

THE RELATIONSHIP BETWEEN ACCULTURATION, PERCEIVED
NEIGHBORHOOD DISORDER, PERCEIVED STRESS, AND FAMILISM ON
OBESITY AMONG HISPANIC ADOLESCENT FEMALES

by

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ABSTRACT OF THE DISSERTATION

The Relationship between Acculturation, Perceived Neighborhood Disorder, Perceived Stress, and Familism on Obesity among Hispanic Adolescent Females.

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The purpose of this study was to examine the relationship between the independent variables of acculturation, perceived neighborhood disorder, perceived stress, and familism on obesity (waist circumference (WC) and BMI percentile) among adolescent Hispanic females. Additionally, the study tested the relationships between acculturation and perceived stress, and perceived neighborhood disorder and perceived stress. The study also tested the variable familism as a mediator between acculturation and obesity and familism as a moderator between the relationship of perceived neighborhood disorder and obesity.

The final convenience sample of 169 senior high school students, aged 14-19 years, was recruited from an urban senior high school in Central, New Jersey. Participants completed a demographic data sheet and four instruments measuring the independent variables. BMI percentile and WC measured obesity.

The results indicated that perceived neighborhood disorder ($r = .15, p = .03$) was positively related to BMI percentile for age and sex. Also, acculturation ($r = .39, p < .01$) and perceived neighborhood disorder ($r = .13, p = .05$) were positively related to

perceived stress. However, multiple regression analysis showed that the mediation model between perceived neighborhood disorder, familism (mediator), and obesity (WC and BMI percentile) was not supported. Similarly, the regression equation with familism as a moderator between perceived neighborhood disorder and obesity was not supported. Finally, the relationships between acculturation and waist circumference, acculturation and body mass index percentile, acculturation and familism, waist circumference and perceived neighborhood disorder, waist circumference and perceived stress, familism and waist circumference and between familism and BMI percentile were not statistically significant.

Based on the study findings, it is concluded that perceived stress and perceived neighborhood disorder were positively related to BMI percentile. Also, waist circumference as a measure of obesity was not supported in any of the hypotheses. Additionally, acculturation and perceived neighborhood disorders were positively related to perceived stress. However, familism did not mediate the relationship between acculturation and obesity or moderate the relationship between perceived neighborhood disorder and obesity. Adolescent obesity is a public health issue. More research is needed to determine variables that predict obesity in this age group.

Dedication

This manuscript is dedicated to my later parents Mary Lee Johnson and James Collington. God allowed you both to be a part of my life no matter the length of time. To my mother who raised me Dorothy C. Herriott words can't express what you have taught me throughout my life journey, for that I say thank you. To my late grandparents, aunts, uncles, cousins, and friends who've passed away, and did not see this process completed I want to say you all are "my angels in heaven", thank you. Grandma Nora you asked, and I delivered all that you had ever wished for your granddaughter a PhD. in Nursing, I love you to the sky and beyond.

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can remain no matter what life brings. There are no words that I can express but thank you.

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To my siblings Brenda, Stanley, Adrian, Felicia, and my twin, my heart Shawn I love you guys. Each one of you has played a part in my success if you realized it or not. I have learned so many life lessons over the years it can never be repaid. I know our bond as siblings have been tested over the last few years but always remember that God blesses us to be a blessing onto others. We are strong and connected no matter what life situation comes our way.

To my sister in law Joann and brother in law Kevin you both have been a wonderful part of this family. I love you both, and Jo you always make me smile with your words of inspiration and reassurance.

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Table of Contents

Chapter

I. The Problem

Discussion of the Problem	1
Statement of Problem	10
Definition of Terms	10
Delimitation	12
Significance of the Study	12

II. Review of Literature

Descriptive Theories of Obesity	14
Definition of Waist Circumference	14
Empirical Evidence of Obesity in Diverse Groups	15
Empirical Studies Measuring Obesity	16
Empirical Studies Measuring Allostatic Load	17
Descriptive Theories of Acculturation	18
Explanatory Theories Linking Acculturation and Obesity	18
Empirical Support Linking Acculturation and Obesity	19
Descriptive Theories of Perceived Neighborhood Disorder	22
Explanatory Theories Linking Perceived Neighborhood Disorder and Obesity	22
Empirical Studies of Perceived Neighborhood Disorder and Obesity	23
Descriptive Theories of Familism	27

Explanatory Theory Linking Familism and Obesity	28
Empirical Evidence Linking Familism and Obesity	28
Descriptive Theories of Stress	29
Explanatory Theories Linking Perceived Stress and Obesity	30
Empirical Studies Linking Perceived Stress and Obesity	30
Explanatory Theory Linking Acculturation and Familism	32
Empirical Evidence Linking Acculturation and Familism	32
Explanatory Theory Linking Acculturation and Perceived Stress	33
Empirical Evidence Linking Acculturation and Perceived Stress	34
Explanatory Theories Linking Neighborhood Disorder and Perceived Stress	35
Empirical Studies of Neighborhood Disorder and Perceived Stress	35
Familism, Acculturation, and Obesity Mediation Model Explanation	36
Explanatory Theories Linking Perceived Neighborhood Disorder and Familism Moderation Model Explanation	37
Empirical Evidence Linking Perceived Neighborhood Disorder and Familism	37
Theoretical Framework	38
Hypotheses	40
III. Methods	42

Design	42
Research Setting	42
Sample	43
Instruments	50
Body Mass Index (BMI)	50
Attitudinal Familism Scale (AFS)	52
Short Acculturation Scale for Hispanic Youth (SASH-Y)	53
Perceived Neighborhood Disorder Scale (PNDS)	55
The Perceived Stress Scale (PSS)	57
Demographic Data Sheet	60
Procedure for Data Collection	60
Description of the Measurement Procedures	62
Procedure for Weight Measurements	63
Height Measurements	63
Waist Circumference	64
Plan for Data Analysis	64
Human Subjects Protection	66
IV. Analysis of the Data	67
Statistical Descriptions of the Study Variables	67
Psychometric Properties of the Instruments	69
Data Analysis	70
Hypothesis Testing	72
Hypothesis 1	72

Hypothesis 2	72
Hypothesis 3	72
Hypothesis 4	73
Hypothesis 5	73
Hypothesis 6	73
Hypothesis 7	74
Hypothesis 8	74
Hypothesis 9	75
Additional Findings	76
V. Discussion of the Findings	78
Acculturation and Obesity	78
Perceived Neighborhood Disorder and Obesity	80
Familism and Obesity	82
Perceived Stress and Obesity	83
Acculturation and Familism	84
Acculturation and Perceived Stress	85
Perceived Neighborhood Disorder and Perceived Stress	86
Acculturation, Familism, and Obesity	86
Familism, Neighborhood Disorder, and Obesity	88
Additional Findings	89
VI. Summary, Conclusions, Implications, and Recommendations	93
Summary	93

