalitions and Initiatives in Aurora, Illinois

**Coalition for Health and Wellness**

The Kane County Coalition for Health and Wellness is a volunteer collaborative organization focusing on improving the health of Kane County residents and providing community screening and referral services, assessments, education outreach programs, and policy advocacy. Among the organization's accomplishments, it created and maintains the Coalition Speakers Bureau, advocated for Smoke-Free Illinois in the state legislature, awarded a grant to enhance women's health education, produced health messages for placement in local buses, enhanced awareness of physical education programs within Kane County schools, produced a Wellness Campaign Booklet, offered a free Wellness Assessment tool for employees, created and maintains the Stall Street Journal, and offers a free prop lending library for education purposes (KCHD, 2012b, p. 20–21).

**Compañeros en Salud**

Established in 1999, Compañeros en Salud/Partners in Health is a grassroots coalition that assists members of the Hispanic community in accessing appropriate health care and social services. Since its inception, the organization has been influential in exploring the needs of and developing improved services for the Latino communities in Aurora. They have been instrumental in affecting health and related policies of major policymaking bodies such as the KCHD, the City of Aurora, and the major health and mental health care providers in the area. The proposed research study will illuminate the particular problems of obesity experienced by Hispanic families in the Aurora community and will further support the efforts of this coalition by leading to improved nutrition education programs tailored to Hispanic caregivers and families.

# Appendix C: List of Venues

Below are the venues that located in Aurora, Illinois, where Hispanic parent/child caregivers congregate.

## Community Organization

Latina Talk and Tea
Zaida Rodriguez, Community Relations & Outreach
2000 Ogden Avenue, Aurora, Illinois 60504
630-978-4989
Meeting location: Prisco Community Center, 150 West Illinois Avenue, Aurora, Illinois 60506

# Appendix D: Demographics Questionnaire

1. What is your gender?

☐ Male ☐ Female

2. Do you currently reside in Aurora Illinois?

☐ Yes ☐ No

3. What is zip code do you reside?

☐ 60502 ☐ 60503 ☐ 60504 ☐ 60505 ☐ 60506 ☐ 60507

☐ 60568 ☐ 60572 ☐ 60598 ☐ 60599 ☐ Other

4. What is your ethnicity?

☐ Hispanic / Latino / Spanish ☐ White / Caucasian

☐ Black /African American ☐ American Indian or Alaska Native

☐ Asian ☐ Native Hawaiian or other Pacific Islander

☐ Other (please specify) ____________________

5. Do you have members in your family who are children (less than 18 years of age) whom reside in your household; that makes you a parent / child caregiver?

☐ Yes ☐ No

6. Do you purchase the food for the family members in your household?

☐ Yes ☐ No

7. Do you plan and prepare the food for the family members in your household?

☐ Yes ☐ No

8. Where were you born?

☐ Mexico ☐ Central American ☐ South American

☐ United States ☐ Other

9. How long have you lived in Aurora, Illinois?

☐ Less than 6 months ☐ 6 months to 1 year ☐ 1-5 years

☐ 5-10 years ☐ Over 10 years

10. What is your age? _________

11. What is your current marital status?

☐ Single ☐ Married ☐ Living with partner

☐ Separated ☐ Divorced ☐ Widowed

☐ Living with partner/significant other

12. What is the highest level of education you have completed?

☐ Elementary School ☐ Some High School ☐ High School Diploma

☐ Some College ☐ Associate Degree ☐ Bachelor’s Degree

☐ Graduate Degree ☐ Terminal Degree

13. What is the combined / total yearly income of your household?

☐ Under $21,000 ☐ $21,000 - $30,999 ☐ $31,000 - $40,999

☐ $41,000 - $50,999 ☐ $51,000 - $75,999 ☐ $76,000 - $100,000

☐ Over $100,000

14. What is your height in inches or centimeters? _____inches or ______centimeters

15. What is your weight in pounds or kilograms? ______pounds or ______kilograms

**Demographics Questionnaire: Spanish Version**

1. ¿Cuál es su género?

☐ Hombre ☐ Mujer

2. ¿Vive usted actualmente en Aurora Illinois?

☐ Sí ☐ No

3. ¿Cuál es el código postal reside usted?

☐ 60502 ☐ 60503 ☐ 60504 ☐ 60505 ☐ 60506 ☐ 60507

☐ 60568 ☐ 60572 ☐ 60598 ☐ 60599 ☐ Otro

4. ¿Cuál es su origen étnico?

☐ Hispano / Latino / Español ☐ Blanco / Caucásico

☐ Negro / afroamericano ☐ Indio americano o nativo de Alaska

☐ Asiático ☐ Nativo de Hawai o de otra isla del Pacífico

☐ Otros (especificar) ___________________

5. ¿Tiene miembros de su familia que son niños (menores de 18 años de edad) quienes residen en su hogar?

☐ Sí ☐ No

6. ¿Compra la comida para los miembros de su familia viven en su casa?

☐ Sí ☐ No

7. ¿Tiene planes y preparar la comida para los miembros de su familia viven en su casa?

☐ Sí ☐ No

8. ¿Dónde naciste?

☐México ☐ Centroamericano ☐ Sudamericana

☐ Estados Unidos ☐ Otro

9. ¿Cuánto tiempo llevas viviendo en Aurora, Illinois?

☐ Menos de 6 meses ☐ 6 meses a 1 año ☐ 1-5 años

☐ 5 - 10 años ☐ Más de 10 años

10. ¿Cuál es su edad? _________

11. ¿Cuál es su estado civil actual?

☐ Soltero ☐ Casado ☐ viviendo en pareja

☐ Separado ☐ Divorciado ☐ Viudo ☐ Vivir con la pareja / pareja

12. ¿Cuál es el nivel educativo más alto que ha alcanzado?

☐ Escuela Primaria ☐ Some High School ☐ Diploma de Secundaria

☐ Algo de universidad ☐ Grado Asociado ☐Grado de Licenciatura

☐Postgrado ☐ Terminal Grado

13. ¿Cuál es la combinación / ingreso anual total de su hogar?