Findings and Conclusion	97
Limitations	99
Implications	101
Recommendations	102
References	104
Appendices	126
A. BMI Growth Chart for girls ages 2-20 years of age	126
B. Family Values Questionnaire	127
C. Culture Questionnaire	129
D. Neighborhood Questionnaire	131
E. Stress Questionnaire	133
F. Demographic Questionnaire	135
G. Letters from Participating School Officials	138
H. Student Assent, and Parental/Guardian Permission and Consent Forms	139
I. Centers for Disease Control and Prevention BMI Measurements	149

List of Tables

Table 1.	Frequency Distribution of Selected Demographic Variables	45
Table 2.	Frequency Distribution of the Birthplace of Study Participant and her/his Mother and Father	47
Table 3.	Descriptive Statistics for Study Variables	69
Table 4.	Coefficient Alpha Reliabilities for the Study Variables	70
Table 5.	Inter-correlation Matrix for the Study Variables	71

List of Figures

Figure 1.	The stress response and development of allostatic load.	3
Figure 2a.	Familism moderation model for Waist Circumference	75
Figure 2b.	Familism moderation model for percent BMI	76

Chapter 1

Discussion of the Problem

The U.S. is currently in the throes of an unprecedented obesity epidemic. It is estimated that more than one-third of U.S. adults and 17% of U.S. children are obese (CDC, 2012). Rates of childhood obesity tripled between 1980 and 2008 (CDC, 2009) and it is currently estimated one out of every six adolescents in the United States is overweight, while one out of every three is at risk for being overweight or obese (Wang, Youfa, Beydoun, & May, 2007). Even more troubling, the prevalence of overweight children and adolescents in the U.S. continues to rise (Hedley, et al, 2004; Ogden, Carroll, & Flegal, 2014). In adults, the Body Mass Index (BMI) is the most commonly accepted index for classification of adiposity and is commonly expressed as the ratio of weight (kg)/ height (meters ²) (Keys, Fidanza, Karvonen, Kimurs, & Taylor, 1972). In children and adolescents, obesity is defined as having a BMI at or above the 95th percentile for age and sex (Ogden, Carroll, Kit, & Flegal, 2014; Singhal, Schwenk, & Kumar, 2007).

With the growing epidemic of childhood and adolescent obesity, there has been an intense interest in identifying the risk factors associated obesity (Kutchman, Lawhun, Laheta, & Heinberg, 2009). Although the trend toward excess body fatness has affected all children, obesity rates appear higher among lower income households, and among Native Americans, Blacks, and Hispanics (Caprio, Daniels, & Drewnowski, et al. 2008). Hispanic (Latino) teenagers are particularly at high risk of being overweight and obese (Ogden, Flegal, Carroll, & Johnson, 2002). Currently, 38.2 percent of Hispanic children

ages 2 to 19 years are overweight or obese, compared with 31.7 percent of all children. higher percentage of Hispanic teens, compared to White teens, report a doctor told them that they were overweight and were given advice about physical activity and healthy eating (USDHHSOMH, 2009). According to a National Health survey conducted by the US Department of Health and Human Services (USDHHS) Office of Minority Health (OMH) a higher percentage of Hispanic girls were overweight and obese when compared to their White non-Hispanic counterparts (USDHHS, 2011). Therefore, any efforts to curtail the rising rates of childhood obesity in the US must address the needs of young Hispanic/Latina females.

There is substantial evidence obesity may result from continuous adaptation to chronic or acute life stressors, through the biobehavioral process known as increased allostatic load (AL). AL refers to the price paid by the body to adapt to adverse psychosocial or physical situations resulting from too much stress or inefficient operation of the stress hormone response systems (McEwen, 2000). Increased AL is a complex system of physiological reactions on body systems that results from chronic over-activity or inactivity of biochemical mediators in response to stress (McEwen & Seeman, 1999). Repeated exposure to psychosocial or physical stressors is accompanied by a sustained release of catecholamines and cortisol, resulting in the deposition of fat in the abdomen, thereby leading to obesity (Björntorp, 2001). Obesity, particularly truncal obesity, is therefore an indicator of a high AL. It is posited in turn that risk factors for chronic disease, such as obesity, are secondary outcomes of increased AL, in the same way that adipose tissue deposits are indicators of obesity (Carlson & Chamberlain, 2005). Although increased AL is characterized by a constellation of signs and symptoms, the

indices of AL most pertinent to obesity are physiological indicators, which include waist circumference and Body Mass Index (BMI). The relationships among chronic exposure to environmental and social stress, the body's ensuing biochemical adaptations and increased AL are illustrated in Figure 1.

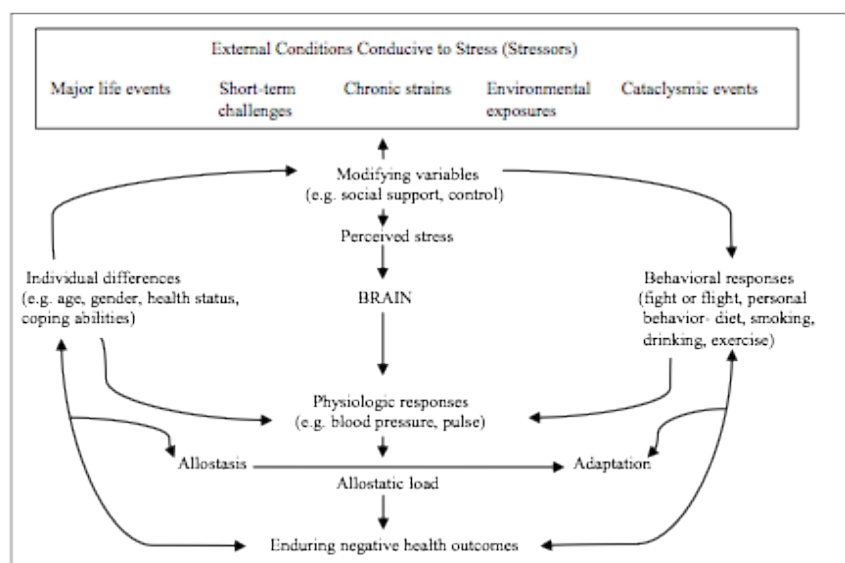


Figure 1. The stress response and development of allostatic load. Note. Adapted from McEwen (1998), and Israel and Schurman (1990). Adapted with permission from Jossey-Bass.