☐ Menos de $ 21,000 ☐ $ 21,000 - $ 30,999 ☐ $ 31000 - $ 40999

☐ $ 41,000 - $ 50,999 ☐ $ 51,000 - $ 75,999 ☐ $ 76,000 - $ 100.000

☐ Más de $ 100,000

14. ¿Cuál es su altura en pulgadas o centímetros? _____inches o ______centimeters

15. ¿Cuál es su peso en libras o kilogramos? ______pounds o ______kilograms

# Appendix E: Bidimensional Acculturation Scale

*The Bidimensional Acculturation Scale for Hispanics (BAS): English Version*

Select a number between 4 and 1 that best applies for each item.

*Language Use Subscale*

| | Almost always | Often | Sometimes | Almost never |
|---|---|---|---|---|
| 1. How often do you speak English? | 4 | 3 | 2 | 1 |
| 2. How often do you speak English with your friends? | 4 | 3 | 2 | 1 |
| 3. How often do you think in English? | 4 | 3 | 2 | 1 |
| 4. How often do you speak Spanish? | 4 | 3 | 2 | 1 |
| 5. How often do you speak in Spanish with your friends? | 4 | 3 | 2 | 1 |
| 6. How often do you think in Spanish? | 4 | 3 | 2 | 1 |

*Linguistic Proficiency Subscale*

| | Very well | Well | Poorly | Very poorly |
|---|---|---|---|---|
| 7. How well do you speak English? | 4 | 3 | 2 | 1 |
| 8. How well do you read in English? | 4 | 3 | 2 | 1 |

| | | | | |
|---|---|---|---|---|
| 9. How well do you understand television programs in English? | 4 | 3 | 2 | 1 |
| 10. How well do you understand radio programs in English? | 4 | 3 | 2 | 1 |
| 11. How well do you write in English? | 4 | 3 | 2 | 1 |
| 12. How well do you understand music in English? | 4 | 3 | 2 | 1 |
| 13. How well do you speak Spanish? | 4 | 3 | 2 | 1 |
| 14. How well do you read in Spanish? | 4 | 3 | 2 | 1 |
| 15. How well do you understand television programs in Spanish? | 4 | 3 | 2 | 1 |
| 16. How well do you understand radio programs in Spanish? | 4 | 3 | 2 | 1 |
| 17. How well do you write in Spanish? | 4 | 3 | 2 | 1 |
| 18. How well do you understand music in Spanish? | 4 | 3 | 2 | 1 |

*Electronic Media Subscale*

| | Almost always | Often | Sometimes | Almost never |
|---|---|---|---|---|
| 19. How often do you watch television programs in English? | 4 | 3 | 2 | 1 |

| | | | | |
|---|---|---|---|---|
| 20. How often do you listen to radio programs in English? | 4 | 3 | 2 | 1 |
| 21. How often do you listen to music in English? | 4 | 3 | 2 | 1 |
| 22. How often do you watch television programs in Spanish? | 4 | 3 | 2 | 1 |
| 23. How often do you listen to radio programs in Spanish? | 4 | 3 | 2 | 1 |
| 24. How often do you listen to music in Spanish? | 4 | 3 | 2 | 1 |

**The Bidirectional Acculturation Scale for Hispanics (BAS): Spanish version**

Seleccione un número entre 4 y 1 que mejor se aplica a cada elemento.

*Language Use Subscale*

| | Casi siempre | Frecuentemente | Algunas veces | Casi nunca |
|---|---|---|---|---|
| 1. ¿Con qué frecuencia habla usted inglés? | 4 | 3 | 2 | 1 |
| 2. ¿Con qué frecuencia habla usted inglés con sus amigos? | 4 | 3 | 2 | 1 |
| 3. ¿Con qué frecuencia piensa usted en inglés? | 4 | 3 | 2 | 1 |
| 4. ¿Con qué frecuencia habla usted español? | 4 | 3 | 2 | 1 |
| 5. ¿Con qué frecuencia habla usted en español con sus amigos ? | 4 | 3 | 2 | 1 |
| 6. ¿Con qué frecuencia piensa usted en español? | 4 | 3 | 2 | 1 |

*Linguistic Proficiency Subscale*

| | Muy bien | Bien | No muy bien | Muy mal |
|---|---|---|---|---|
| 7. ¿Qué tan bien habla usted inglés? | 4 | 3 | 2 | 1 |
| 8. ¿Qué tan bien lee usted en inglés? | 4 | 3 | 2 | 1 |
| 9. ¿Qué tan bien entiende usted los programas de televisión en inglés? | 4 | 3 | 2 | 1 |
| 10. ¿Qué tan bien entiende usted los programas de radio en inglés? | 4 | 3 | 2 | 1 |
| 11. ¿Qué tan bien escribe usted en inglés? | 4 | 3 | 2 | 1 |
| 12. ¿Qué tan bien entiende usted música en inglés? | 4 | 3 | 2 | 1 |
| 13. ¿Qué tan bien habla usted español? | 4 | 3 | 2 | 1 |
| 14. ¿Qué tan bien lee usted en español? | 4 | 3 | 2 | 1 |
| 15. ¿Qué tan bien entiende usted los programas de televisión en español? | 4 | 3 | 2 | 1 |
| 16. ¿Qué tan bien entiende usted los programas de radio en español? | 4 | 3 | 2 | 1 |
| 17. ¿Qué tan bien escribe usted en español? | 4 | 3 | 2 | 1 |
| 18. ¿Qué tan bien entiende usted música en español? | 4 | 3 | 2 | 1 |

*Electronic Media Subscale*

| | Casi siempre | Frecuentemente | Algunas veces | Casi nunca |
|---|---|---|---|---|
| 19. ¿Con qué frecuencia ve usted programas de televisión en inglés? | 4 | 3 | 2 | 1 |
| 20. ¿Con qué frecuencia escucha usted programas de radio en inglés? | 4 | 3 | 2 | 1 |
| 21. ¿Con qué frecuencia escucha usted música en inglés? | 4 | 3 | 2 | 1 |
| 22. ¿Con qué frecuencia ve usted programas de televisión en español? | 4 | 3 | 2 | 1 |
| 23. ¿Con qué frecuencia escucha usted programas de radio en español? | 4 | 3 | 2 | 1 |
| 24.¿Con qué frecuencia escucha usted música en español? | 4 | 3 | 2 | 1 |

From "A new measurement of acculturation for Hispanics: The Bidimensional Acculturation Scale for Hispanics (BAS), " G. Marin, and R. J. Gamba, 1996, *Hispanic Journal of Behavioral Science* p. 311-312. No permission from author required p.312.

Appendix F: Block "Alive" Screener/BFSFVS

**Block Dietary Data Systems**
www.nutritionquest.com

## Block Fat-Sugar-Fruit-Vegetable-Glycemic Load Screener ©

Today's Date: ________________

Think about your eating habits over the past year. About how often do you eat each of the following foods? Remember breakfast, lunch, dinner, snacks and eating out. Mark 2 responses for each food:

- "**How Many Days per Week**" you usually eat the food, and
- "**How Much**" of the food you usually eat.

For some of the foods, please tell us

- "**What type**" of the food you usually eat.

| | Usual Eating Habits | How Many Days per Week | | | | | | How Much on Those Days? | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | None or less than 1 | 1 day | 2 days | 3-4 days | 5-6 days | Every day | | | |
| 1 | Glasses of milk, not counting on cereal or coffee (any kind) | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 glass | ❍ 2 | ❍ 3 + |
| | **What kind of milk do you usually drink?**<br>❍ Whole milk<br>❍ Reduced fat-2%<br>❍ Low-fat 1%<br>❍ Skim milk<br>❍ Soy milk<br>❍ Rice milk<br>❍ I don't drink milk or soy milk | | | | | | | | | |
| 2 | Real 100% fruit juice, like orange juice, apple juice, or fruit smoothies. Don't count soft drinks or drinks like Sunny Delight | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ Small 6-oz glass | ❍ 1 cup | ❍ 2+ cups |
| 3 | Vegetable juice, like tomato juice, V8, carrot | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ Small 6-oz glass | ❍ 1 cup | ❍ 2+ cups |

| | Usual Eating Habits | How Many Days per Week: None or less than 1 | 1 day | 2 days | 3-4 days | 5-6 days | Every day | How Much on Those Days? | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Snapple, Kool-Aid, instant lemonade, instant ice tea, regular or sugar-free | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 glass | ❍ 2 | ❍ 3 + |
| | **If you drink Snapple, Kool-Aid, instant ice tea or instant lemonade, is it usually:** ❍ Sugar-free ❍ Regular ❍ I don't drink these | | | | | | | | | |
| 5 | Drinks with some juice, like Hawaiian Punch, Sunny Delight, Knudsen, Hi-C, Cranberry Juice Cocktail | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 glass | ❍ 2 | ❍ 3 + |
| 6 | Any kind of soft drink, soda or pop, like cola, Sprite, orange soda, regular or sugar-free | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 glass/can | ❍ 2 | ❍ 3 + |
| | **If you drink soft drinks or pop, is it usually:** ❍ Diet or sugar free pop ❍ Regular ❍ I don't drink pop | | | | | | | | | |
| 7 | Beer | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 glass/can | ❍ 2 | ❍ 3 + |
| 8 | Eggs, or breakfast sandwiches with eggs, like Egg McMuffins | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 egg | ❍ 2 | ❍ 3 + |
| 9 | Cold cereal, any kind | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ small bowl | ❍ medium bowl | ❍ large bowl |
| 10 | Cooked cereal like oatmeal, grits or cream of wheat | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ small bowl | ❍ medium bowl | ❍ large bowl |

| | Usual Eating Habits | None or less than 1 | 1 day | 2 days | 3-4 days | 5-6 days | Every day | How Much on Those Days? | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **How Many Days per Week** | | | | | | | | |

**What kind of cereal do you usually eat?**

**Choose one or two that you eat most often.** (If you usually just eat one kind, just choose one.)

- O Low-carb cereals like Atkins, Low-Carb Special K
- O Cheerios (plain), Shredded Wheat, Wheaties, Wheat Chex, oatmeal, cream of wheat
- O Sweetened cereals like Frosted Flakes, Honey Nut Cheerios, Fruit Loops, Cap'n Crunch, granola, instant sweetened oatmeal
- O Other cold cereals, like Corn Flakes, Rice Krispies, Bran Flakes
- O I don't eat cereal

| | Usual Eating Habits | None or less than 1 | 1 day | 2 days | 3-4 days | 5-6 days | Every day | How Much on Those Days? | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Real sugar or honey in coffee or tea or on cereal | O | O | O | O | O | O | O 1 tsp | O 2 | O 3 + |
| 12 | Cheese, sliced cheese or cheese spread, including on sandwiches | O | O | O | O | O | O | O 1 slice | O 2 | O 3+ |
| 13 | Lunchmeats like bologna, sliced ham, turkey lunchmeat, or any other cold cuts | O | O | O | O | O | O | O 1 slice | O 2 | O 3+ |

**If you eat lunch meats, are they usually:**

- O Low Fat or turkey
- O Regular
- O I don't eat lunch meats

| | Usual Eating Habits | None or less than 1 | 1 day | 2 days | 3-4 days | 5-6 days | Every day | How Much on Those Days? | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Hamburgers, cheeseburgers, meatballs or meat loaf | O | O | O | O | O | O | O 3 oz 1 small | O 1 large | O 2 large |
| 15 | Hot dogs, or sausage like Polish, Italian or chorizo | O | O | O | O | O | O | O 1 hotdog | O 2 | O 3+ |