Empirical evidence supports the relationship between increased AL and abdominal obesity (i.e. waist circumference) among Puerto Rican adults (Goodman, McEwen, Huang, Dolan, & Adler, 2005; Mattei, Demissie, Falcon, Ordovas, & Tucker, 2010), and Mexican-Americans (Kaestner, Pearson, Keene, & Geronimus, 2009). Among adults, evidence also supports the relationship between AL (as indicated by abdominal obesity) and neighborhood disorder, acculturation, stress and familism (Kaestner, Pearson, Keene, & Geronimus, 2009; Khan, Sobul, & Matorell, 1997; McEwen & Wingfield, 2002; Peek et al. 2010). Although these four factors have been shown to

contribute to AL among adults, little is known about how increased AL may trigger the genesis of obesity during adolescence.

Obesity has been linked to acculturation (Khan, Sobul, & Matorell, 1997; Sussner, Linsay, Greaney, & Peterson, 2008; Yeh, Viladrich, Bruning, & Royce, 2009). According to Berry (2003), acculturation is the process of cultural and psychological change that follows intercultural contact. This process includes changes in a group's customs and economic and political life. Some of these changes include alterations in attitudes, cultural identity, and social behaviors (Berry, 2003; Berry, Phinney, Sam & Vedder, 2006; Phinney, 2003). It is proposed that the negative effects of acculturation impact physiologic responses and contribute to unhealthy behaviors, such as poor diet and lack of exercise, and ultimately lead to obesity (Finch & Vega, 2003; Steffen, Smith, Larson, & Butler, 2006). There is empirical evidence supporting the association between measures of acculturation (i.e. number of generations in the United States), and BMI (measure of obesity) among Hispanic Americans (Khan, Sobal & Martorell, 1997; Liu, Probst, Harun, Bennett, & Torres, 2009). Other research provides evidence that length of time in the United States is significantly related to obesity (Creighton, Goldman, Pebley, & Chung, 2012).

The acculturation process is associated with and linked to increased rates of obesity between first and second generation Hispanics (Gordon-Larsen, Harris, Ward, & Popkin, 2003; Popkin & Udry, 1998). While new immigrants may have a lower socioeconomic status than individuals born in the US, they ironically may have a greater appreciation of factors such as healthful eating and daily physical activity that contribute to a healthy lifestyle. However, with increased length of time spent in the US, there is a

noted change in the quality of dietary intake, lack of time for proper healthy food preparation, lack of physical activity, and an increase in sedentary lifestyle behaviors (Hubert, Snider, & Winkleby, 2005; Neuhouser, Thompson, Coronado, & Solomon 2004; Sanjur, Immink, Colon, Bentz, et al., 1986; Unger, Reynolds, Shakib, Spruijt, et al., 2004). This process is referred to as the Latino Health Paradox (Markides & Coreil, 1986; Sussner, Lindsay, Greaney, & Peterson, 2008). Consistent with the process of AL, empirical evidence suggests the adverse effects of a low SES living environment, such as substandard housing, crowded streets, lack of safe physical space, and lack of access to fresh healthy foods can contribute to rates of overweight and obesity in this population (CDC and Prevention, 2003; Jackson, 2003; Sussner, Lindsay, Greaney, & Peterson, 2008). Thus, if Latino immigrants are unable to substantially improve their SES through immigration and acculturation, they may be more prone to the development of obesity. The present study examined the relationship between acculturation and obesity in Hispanic female adolescents.

Obesity has also been linked to neighborhood disorder (Boehmer, Hoehner, Deshpande, Ramirez, & Brownson, 2007). Ross and Mirowsky (2001) define neighborhood disorder as a lack of community control as evidenced by high rates of crime, vandalism, graffiti, loitering, public drinking, abandoned buildings, drug use, danger, interpersonal conflicts, and other incivilities associated with declining social control (Geis & Ross, 1998; Hill, Ross, & Angel, 2005; Ross & Mirowsky, 1999). There are a number of mechanisms potentially responsible for this association. Neighborhood disorder can be envisioned as a chronic stressor (Khan, Sobul, & Matorell, 1997), which may precipitate obesity directly through increased AL. Likewise, it has been posited that

poor neighborhood quality or neighborhood disorder contributes to poor nutrition and sedentarism and subsequently to obesity, an indicator of increased AL (Krieger & Higgins, 2002; McEwen, 2001). It is suggested that social upheaval in the community is associated with poorer health outcomes (McEwen & Seeman, 1999). Empirical evidence supports the relationship between obesity and neighborhood disorder among adults (Boehmer, Hoehner, Deshpande, Ramirez & Brownson, 2007; Burdette & Hill, 2006), lower BMI (Evenson, Scott, Cohen, & Voorhees, 2007), and physical activity (Fanzini, Elliott, Cuccaro, et al, 2009). To date, little is known about the effects of neighborhood disorder on AL in children and adolescents. The present study examined the relationship between neighborhood disorder and obesity, an aspect of AL in Hispanic female adolescents.

Obesity has likewise been associated with familism (Austin, Smith, Gianini & Campos-Melady, 2012). Keefe (1979) defines familism as a sense of loyalty and solidarity to the family. Familism (or *familismo* as it is referred to in Spanish) is a key value in Latin American culture and is characterized by close relationships, cohesiveness, and cooperativeness with other family members. Familism is conceptualized as having three dimensions; structural, behavioral, and attitudinal (Valenzuela & Dormbusch, 1994). The structural dimension describes social boundaries, the behavioral dimension defines an individual's feelings about the family and the attitudinal dimension describes the commitment of an individual to the family (Luna, et al., 1996). Attitudinal familism was assessed in this study (Steiel & Contreras, 2003). Keefe (1996) proposes that Mexican Americans have a high degree of familism irrespective of urbanization and other influences. Rodriguez and Kosloski (1998) posit that as Latino acculturation increases,

familism decreases. Others propose that familism and other Hispanic values change because of urbanization and acculturation (Garza & Gallegos, 1985; Grebler et al, 1970). It is further posited that familism may make it more difficult to manage weight and nutrition (Sabogal, et. al, 1987). In a meta-analysis of studies examining infant overfeeding among Hispanic mothers, it was found Hispanic mothers were more likely to initiate early introduction of solid foods including ethnic foods, and perceive chubbier infants as healthy infants (Cartagena et al, 2014). These findings suggest that when it comes to advice regarding childrearing and nutritional matters, immigrant Hispanic women may rely more on their mothers and other female family members than on health care professionals. There is empirical evidence linking familism with obesity and acculturation. In a sample of 100 Mexican- American women participating in a weight management program, Austin, Smith, Gianini and Campos-Melady (2012) found significant negative relationships between familism and exercise goals completed, and between familism and calorie goals completed. Furthermore, familism was negatively correlated with total weight loss from intake to post-treatment. In a sample of 452 Hispanics and 227 White non-Hispanics, Sabogal et al. (1987) reported a negative relationship between familism and the dimensions of acculturation, family obligation and family as referents, with the less acculturated individuals demonstrating greater familism. There are theoretical linkages between acculturation and familism and familism and obesity suggesting that familism may be a mediator between acculturation and obesity. At the same time, familism may have a protective effect, shielding immigrants from the deleterious effects of stressors such as neighborhood disorder. Germán, Gonzalez and Dumka (2009) reported familism was a protective factor for Mexican-origin adolescents,

as it mitigated the negative effects of deviant peer exposure. Similarly, Marsiglia, Parsai and Kulis (2009) noted familism was a powerful protective factor against aggressive behavior, conduct problems, and rule-breaking in a sample of Mexican and Mexican-American adolescents. In the present study, the relationship between acculturation and obesity was examined when familism was controlled for statistically.