**If you eat hot dogs, are they usually:**

- O Low Fat or turkey dogs
- O Regular hot dogs
- O I don't eat hot dogs

| | Usual Eating Habits | None or less than 1 | 1 day | 2 days | 3-4 days | 5-6 days | Every day | How Much on Those Days? | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 16 | Other beef or pork, such as steak, roast beef, ribs, or in sandwiches, tacos, burritos | O | O | O | O | O | O | O 3 oz small | O 4-6 oz | O 7 + oz large |

| | Usual Eating Habits | How Many Days per Week: None or less than 1 | 1 day | 2 days | 3-4 days | 5-6 days | Every day | How Much on Those Days? | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Fried chicken, including chicken nuggets, wings, chicken patty | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 piece | ❍ 2 pieces, 6 nuggets | ❍ 3 |
| 18 | Fish, any kind | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 2 ounces | ❍ 4 ounces | ❍ 6 ounces |
| 19 | Pizza | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 slice | ❍ 2 | ❍ 3+ |
| 20 | Spaghetti, lasagna, other pasta, or noodles | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 cup | ❍ 2 | ❍ 3+ |
| 21 | Rice, or dishes made with rice | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 cup rice | ❍ 2 | ❍ 3+ |
| 22 | Green salad and vegetables you put in green salad | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 cup | ❍ 2 | ❍ 3+ |
| 23 | Any kind of fruit, fresh or canned (not counting juice) | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 fruit or ½ cup | ❍ 2 fruits or 1 cup | ❍ 3 fruits or 2 cups |
| 24 | French-fries, home fries, hash browns | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ McD Small | ❍ medium | ❍ Large |
| 25 | Potatoes not fried, like baked, mashed | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ ½ cup or ½ potato | ❍ 1 | ❍ 2+ |
| 26 | Vegetable soup, or stew with vegetables | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 cup | ❍ 1 ½ | ❍ 2+ |
| 27 | ALL other vegetables you eat, as a side dish or in any kind of dish, not counting salad or potatoes | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ ½ cup altogether | ❍ 1 | ❍ 2 + |

| | Usual Eating Habits | How Many Days per Week | | | | | | How Much on Those Days? | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | None or less than 1 | 1 day | 2 days | 3-4 days | 5-6 days | Every day | | | |
| 28 | Bread, rolls, bagels | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 slice | ❍ 2 | ❍ 3 + |
| | **What kind of bread do you usually eat?**<br>❍ Italian, French or local bakery<br>❍ Regular sliced white bread<br>❍ Dark bread like rye, cracked wheat<br>❍ 100% whole wheat<br>❍ I don't know or I don't eat bread | | | | | | | | | |
| 29 | Biscuits, muffins, croissants | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 | ❍ 2 | ❍ 3 + |
| 30 | Snack chips like potato chips, tortilla chips, Fritos, Doritos, popcorn (not pretzels) | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 small handful | ❍ 1 oz bag (1 cup) | ❍ Big bag (2 cup) |
| | **If you eat snacks like chips, are they usually:**<br>❍ Trans-fat free<br>❍ Regular<br>❍ I don't know<br>❍ I don't eat them | | | | | | | | | |
| 31 | Crackers, like soda crackers, Cheez-Its, or any other snack cracker | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 3-4 small crackers | ❍ 5-10 crackers | ❍ a lot |
| | **If you eat crackers, are they usually:**<br>❍ Trans-fat free<br>❍ Triscuits, Graham crackers, Ry-Vita<br>❍ Saltines, other snack crackers<br>❍ I don't eat them | | | | | | | | | |

| | Usual Eating Habits | How Many Days per Week: None or less then 1 | 1 day | 2 days | 3-4 days | 5-6 days | Every day | How Much on Those Days? | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 32 | Ice cream, ice cream bars | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ ½ cup | ❍ 1 | ❍ 2 + |
| | **If you eat ice cream, is it usually:**<br>❍ Low carb, low sugar<br>❍ Low fat or ice milk<br>❍ Regular<br>❍ Premium<br>❍ I don't eat it | | | | | | | | | |
| 33 | Doughnuts | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 | ❍ 2 | ❍ 3+ |
| 34 | Cake, cookies, or snack cakes like cupcakes, Twinkies, or any other pastry | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 small piece | ❍ 1 medium | ❍ 2 + |
| | **If you eat cake, snack cakes, cookies and other pastries, are they usually:**<br>❍ Low carb, low sugar<br>❍ Low fat<br>❍ Regular<br>❍ I don't eat it | | | | | | | | | |
| 35 | Pie including fast food pies or snack pies | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 small piece | ❍ 1 medium | ❍ 2 + |
| 36 | Chocolate candy like chocolate bars, M&Ms, Reeses | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 mini | ❍ 1 medium | ❍ 1 large |
| | **If you eat chocolate candy, is it usually:**<br>❍ Low carb, low sugar<br>❍ Low fat<br>❍ Regular<br>❍ I don't eat it | | | | | | | | | |

| | Usual Eating Habits | How Many Days per Week: None or less than 1 | 1 day | 2 days | 3-4 days | 5-6 days | Every day | How Much on Those Days? | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 37 | Any other candy, not chocolate, like hard candy, Lifesavers, Skittles, Starburst | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1-2 pieces | ❍ ½ package | ❍ 1 package |
| | **If you eat other candy, not chocolate, is it usually:**<br>❍ Sugar-free<br>❍ Regular<br>❍ I don't eat it | | | | | | | | | |
| 38 | Margarine (not butter) on bread or on vegetables | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 teaspoon | ❍ 2 teaspoons | ❍ 3 teaspoons |
| | **When you use margarine, is it usually:**<br>❍ Stick margarine<br>❍ Soft tub margarine<br>❍ Low-fat margarine<br>❍ Butter-margarine blend<br>❍ Non-hydrogenated and trans-fat free<br>❍ I don't eat it | | | | | | | | | |
| 39 | Butter (not margarine) on bread or on vegetables | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ 1 teaspoon | ❍ 2 teaspoons | ❍ 3 teaspoons |
| 40 | Fat or oil in cooking | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | | | |
| | **What kind of fat or oil do you usually use in cooking?**<br>CHECK ONLY 1 or 2.<br>❍ Pam, or no oil<br>❍ Butter<br>❍ Butter/margarine blend<br>❍ Stick margarine<br>❍ Soft tub margarine<br>❍ Low-fat margarine<br>❍ Corn oil, vegetable oil<br>❍ Olive oil, canola oil<br>❍ Lard, fatback, bacon fat<br>❍ Crisco<br>❍ Trans-fat free brand<br>❍ I don't know, or don't cook | | | | | | | | | |

**Thank you very much for filling out this questionnaire!**
Please take a minute to go back and fill in anything you may have skipped.





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## Block "Alive" Screener/BFSFVS- Spanish Version

# Block Dietary Data Systems

www.nutriontionquest.com

### Block Fat-Sugar-Fruit-Vegetable-Glycemic Load Screener – SPANISH ©

Fecha de hoy: _______________________

Piense en sus hábitos de comida durante este último año. Piense cuan a menudo usted come las siguientes comidas. Acuérdese del desayuno, almuerzo, cena, meriendas y comidas consumidas fuera de su casa (en un restaurante). Por cada una de estas comidas, por favor dígame

- **"¿Cuántos Días a la Semana?"** usted usualmente come la comida, y
- **"¿Qué Cantidad?"**de esta comida usted usualmente come.

Para unas de las comidas, por favor dígame

- **"¿Qué tipo?"** consume usted usualmente.

| | Hábitos de Comida | ¿Cuántos Días a la Semana? Ningún o menos de 1 día | 1 día | 2 días | 3-4 días | 5-6 días | Todos los días | ¿Qué cantidad en esos Días? | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Vasos de leche, sin contar la que se le agrega al café o cereal (de cualquier tipo) | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántos vasos en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| | **¿Que tipo de leche usted usualmente toma?**<br>☐ Leche entera<br>☐ Leche baja en grasa al 2%<br>☐ Leche baja en grasa al 1%<br>☐ Leche descremada (skim milk)<br>☐ Leche de soya<br>☐ Leche de arroz<br>☐ No tomo leche ni leche de soya | | | | | | | | | | |
| 2 | 100% jugo de frutas, tales como el jugo de naranja, jugo de manzana, o licuado de frutas. Sin contar refrescos o bebidas tales como *Sunny Delight*. | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Qué cantidad en esos días? | ❍ vaso pequeño 6oz | ❍ 1 taza | ❍ 2 + taza |
| 3 | Jugo de vegetales, tales como el jugo de tomate, *V8*, zanahorias | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Qué cantidad en esos días? | ❍ vaso pequeño 6oz | ❍ 1 taza | ❍ 2 + tazas |

| | Hábitos de Comida | ¿Cuántos Días a la Semana? Ningún o menos de 1 día | 1 día | 2 días | 3-4 días | 5-6 días | Todos los días | ¿Qué cantidad en esos Días? | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | *Snapple, Koolaid*, limonada instantánea, té helado instantáneo, regular o sin azúcar | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántos vasos en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| | **Si usted toma *Snapple, KoolAid*, te instantáneo o limonada instantánea, usualmente son:** ☐ Sin azúcar ☐ Regulares ☐ No los tomo | | | | | | | | | | |
| 5 | Bebidas con un poco de jugo, como el *Hawaiian Punch, Sunny Delight, Knudsen, Hi-C, Cramberry Juice Cocktail* | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántos vasos en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| 6 | Cualquier tipo de refresco, como los de Cola, Sprite, soda de naranja, regular o sin azúcar | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántos vasos o latas en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| | **Si usted toma refrescos o gaseosas, usualmente son:** ☐ Refrescos o gaseosas de dieta o sin azúcar ☐ Regulares ☐ No tomo refrescos o gaseosas | | | | | | | | | | |
| 7 | Cerveza o cerveza sin alcohol | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántos vasos o latas en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| 8 | Huevos, o sándwiches o burritos para el desayuno con huevos, como *Egg McMuffins* | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántos huevos en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| 9 | Cereal frío, de cualquier tipo | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántos tazones en esos días? | ❍ 1 pequeño | ❍ 1 mediano | ❍ 1 grande |
| 10 | Cerealesl calientes como avena, sémola de maíz (*grits*), o crema de trigo | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántos tazones en esos días? | ❍ 1 pequeño | ❍ 1 mediano | ❍ 1 grande |

| | Hábitos de Comida | Ningún o menos de 1 día | 1 día | 2 días | 3-4 días | 5-6 días | Todos los días | ¿Qué cantidad en esos Días? | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|

**¿Que tipo de cereal usted usualmente come?**

Escoja 1 o 2 que usted come más a menudo. (Si usualmente usted solo come uno, entonces marque uno.)

- ☐ Cereales bajos en carbohidratos como *Atkins, Low-Carb Special K*
- ☐ *Cheerios* (simple), *Shredded Wheat, Wheaties, Wheat Chex*, avena, crema de trigo (farina)
- ☐ Cereales con azúcar como el *Frosted Flakes, Honey Nut Cheerios, Fruit Loops, Cap'n Crunch*, de granola, o avena instantánea con azúcar
- ☐ Otros cereales como el *Corn Flakes, Rice Krispies, Bran Flakes*
- ☐ No como cereal

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 11 | Azúcar real o miel en el café o té o en el cereal o en la avena | ○ | ○ | ○ | ○ | ○ | ○ | ¿Cuántas cucharaditas en esos días? | ○ 1 | ○ 2 | ○ 3 + |
| 12 | Queso, queso rebanado, o queso para untar, incluyendo el que usa en sándwiches | ○ | ○ | ○ | ○ | ○ | ○ | ¿Cuántas rebanadas en esos días? | ○ 1 | ○ 2 | ○ 3 + |
| 13 | Fiambres/embutidos como la mortadela, jamón en rebanadas, mortadela de pavo, o cualquier otro tipo de fiambre/embutido | ○ | ○ | ○ | ○ | ○ | ○ | ¿Cuántas rebanadas en esos días? | ○ 1 | ○ 2 | ○ 3 + |

**Si usted come fiambres o embutidos, usualmente son:**

- ☐ Bajos en grasa o de pavo
- ☐ Regulares
- ☐ No como fiambres o embutidos

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Hamburguesas, hamburguesas con queso, albóndigas, o *meat loaf* | ○ | ○ | ○ | ○ | ○ | ○ | ¿Qué cantidad en esos días? | ○ 3 oz, 1 pequeño | ○ 1 grande | ○ 2 grande |
| 15 | *Hot dogs*, salchicha polaca, salchicha italiana o chorizo | ○ | ○ | ○ | ○ | ○ | ○ | ¿Cuántos *hot dogs?* | ○ 1 | ○ 2 | ○ 3 + |