Similarly, familism has been linked to acculturation (Crist, et al. 2009; Sabogal et al., 1987). Hispanics are noted to have stronger feelings of familism, cohesion, and family support than their Anglo counterparts (Sabogal et al., 1987). Familism had been noted to be a major and central attribute in the Hispanic/Latino culture with a noted beneficial effect on an individual, and their family (Rodriguez & Kosloski, 1998). As a result, it is noted that among Hispanics/Latinos, levels of familism decrease as individuals become more acculturated into the mainstream US culture (Cuellar, Arnold, & Gonzalez, 1995; Rodriguez, Mira, Paez, & Myers, 2007). In contrast, some research studies have shown that there is a positive relationship between familism and acculturation (Aranda & Knight, 1997; Negy & Woods, 1992; Rodriguez & Kosloski, 1998). In summary, the precise relationship between familism and acculturation is unclear

Acculturation has been linked to stress (Berry & Sam, 1997; Kaplan, 2007). The acculturation process in which an individual integrates new values, beliefs, and cultural practices of a new country may also elicit new external stressors for an individual (Rodriguez, Myers, Flores, & Garcia-Hernandez, 2002). According to Caplan (2007), stress can be defined by environmental demands, an individual's perception of stress, as well as biological responses to stress. Acculturation into a new environment can cause

transference from collectivist to individualistic family processes (Escobar & Vega, 2000). This change is thought of as a dynamic process of adaptation to stress, thus leading to the development of coping mechanisms to respond to the stress (Berry & Sam, 1997; Kaplan, 2007). Individuals who have low levels of acculturation may also have increased environmental stress (Concha, Sanchez, De La Rosa, & Villar 2013; Kaplan, 2007). The stressors that accompany the acculturation process may interrupt the traditional Hispanic/Latino value system. This interruption is posited to limit the health protective effects of the family against negative health outcomes, such as obesity (Dillon, De La Rosa, Ibanez, 2013; Gallo, Penedo, Espinosa & Arguelles, 2009; Marsiglia, Parsai, & Kulis, 2009; Warner et al., 2006). The understanding of the relationship between stress and the acculturation process can give valuable information on how to assist this population with their transition to a new culture and environment. Thus, in this study the relationship between acculturation and stress was examined.

Likewise, perceived stress has also been linked to perceived neighborhood disorder (Latkin & Curry, 2003; Sampson, Raudenbush, & Earls, 1997; Steptoe & Feldman, 2001). Neighborhood disorder is a combination of the lack of social control, and the overall physical manifestation of a neighborhood, such as graffiti, vandalism, and rundown buildings (Ross & Mirowsky, 2001). Perceived stress reflects the extent to which situations in one's life are considered as being stressful (Cohen, Kamarck, & Mermelstein, 1983; Cohen & Williamson, 1988; Larzarus & Folkman, 1984). The chronic stress of living in a neighborhood in which one does not trust their neighbors, where there is an increase in criminal activities, and where there is a lack of social order may lead to a negative impact on a person's health status (Ross & Mirowsky, 2001).

Hence, in this study the relationship between stress and perceived neighborhood disorder was studied.

Statement of Problem

In Hispanic Female Adolescents:

1. What is the relationship between the dependent variable of obesity (BMI percentile for age and sex and waist circumference) and the independent variables of (a) acculturation, (b) perceived neighborhood disorder, (c) perceived stress, and (d) familism?
2. What is the relationship between acculturation and familism?
3. What is the relationship between acculturation and obesity (BMI percentile for age and sex and waist circumference) when familism is controlled for?
4. What is the relationship between acculturation and perceived stress?
5. What is the relationship between perceived stress and perceived neighborhood disorder?
6. Does familism moderate the relationship between perceived neighborhood disorder and obesity (BMI percentile for age and sex and waist circumference)?

Definition of Terms

1. Obesity was defined in the adolescent population as having a body mass index (BMI) at or above the 95th percentile for age and sex (Singhal, Schwenk, & Kumar, 2007).
In this study, obesity was operationalized in two ways: a) as the ratio of adolescent weight and height that is gender and age specific, as measured by the BMI percentile for age and sex; and 2) by the waist circumference (WC), defined as an

- anthropometric indicator of abdominal obesity. Abdominal obesity was operationalized by WC measurement to the nearest centimeter.
2. AL was defined as a complex system of physiological reactions on body systems that results from chronic over activity or inactivity of biochemical mediators in response to stress (McEwen & Seeman, 1999). In this study, AL was operationalized by waist circumference measurements and the calculated BMI percentage for age and sex.
 3. Acculturation was defined as the process of cultural and psychological change that follows intercultural contact (Berry, 1989). Acculturation was operationalized by participants' scores on the 12-item Short Acculturation Scale for Hispanic Youth (SASH-Y) by Barona and Miller (1994).
 4. Perceived neighborhood disorder was defined as a lack of community control and order (Ross & Mirowsky, 2001). Perceived neighborhood disorder was operationalized by participants' scores on the 15-item Perceived Neighborhood Disorder Scale (PNDS) by Ross and Mirowsky (1999).
 5. Familism was defined as a sense of loyalty and solidarity to the family (Keefe, 1979). Familism was operationalized by participants' scores on the 18-item Attitudinal Familism Scale (AFS) by Steidel and Contreras (2003).
 6. Perceived stress was defined as the degree to which situations in one's life are appraised as unpredictable, uncontrollable, and overloading (Cohen, Kamarck, & Mermelstein, 1988). Perceived Stress was operationally defined as participants' scores on the 10-item Perceived Stress Scale (PSS) by Cohen, Kamarck, and Mermelstein (1988)

7. A Hispanic or Latino person was defined as individuals of Cuban, Mexican, Puerto Rican, South or Central American or other Spanish culture of origin regardless of race (CDC, 2012; Office of Management and Budget (OMB) CDC, 2012 website).
8. Immigrant generation was defined as follows:
 First generation: foreign-born immigrants. Second generation-: U.S.-born individuals with at least one foreign-born parent. Third generation-: U.S.-born individual with no foreign-born parents (Creighton, Goldman, Pebley, & Chung, 2012).