**Si come *hot dogs*, usualmente son:**

- ☐ Bajos en grasa o de pavo
- ☐ *Hot dogs* regulares
- ☐ No como *hot dogs*

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 16 | Otra carne de res o de cerdo, como el bistec, rosbif, costillitas, o en sándwiches, tacos o burritos | ○ | ○ | ○ | ○ | ○ | ○ | ¿Qué cantidad en esos días? | ○ 3 oz pequeño | ○ 4-6 oz | ○ 7 + oz grande |

| | Hábitos de Comida | ¿Cuántos Días a la Semana? Ningún o menos de 1 día | 1 día | 2 días | 3-4 días | 5-6 días | Todos los días | ¿Qué cantidad en esos Días? | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | Pollo frito, incluyendo *nuggets*, alitas y hamburguesas de pollo | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas *piezas medias?* | ❍ 1 | ❍ 2 pzas 6 nuggets | ❍ 3 |
| 18 | Pescado, de cualquier tipo | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Qué cantidad en esos días? | ❍ 2 onzas | ❍ 4 onzas | ❍ 6 onzas |
| 19 | Pizza | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas rebanadas en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| 20 | Espagueti, lasaña, u otra pasta con salsa de tomate | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas tazas en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| 21 | Arroz o platos preparados con arroz | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas tazas de arroz en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| 22 | Ensalada verde y vegetales que se agregan a la ensalada | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas tazas en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| 23 | Cualquier tipo de frutas, fresca o enlatadas (sin contar jugo) | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Qué cantidad en esos días? | ❍ 1 fruta ó ½ taza | ❍ 2 frutas ó 1 taza | ❍ 3 frutas ó 2 tazas |
| 24 | Papas a la francesa, papitas fritas, *hash browns* | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Qué cantidad en esos días? | ❍ pequeño McD | ❍ mediano | ❍ grande |
| 25 | Papas no fritas, como la papa horneada y majadas (puré de papas) | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Qué cantidad en esos días? | ❍ 1/2 taza ó 1/2 papa | ❍ 1 | ❍ 2 + |
| 26 | Sopa de vegetales o guisado con vegetales | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas tazas en esos días? | ❍ 1 | ❍ 1 1/2 | ❍ 3 + |
| 27 | TODOS los demás vegetales que usted come, servido al lado o en cualquier tipo de plato, sin contar ensaladas o papas | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas tazas en total en esos días? | ❍ 1/2 | ❍ 1 | ❍ 2 + |

| | Hábitos de Comida | ¿Cuántos Días a la Semana? Ningún o menos de 1 día | 1 día | 2 días | 3-4 días | 5-6 días | Todos los días | ¿Qué cantidad en esos Días? | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 28 | Panes, bollos, panecillos, *bagels* | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas rebanadas en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |

¿Qué tipo de pan, usted usualmente come?

- ☐ Italiano, Francés o de una repostería local
- ☐ Pan regular blanco rebanado
- ☐ Pan negro como el pan de centeno (*rye*) y pan agrietado del trigo
- ☐ 100% pan integral
- ☐ No sé o no como pan

| | Hábitos de Comida | Ningún o menos de 1 día | 1 día | 2 días | 3-4 días | 5-6 días | Todos los días | ¿Qué cantidad en esos Días? | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 29 | Bisquet, molletes (*muffins*), *croissants* | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Qué cantidad en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| 30 | Aperitivos (*snacks*) tales como papitas, chips de tortilla, Fritos, Doritos, palomitas de maíz (no pretzels) | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Qué cantidad en esos días? | ❍ 1 puñado pequeño | ❍ bolsa de 1 oz (1 taza) | ❍ bolsa grande (2 tazas) |

**Si usted come aperitivos (*snacks*) como las papitas, usualmente son:**

- ☐ Sin ásido graso trans (*Trans-fat free*)
- ☐ Regulares
- ☐ No sé
- ☐ No las como

| | Hábitos de Comida | Ningún o menos de 1 día | 1 día | 2 días | 3-4 días | 5-6 días | Todos los días | ¿Qué cantidad en esos Días? | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | Galletas, tales como galletas de soda, *Cheez-Its*, o cualquier otro tipo de galleta de aperitivo | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas galletas en esos días? | ❍ 3-4 pequeño | ❍ 5-10 | ❍ muchas |

**Si usted come galletas, usualmente son:**

- ☐ Sin ásido graso trans (*Trans-fat free*)
- ☐ *Triscuits*, galletas *Graham*, *Ry-Vita*
- ☐ *Saltines*, u otro tipo de galleta
- ☐ No las como

| | Hábitos de Comida | ¿Cuántos Días a la Semana? Ningún o menos de 1 día | 1 día | 2 días | 3-4 días | 5-6 días | Todos los días | ¿Qué cantidad en esos Días? | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 32 | Helado, barras de helado | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas tazas en esos días? | ❍ 1/2 | ❍ 1 | ❍ 2 + |
| | **Si usted come helado, usualmente son:** ☐ Bajos en carbohidratos, bajos en azúcar ☐ Bajos en grasa o leche helada ☐ Regulares ☐ *Premium* ☐ No los como | | | | | | | | | | |
| 33 | Dónut | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Qué cantidad en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| 34 | Pasteles, pan dulce, galletitas o pastelillos tipo aperitivo como los horneados en moldes (*cupcakes*), *Twinkies*, o cualquier otro tipo de pastél | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántos pedazos en esos días? | ❍ 1 pequeño | ❍ 1 mediano | ❍ 2 + |
| | **Si usted come pasteles, pan dulce, bocadillos de pastel, galletas, y otro tipo de pastél, usualmente son:** ☐ Bajos en carbohidratos, bajos en azúcar ☐ Bajos en grasa ☐ Regulares ☐ No los como | | | | | | | | | | |
| 35 | Tarta (pie) incluyendo tartas de comida rápida o tartas de entremés (snak) | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántos pedazos en esos días? | ❍ 1 pequeño | ❍ 1 mediano | ❍ 2 + |
| 36 | Dulce de chocolate como las barras de chocolate, *M&M*, *Reeses* | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Qué cantidad en esos días? | ❍ 1 mini | ❍ 1 mediano | ❍ 1 grande |
| | **Si usted come dulce de chocolate, usualmente son:** ☐ Bajos en carbohidratos, bajos en azúcar ☐ Bajos en grasa ☐ Regulares ☐ No los como | | | | | | | | | | |

| | Hábitos de Comida | Ningún o menos de 1 día | 1 día | 2 días | 3-4 días | 5-6 días | Todos los días | ¿Qué cantidad en esos Días? | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ¿Cuántos Días a la Semana? | | | | | | | | | |
| 37 | Cualquier otro tipo de dulce, no chocolate, como las barras de caramelo, *Lifesavers, Skittles, Starburst* | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Qué cantidad en esos días? | ❍ 1-2 pedazos | ❍ ½ paquete | ❍ 1 paquete |