Delimitations

The study was delimited to female Hispanic adolescents between 14 and 19 years of age attending an urban high school in central New Jersey. The adolescents were required to be physically and mentally able to complete the questionnaires. Only those adolescents who were able to read and comprehend English were included in the study. Excluded adolescents were those who were currently pregnant, those diagnosed with chronic illnesses or conditions, or physical or mental disabilities such as diabetes, hypertension, cerebral palsy, sickle cell anemia, or psychiatric disorders such as depression, anxiety, or bipolar disease.

Significance of the Study

Although obesity has been extensively studied over the past two decades, much of the literature on adolescent and childhood obesity centers predominantly on the effect of physical activity and dietary behaviors. The nursing literature, in particular, is sparse with regard to the psychological, social, and familial influences on obesity. With the rising rates of adolescent obesity in the U.S., it is apparent that such limited approaches

are not sufficient. Therefore, research that focuses on explication of the psychological, social, and familial factors, which promote childhood obesity will add to the growing body of knowledge and will increase the likelihood of controlling childhood and adolescent obesity.

In summary, this study examined the relationships among acculturation, perceived neighborhood disorder, perceived stress and familism on obesity in a sample of adolescent Hispanic females. All of these stated variables will contribute to the body of knowledge in a population not studied previously. This study additionally enhances the ability of nurses, primary care providers, parents, teachers, and mental health workers to understand the genesis of obesity in this population. The findings of this study should provide new nursing knowledge for the preventive health care of Hispanic female adolescents and can generate much needed knowledge about the relationships among psychosocial aspects of health and obesity in this population.

Chapter II

Review of the Literature

This research study examined the relationships among acculturation, perceived neighborhood disorder, perceived stress, familism and obesity in Hispanic adolescent girls. Descriptive theories of obesity and explanatory theories that link the concepts of acculturation, neighborhood disorder, stress and familism will be discussed. Empirical studies that provide support for the above theoretical relationships are presented. The theoretical rationale and hypotheses conclude the chapter.

Descriptive Theories of Obesity

Obesity is an abnormal or excessive fat accumulation that presents a risk to health (World Health Organization (WHO), 2013). It is specifically measured by a person's body mass index (BMI), defined as the weight in kilograms divided by the square of the individual's height in meters (WHO, 2013). In the adolescent population, obesity is defined as having a BMI at or above the 95th percentile for age and sex (Singhal, Schwenk, & Kumar, 2007). Waist circumference is also used to measure obesity in children and adolescents (Peralta, Jones, & Okley, 2009; Spolidoro et al., 2013).

Definition of Waist Circumference

Waist circumference (WC) in adolescents and children provides an estimate of visceral adipose tissue that gives predictive information regarding health risks (Krebs et al. 2007). Although different anatomical landmarks have been utilized to measure waist circumference, Klein et al. 2007 reports that the most commonly used landmarks in

studies include: (1) the midpoint between the lowest rib and the iliac crest, (2) the umbilicus, (3) narrowest (minimum) or widest (maximum) WC, (4) just below the lowest rib, and (5) just above the iliac crest.

Obesity is considered a secondary outcome of allostatic load (AL), a complex system of physiological reactions on body systems that results from chronic over activity or inactivity of biochemical mediators in response to stressful challenges (McEwen and Seeman, 1999). These primary biochemical mediators, when overactive or inactive, negatively affect body systems. As a result, secondary outcomes, including chronic conditions such as obesity, occur and in turn may lead to hypertension, cardiac disease, and diabetes (Das, 2002; Grundy, 2002; McEwen & Lasley, 2002; McEwen & Seeman, 1999; Neumark-Sztainer, Story, Hannan, & Rex 2003; Van den Berg, Van Eijsden, Galindo-Garre, Vrijkotte, & Gemke 2012). Over time, repeated exposure to psychosocial or physical stressors is accompanied by a sustained release of catecholamines and cortisol, resulting in the deposition of fat in the abdomen (Björntorp, 2001; McEwen, 1998). Therefore, obesity, as measured by its indicators (ie. BMI and waist circumference) is evidence of increased AL (McEwen, 1998; McEwen, 1999; McEwen & Seeman, 1999, 2006). Truncal obesity, as evidenced by increased waist circumference, is the most visible sign of increased AL (Björntorp, 2001).

Empirical Evidence of Obesity in Diverse Groups

Ogden, et al. (2006) studied the prevalence of being overweight and obese in a diverse sample of Mexican American, non-Hispanic Blacks, and non-Hispanic Whites in the US between the years 1999-2004. In the sample, 3958 subjects were children and adolescents, and 4431 were adults. For children and adolescents, overweight was defined

as percentile of BMI, between the 85th to the 95th percentile of the sex specific BMI. The findings demonstrated that overall, 17.9 % of children and adolescents, ages 2 to 19 were overweight in 2003-2004. In the same time frame, over twice as many (37%) Mexican American children and adolescents were overweight. Using multiple logistic regression analysis, significant differences between racial/ethnic groups were found. Male Mexican-American children had a higher prevalence of overweight (OR (95%)=1.73 (CI=1.42-2.10) than non-Hispanic White male children.

Empirical Studies Measuring Obesity

Researchers generally use BMI and waist circumference as the simplest measures of obesity and an indicator of AL. Bassali, Waller, Gower, Allison, and Davis (2010) studied a community sample of 188 healthy obese children aged 7-11 years, the majority of whom were Black (60%) and female (61%). Results showed that waist circumference status sensitively picked up severe obesity 97% of the time, but BMI for age was more sensitive than waist circumference in measuring obesity. Ogden, Carroll, Kit, and Flegal (2012) additionally measured obesity in a multi-racial sample of 4,111 children and adolescents birth through 19 years of age to estimate trends in overweight among this group. Overweight was defined as a BMI at or above the sex-specific 95th percentile on the BMI for age growth charts, and was measured as such. The results demonstrated that there was an increase in the prevalence of overweight children and adolescents from 13.8% in 1999-2000 to 16.0% in 2003-2004.

Empirical Studies Measuring Allostatic Load

Although a plethora of biomarkers have been proposed by which to assess AL, BMI and waist circumference are most commonly used to evaluate obesity (Juster, McEwen, & Lupien, 2010). Barkin, Rao, Smith, and Poe (2012) measured allostatic load in a sample of 207 predominantly White (94%) preadolescent and adolescent children (mean age 13.37 years). BMI, along with other biomarkers, was used to develop an allostatic load index. Waist circumference was additionally used to develop an index of AL in a sample of 352 children, aged 7-10 years, participating in a longitudinal study of asthma (Bahreinian et al., (2013).

Musgrave-Kelly (2008) measured AL in a sample of Black women born in the United States and those foreign-born. BMI was used as a measure of AL and the results showed that Black U.S.-born women had a higher BMI than Black foreign-born women. Schulz et al. (2012) measured AL in a probability sample of 919 low-moderate-income multiracial urban community dwelling adults participating in a cross sectional survey. Waist circumference was among one of the factors used to develop an allostatic load index, the level of which was influenced by various psychosocial factors.

Mattei, Demissie, Falcon, Ordovas and Tucker (2010) studied the relationship between AL and abdominal obesity in a sample of 1449 Puerto Rican adults, aged 45 to 75. Abdominal obesity was measured by a waist circumference of >102 cm in men or > 88 cm in women. AL was calculated from 10 biological parameters, including serum DHEA-S and urinary cortisol (HPV-axis); urinary norepinephrine and epinephrine

(SNS); systolic blood pressure (SBP) and diastolic blood pressure (DBP); plasma HDL-C and TC; plasma Hb/A1c; and waist circumference (WC). The AL score was obtained by obtaining a sum of the number of parameters that participants fell into at the highest cut-off point. Logistic regression models found the four highest categories of AL (excluding WC) were significantly related to abdominal obesity (OR (95%CI) = 1.62 (1.03–2.55), 1.74 (1.08–2.80), 1.84 (1.06–3.20) compared to participants with 0 or 1 AL parameters.

Descriptive Theories of Acculturation

Berry (1989) defines acculturation as a process that occurs when individuals from one culture interact with individuals from another culture. Berry describes four different strategies used by immigrants in the acculturation process: (a) assimilation, where by the immigrant adopts the cultural norms of the host culture, (b) separation, where the immigrant rejects the host culture, (c) integration, where the immigrant adopts the cultural host norms while maintaining the norms of the culture of origin, and (d) marginalization, where the immigrant rejects the norms of both the host culture and the culture of origin.

Explanatory Theories Linking Acculturation and Obesity

Theorists have proposed that more highly acculturated Latinos are more likely to engage in undesirable dietary behaviors placing them at risk for obesity (Lara, Gamboa, Kahramanian, Morales, & Bautista, 2005). Immigrants who move to America may lose some of their healthier eating habits, subsequently resulting in obesity. Others have suggested that the move from rural areas of the home country (where fruits and vegetables are plentiful) to the urban “food deserts” (Cummins & Macintyre, 2002) of the US results in limited access to healthier foods (Perez-Escamilla & Putnik, 2007).

Alternatively, Latino immigrants may consume more calories as a way of coping with the stressors associated with acculturation, a phenomenon Bughi et al (2010) refer to as “food stress.” Lastly, weight gain among immigrant Latinos may have a physiological basis as well. It is postulated that in countries undergoing nutrition transition, changing social and economic conditions foster rapid weight gain (also referred to as catch up weight) among infants and young children who experienced nutritional deficits earlier in life (Popkin, 2001; Popkin & Drenowski, 1997).

Empirical Support Linking Acculturation and Obesity

Khan, Sobal and Martorell (1997) studied the relationship between acculturation and obesity in a sample of 3141 Mexican Americans, 828 Cuban Americans, and 1211 Puerto Rican adults, ages 18 to 74 years. Acculturation was measured by the number of generations the respondent’s family lived in the United States and a self-reported language preference. Results revealed that BMI was significantly greater for second ($b = 1.15, p < .001$) and third ($b = 0.83, p < .001$) generation women in the Mexican American group of subjects. In addition, increased preference for the English language was associated with a decrease of .56 BMI in first ($b = -2.70, p < .05$) and second ($b = -0.92, p < .05$) generation Mexican American women.

Creighton, Goldman, Pebley and Chung (2012) investigated differences in obesity among Mexican-origin individuals and other ethnic groups based on acculturation. Immigrant generation was defined as first generation or US-born, second generation or individuals with at least one foreign-born parent, and third generation, US-born with no foreign-born parents. Generation was further defined as (a) 1st generation Mexican-origin with no foreign-born (b) 1st generation Mexican-origin with >15 years of

residence, (c) 2nd generation Mexican-origin, and (d) 3rd+ generation Mexican-origin. The sample consisted of 1610 first generation Mexicans, second generation Mexicans, third generation Mexicans, third generation Whites, and third generation Blacks, ages < 15 and > 15 . Obesity was measured by a BMI of greater than 30. Acculturation was measured by the Bi-dimensional Acculturation Scale for Hispanics (BAS), which has items on linguistic acculturation and social acculturation. Relative to obesity, the odds of being obese were significantly higher for immigrants with longer status in the U.S (OR= 2.07, $p = < .001$). Further, when linguistic and social acculturation were added to the equation, the odds of being obese increased for first-generation Mexicans in the United States longer than 15 years (OR=1.81, $p = < .001$), and for second-generation Mexicans (OR=2.50, $p = < .001$).

Gordon-Larsen, Harris, Ward, and Popkin (2003) examined the relationship between acculturation and obesity in a national sample of 8613 adolescents, ages 7-12 years. The adolescents were from four ethnic groups: Non-Hispanic Whites ($N= 6727$), Mexican/Chicanos ($N=1151$), Puerto Ricans ($N=398$), and Cubans ($N= 337$). Over-weight was measured by BMI $>85^{\text{th}}$ percentile for age and sex. Acculturation was measured by an acculturation survey. Acculturation data also included the percentage of Hispanic population in the community, proportion of the population that was foreign-born, dispersion in ethnic population, proportion of households that were linguistically isolated, and reported language spoken in the home. Generation was based on items on a questionnaire relative to the adolescents' and parents' place of birth. Generation one included children not born in the U.S., while generation two included children born in the U.S., but with at least one parent who was foreign-born. The findings showed that

overweight prevalence was higher, (although not statistically significant) between U.S. born versus non-U.S. born immigrants with the exception of Mexicans who had greater prevalence of overweight with succeeding generations living in the US. When acculturation measures were added to the model, the predicted overweight prevalence increased for all foreign-born immigrants. Generation differences in predicted overweight decreased among Cubans and Puerto Ricans, but increased among Mexicans. However the relationship between acculturation and overweight did not reach statistical significance.