**Si usted come otro tipo de dulce, que no sea chocolate, usualmente son:**

- ☐ Sin azúcar
- ☐ Regulares
- ☐ No los como

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 38 | Margarina (no mantequilla) en pan o verduras o vegetales | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas cucharaditas en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |

**Cuando usted usa margarina, usualmente es:**

- ☐ Margarina en barra
- ☐ Margarina suave
- ☐ Margarina baja en grasa
- ☐ Combinación de margarina y mantequilla
- ☐ Sin hidrogenación y asido graso trans (*Non-hydrogenated and trans-fat free*)
- ☐ No la como

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | Mantequilla (no margarina) en pan o verduras o vegetales | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | ¿Cuántas cucharaditas en esos días? | ❍ 1 | ❍ 2 | ❍ 3 + |
| 40 | Grasa o aceite al cocinar | ❍ | ❍ | ❍ | ❍ | ❍ | ❍ | | | | |

**¿Qué tipo de grasa o aceite, usted usualmente usa para cocinar?**

SOLO MARQUE 1 ó 2 RESPUESTAS.

- ☐ Pam o no usa aceite
- ☐ Mantequilla
- ☐ Combinación de mantequilla y margarina
- ☐ Margarina de barra
- ☐ Margarina suave
- ☐ Margarina baja en grasa
- ☐ Aceite de maíz, aceite vegetal
- ☐ Aceite de oliva, aceite de canola
- ☐ Manteca, grasa de animal, grasa de tocino
- ☐ *Crisco*
- ☐ Marca sin ásido graso trans (*Trans-fat free brand*)
- ☐ No sé, no cocino

**Muchas gracias por contestar este cuestionario.**
Por favor, tóme un minuto para revesarlo y contestar cualquier pregunta que se haya saltado.





From Block Dietary Data Systems, 15 Shattuck Square, Suite 288, Berkeley, CA 94704 Reprinted with permission.

Appendix G: Recruitment Flier


WHY: To explore the relationship between the acculturation and eating habits among Hispanic parents/child caregivers who reside in Aurora, Illinois to decrease and / or eliminate obesity and develop Hispanic family obesity treatment interventions and programs.

WHAT: A paper-based survey that explores factors that may influence obesity in Hispanic parents/child care givers. To take part in the survey research, you must: (1) be 18 years of age and older, (2) live in Aurora Illinois (3) identify yourself as Hispanic, (4) identify yourself as a parent and/or child caregiver and (4) be able to read, write, and understand English or Spanish.

HOW: Persons that agree to be in the survey research will be offered a private place to take the survey. People WILL NOT need to put their name on the survey. It will take about 20-30 minutes to complete the survey. The risks to take part in the study are minor. People can stop taking the survey at any time.

Those who complete the survey will receive a $5 Wal-Mart gift card.

WHERE: Surveys can be filled out on 00/00/0000 at the Prisco Center Community Center, 150 W. Illinois Ave. Aurora, Illinois 60506 from 00 a.m./p.m.
until 00 a.m./p.m.

WHO: If you are interested in learning about the results of the study, you can obtain the results by contacting the person leading this research:

Deanna Collins Sommers, MSN, RN, CPNP-PC
Doctoral Student, College of Health Sciences
Walden University Deanna.sommers@waldenu.edu or (630) 788-6759

Spanish: Recruitment Flier


Completa la Encusta de Illinois Aurora!

POR QUE: Para explorar la relación entre los hábitos alimentarios y de aculturación entre los hispanos padres/cuidadores de niños que residen en Aurora, Illinois, para disminuir y / o eliminar la obesidad y el desarrollo de obesidad familiar intervenciones y programas de tratamiento hispanos.

QUE: Una encuesta en papel que explora los factores que pueden influir en la obesidad en los padres hispanos/cuidadores de niños. Para tomar parte en la investigación de la encuesta, usted debe: (1) tener 18 años de edad o más, (2) viven en Aurora Illinois (3) identificarse como hispanos, (4) identificarse como uno de los padres y / o cuidadores del niño y (4) ser capaz de leer, escribir y entender Inglés o Español.

CÓMO: Las personas que estén de acuerdo en estar en la investigación de la encuesta se les ofrecerá un lugar privado para participar en la encuesta. La gente no tendrá que poner su nombre en la encuesta. Se tarda unos 20-30 minutos para completar la encuesta. Los riesgos a participar en el estudio son de menor importancia. Las personas pueden dejar de tomar la encuesta en cualquier momento.

Aquellos que completen la encuesta recibirán una tarjeta de regalo de $ 5 Wal-Mart.

DONDE: Las encuestas pueden ser llenados en 00/00/0000 en el Centro Prisco Community Center, 150 W. Illinois Ave. Aurora, Illinois 60506 de 00 a.m. / pm. hasta 00 a.m. / p.m.