In summary, acculturation is defined as a process whereby individuals from one culture interact with individuals from another culture. It is proposed that the negative effects of acculturation impact physiologic responses that may contribute to the adoption of unhealthy behaviors, such as poor diet (Finch & Vega, 2003; Steffen, Smith, Larson, & Butler, 2006). The empirical evidence relating to acculturation and obesity is equivocal. Findings suggest that generations in the United States, a measure of acculturation, is significantly related to BMI in Hispanic- Americans (Khan, Sobal & Martorell, 1997; Liu, Probst, Harun, Bennett, & Torres, 2009). Other studies reported the odds of being obese were higher for immigrants with longer status in the United States (Creighton, Goldman, Pebley, & Chung, 2012). Other research found no statistically significant relationship between acculturation and overweight among Hispanic children and adolescents (Gordon-Larsen, Harris, Ward, & Popkin, 2003). There is a need for further studies measuring the impact of acculturation on obesity, beginning in childhood. The present study will examine the relationship between acculturation and obesity in Hispanic female adolescents.

Descriptive Theories of Perceived Neighborhood Disorder

According to Ross and Mirowsky (1999), perceived neighborhood disorder “refers to visible cues indicating a lack of order and social control in the community” (p. 413). When there is no order in the community, there is no peace, safety or observance of the law. When there is no social control, there is no maintenance of order. There are both social and physical cues indicating lack of order and control. As per Skogan (1986, 1990), cues indicating lack of social control include fights, trouble among neighbors, people loitering in the streets, taking drugs, drinking, panhandling, and creating a sense of danger. Cues indicating lack of physical order includes such things as vandalism, graffiti, and littering (Skogan 1986, 1990; Skogan & Maxfield 1981). Cues of disorder exist on a continuum from low levels of disorder on one end to high levels of disorder on the other end.

Explanatory Theories Linking Perceived Neighborhood Disorder and Obesity

Ross and Mirowsky (2009) state that physical and social disorders (neighborhood disorder) create a sense of danger to the individual and the community, preventing them from venturing outdoors. This may lead to obesity due to decreased outdoor physical activity. Krieger and Higgins (2002) propose that poor neighborhood quality is related to poor nutrition, which additionally places persons at risk for obesity. Alternatively, McEwen (2001) posits that the social and physical environment impacts AL parameters (WC and BMI), which may increase, depending on neighborhood quality. McEwen and Seeman (1999) suggest that social upheaval can be considered a chronic stressor about which an individual is likely to have little control and is associated with poorer health outcomes, such as obesity. Thus, neighborhood disorder may be related to obesity.

Empirical Studies of Perceived Neighborhood Disorder and Obesity

Ewart, Elder, and Smyth (2014) examined the relationship between perceived neighborhood disorder and obesity in a multi-racial sample of 167 ninth grade students ($M = 14.4$ years; $SD = 5$ years), 54% of whom were girls. Exactly 41% were African American, 41% were White, and 18% were Native American, Latino or Asian. The students responded to an 11-item Neighborhood Disorder scale. Waist circumference, weight, height, and BMI were measure to assess obesity. Results revealed that perceived neighborhood disorder was positively associated with BMI ($r = .19, p < .01$) and waist circumference ($r = .17, p < .01$).

Burdette and Hill (2008) examined the relationship between perceived neighborhood disorder and obesity in a multi-racial sample of 1,338 adults, 60% of whom were women and 24% of whom were Hispanic. Perceived neighborhood disorder was measured by three items derived from Ross and Mirowsky's (1999) instrument to assess an individual's perception of problems in the neighborhood. The three items examined social disorganization and disorder, hazards, and structural repair. Secondary mediating variables that affected an individual's perception of perceived neighborhood disorder and obesity were also examined. These mediating variables were physiological distress, poor diet quality, and irregular exercise. Physiological distress was measured by the respondents' answer to the question, "How often in the last 30 days have you experienced symptoms such as sweating, shortness of breath, and numbness and tingling of body parts?" Poor diet quality was measured by participants' response to the question, "How would you rate the quality of your diet?" Irregular exercise was measured by the CDC guidelines for regular exercise, defined as exercising five or more

times a week, and strenuous exercise, which occurs three or more times a week. Using ordinary least-squares and binary logistic regression models, the results indicated that neighborhood disorder was associated with increased risk of obesity, and was mediated by psychological distress ($z = 2.14, p < .05$). Also, there was a positive association between psychological stress and obesity, mediated by physiological distress and poor diet quality ($z = 4.67, p < .001$). Furthermore, irregular exercise was shown to be a significant partial mediator between psychological distress and obesity ($z = 2.46, p < .05$). The heights and weights of the subjects were also measured and BMI calculated. Results revealed that perceived neighborhood disorder was positively associated with BMI ($r = .07, p < .01$).

Chen and Wen (2010) examined the relationship between perceived neighborhood disorder and obesity in a sample of 9,115 multiracial adolescents, which included 4,539 females (Latinas ($n = 739$) and Black ($n = 1130$)). Subjects responded to questions about neighborhood context. Obesity was measured by BMI based on self-reported weight and height. Results revealed that neighborhood disorder was positively associated with BMI ($B = .01, p < .05$).

Franzini, Elliott, Cuccaro et al (2009), examined the relationship between physical and social neighborhood environment and obesity in a population of 650 fifth grade students and one of their primary caregivers. Neighborhood social environment was conceptualized as collective efficacy, collective socialization of children, social exchange, social contact and perceived safety. Neighborhood physical environment was conceptualized as traffic, physical disorder, and lower residential density. Obesity was measured by using the child's height and weight found on gender and age specific charts

published by the CDC. The child was determined to be overweight if he/she fell between the 85th and 94th percentiles, and obese if at or above the 95th percentile. A child's physical activity was measured by using face-to-face interview questions of the child and parent from the Youth Risk Behavior Surveillance Survey (YRBSS) that was created by the CDC. Neighborhood perception data was collected from parents by using questions from Human Development in Chicago neighborhood community survey questionnaire (5 items), the neighborhood exchange scale (5 items), the social ties scale (3 items), the traffic scale (2 items), the physical disorder scale (6 items), the residential density scale (1 item), and the mixed land use scale (1 item). Collective efficacy was examined using the Social Cohesion Scale (5 items) to examine closeness, trust, and common values; and informal social cohesion (5 items) to assess willingness to intervene if a community problem occurred. A structural equation model that consisted of two latent variables, neighborhood physical environment and neighborhood social environment as independent variables, physical activity as a mediating variable and child obesity status as the dependent or outcome variable, was tested. Predictors of the latent variable, neighborhood physical environment, consisting of traffic, physical disorder, low density and mainly residential land use, were not significant predictors of the mediating variable, physical activity. Conversely, the latent variable, neighborhood social environment, consisting of measures of collective efficacy, socialization of children, exchange/collective action among neighbors, and ties and safety, were significant predictors of the mediating variable, physical activity ($\beta = 0.13, p < .05$). The mediating variable, physical activity showed a significant negative regression coefficient ($\beta = -0.24, p < .05$) with child obesity status indicating that lower levels of physical activity were

associated with increased child obesity. The findings of the study indicated that neighborhood environment was related to physical activity and obesity after controlling for socio-demographic factors. Also, neighborhood social environment was strongly related to physical activity as compared to the physical environment. Furthermore, it was found that a neighborhood with high collective efficacy increased social cohesion due to close family structures and perception of higher neighborhood safety. Also, high collective efficacy had a positive association with physical activity and a decreased rate of child obesity.