QUIEN: Si usted está interesado en aprender acerca de los resultados del estudio, puede obtener los resultados por ponerse en contacto con la persona que dirige esta investigación:

Deanna Collins Sommers, MSN, RN, CPNP-PC

Estudiante de Doctorado de la Facultad de Ciencias de la Salud Walden Universidad

Deanna.sommers@waldenu.edu o (630) 788-6759

# Appendix H: Demographic Frequency Distributions

*Gender distribution*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Male | 51 | 30.9 | 30.9 | 30.9 |
| | Female | 114 | 69.1 | 69.1 | 100.0 |
| | Total | 165 | 100.0 | 100.0 | |

*Food purchaser distribution*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | yes | 135 | 81.8 | 81.8 | 81.8 |
| | no | 30 | 18.2 | 18.2 | 100.0 |
| | Total | 165 | 100.0 | 100.0 | |

*Food preparer/planner distribution*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | yes | 123 | 74.5 | 74.5 | 74.5 |
| | no | 42 | 25.5 | 25.5 | 100.0 |
| | Total | 165 | 100.0 | 100.0 | |

*Length of residency in Aurora*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | less than 6 months | 3 | 1.8 | 1.8 | 1.8 |
| | 6 months to 1 year | 7 | 4.2 | 4.2 | 6.1 |
| | 1-5 years | 15 | 9.1 | 9.1 | 15.2 |
| | 5-10 years | 29 | 17.6 | 17.6 | 32.7 |
| | over 10 years | 111 | 67.3 | 67.3 | 100.0 |
| | Total | 165 | 100.0 | 100.0 | |

*Marital status distribution*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Single | 37 | 22.4 | 22.4 | 22.4 |
| | married | 110 | 66.7 | 66.7 | 89.1 |
| | living with partner | 7 | 4.2 | 4.2 | 93.3 |
| | separated | 5 | 3.0 | 3.0 | 96.4 |
| | divorced | 2 | 1.2 | 1.2 | 97.6 |
| | living with partner/ significant other | 4 | 2.4 | 2.4 | 100.0 |
| | Total | 165 | 100.0 | 100.0 | |

*Birth location*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Mexico | 106 | 64.2 | 64.2 | 64.2 |
| | Central America | 6 | 3.6 | 3.6 | 67.9 |
| | South America | 3 | 1.8 | 1.8 | 69.7 |
| | United States | 48 | 29.1 | 29.1 | 98.8 |
| | Other | 2 | 1.2 | 1.2 | 100.0 |
| | Total | 165 | 100.0 | 100.0 | |

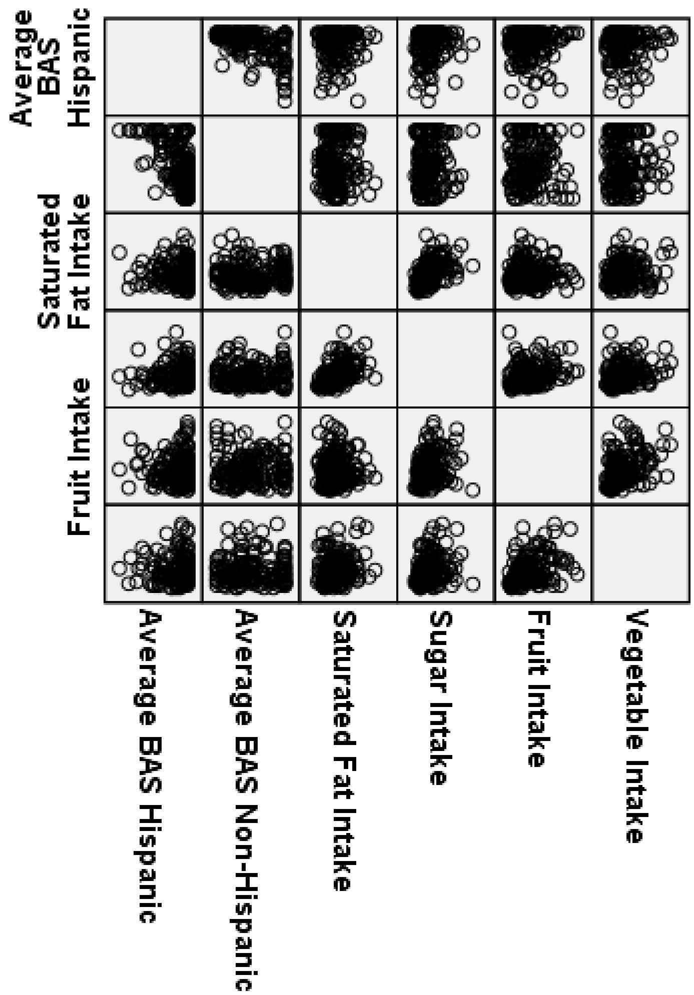
*Total annual income distribution*

| Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|
| 35 | 21.2 | 21.2 | 21.2 |
| 38 | 23.0 | 23.0 | 44.2 |
| 30 | 18.2 | 18.2 | 62.4 |
| 15 | 9.1 | 9.1 | 71.5 |
| 27 | 16.4 | 16.4 | 87.9 |
| 18 | 10.9 | 10.9 | 98.8 |
| 2 | 1.2 | 1.2 | 100.0 |
| 165 | 100.0 | 100.0 | |

*Distribution of obesity classifications*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | yes | 47 | 28.5 | 28.5 | 28.5 |
| | no | 118 | 71.5 | 71.5 | 100.0 |
| | Total | 165 | 100.0 | 100.0 | |

Appendix I: Scatterplot Matrix



Appendix J: Permission of Screener from NutrionQuest

**Berkeley Analytics, Inc.**
**dba NutritionQuest**
15 Shattuck Square, Suite 288
Berkeley, CA 94704-1151
Phone 510-704-8514 / Fax 510-704-8996
www.NutritionQuest.com

October 26, 2015

To whom it may concern:

Deanna Sommers, doctoral student at Walden University, has permission to include the text of the Block “Alive” (Fat-Sugar-Fruit-Vegetable) Food Screener © in her dissertation, entitled “Socioecological Determinants of Obesity among Hispanic Parents/Child Caregivers in Aurora, Illinois .” The implied agreement in her use of this questionnaire is that it contains information that is confidential and proprietary in nature, and which is protected by copyrights held by NutritionQuest. She is to retain the copyright notice on all pages of the Screener. NutritionQuest retains title. She is to use all reasonable efforts to protect the Screener from unauthorized use, reproduction, distribution or publication.

Sincerely,

Gladys Block, Ph.D.
Professor Emerita, University of California, Berkeley
http://sph.berkeley.edu/faculty/block.php
gblock@berkeley.edu

Scientific Director, NutritionQuest -- http://www.nutritionquest.com