In summary, neighborhood disorder is defined as a lack of community control and order. It is conceptualized as having both physical and social parameters. It is proposed that physical and social disorders create a sense of danger to the individual and community (Ross & Mirowsky, 2001). It is further posited that poor neighborhood quality is related to poor nutrition and impacts AL (Krieger & Higgins 2002; McEwen, 2001). Further, it is suggested that neighborhood disorder in the community is associated with poorer health outcomes, such as obesity (McEwen & Seeman, 1999).

There is empirical evidence that there is a relationship between neighborhood disadvantage and decreased levels of physical activity, reduced sense of being healthy, and an increase in chronic health issues (Ross & Mirowsky, 1999). Further evidence supports the relationship between obesity and neighborhood disorder (Boehmer, Hoehner, Deshpande, Ramirez & Brownson, 2007; Burdette & Hill, 2006), and lower BMI when neighborhoods were perceived as having less crime, children were observed playing outdoors, and had access to physical activity facilities. (Evenson, Scott, Cohen, & Voorhees, 2007). It has also been demonstrated that neighborhood and social

environment were related to physical activity and obesity (Fanzini, Elliott, Cuccaro, et al (2009). Parental obesity was found to be related to adolescent obesity and community disadvantage predicted adolescent obesity (Merten, 2010). Lastly, there is evidence that there is an interaction of maternal responsiveness and cumulative risk on AL (Evans, Kim, Ting, Tesher, & Shannis, 2007). The present study investigated the relationship of neighborhood disorder to obesity in a sample of Hispanic female adolescents.

Descriptive Theories of Familism

Familism is a multidimensional concept defined as a sense of loyalty and solidarity to the family (Keefe, 1979; Villarreal, Blozis, & Widaman, 2005). Familism is conceptualized as having three dimensions; structural, behavioral, and attitudinal (Valenzuela & Dormbusch, 1994). According to Valenzuela and Dormbusch (1994), the structural dimension describes the social boundaries where attitudes find meaning. The behavioral dimension refers to feelings about the family. The attitudinal dimension of familism describes the commitment of an individual to the family rather than to themselves (Luna, et. al, 1996). Familism is known to be one of the most important cultural core values of the Hispanic population (Moore, 1970; Zinn, 1982). According to Luna et al, (1996), familism involves boundaries and proximity of family. The boundaries help to determine who is and isn't family and proximity looks at the importance of interaction between family members and the importance of living close to family members (Luna et al, 1996; Villarreal, Blozis, & Widaman, 2005).

Explanatory Theory Linking Familism and Obesity

Theory suggests that familism may act as an asset in preventing adolescent health problems (Smokowski & Bacallao, 2007). It is also proposed that familism is a protective factor for health. Strong family ties may serve to buffer the stressors experienced by new immigrants and permit family members to better address health promotion needs (Smokowski, Chapman, & Bacallao, 2007). Conversely, strong maternal bonds of familism may cause some women to overfeed their children, beginning in infancy (Cartagena, McGrath, Jallo, Masho, & Myers, 2014). It is also possible that low SES immigrant mothers from food insecure environments may engage in feeding practices likely to promote obesity. Latino immigrant parents may do this in an attempt to provide their children with advantages they did not experience in their home country (Passel & Taylor, 2010). According to the explanatory theory that links familism and obesity, there are noted mixed theoretical perspectives.

Empirical Evidence Linking Familism and Obesity

There is limited empirical evidence that familism predicts weight management adherence. Austin, Smith, Gianini and Campos-Melady (2012), studied the relationship between attitudinal familism, calorie, and physical activity goal completion of 100 Mexican American women. The Attitudinal Familism Scale measured attitudinal familism. Other instruments included a demographic scale and measurement of the participants' height, weight, and BMI. Significant negative relationships were found between familism and step goals completed, ($r(79) = -0.23$, $p < 0.05$ ($d = -0.47$), and familism and calorie goals completed ($r(79) = -0.35$, $p < 0.001$ ($d = -0.75$). Furthermore

familism was negatively correlated with total study weight loss from intake to post-treatment, ($r(58) = -0.30, p < 0.05 (d = -0.63)$).

In summary, theory proposed that familism is an asset and a protective factor for healthy behaviors (Smokowski & Bacallao, 2007; Smokowski, Chapman, & Bacallao, 2007). Limited empirical evidence demonstrated that familism had a negative relationship with weight management adherence (Austin, Smith, Gianini & Campos-Melady, 2012).

Descriptive Theories of Stress

Brown and Harris (1989) viewed stress as specific life events that disrupt an individual's activities and cause external behavioral reactions based on an internal cognitive appraisal of the meaning of the particular event. The effects of these events can be perceived negatively or positively. The stress occurring from these events manifests as internal bodily changes evident by external physiologic signs such as neuro-endocrine changes, alterations in blood glucose levels, and increased heart rate.

Cohen, Kamarck, and Mermelstien (1983) defined perceived stress as “the degree to which situations in one's life are appraised as unpredictable, uncontrollable, and overloading” (p. 385). The appraisal of stress is therefore a subjective sense that varies from person to person and is based upon an individualized evaluation of each situation. McEwen (2006) defines stress as a subjective condition of mind-body interaction in which events, situations, or challenges interpreted as threatening result in physiological and behavioral responses.

In summary, theorists have conceptualized stress as events or experiences perceived as stressful (Brown & Harris, 1989), a condition of the mind-body with resulting responses (McEwen, 2006) and characterized by the appraisal of situations in one's life as unpredictable, uncontrollable, and overloading (Cohen et al., 1983). This definition emphasizes the subjective nature of stress, which subsequently dictates the individualized physiologic and behavioral responses manifested as individual differences among diverse groups. The Cohen et al., (1983) conceptualization of stress was used in this study.

Explanatory Theories Linking Perceived Stress and Obesity

According to McEwen (2006) excess stress may cause people to take in more calories than their bodies need and engage in less physical activity, causing an increase in body weight. Accordingly, stress causes the release of specific hormones, which in turn promote the deposition of body fat (McEwen & Wingfield, 2003). Adrenal stress hormones damage the hippocampus, which when normally functioning, limits unrestricted food intake. Stress often triggers the consumption of comfort food, leading to increase body mass. Therefore, events in daily life may produce chronic stress and increase allostatic load, which is evident by increases in waist circumference over time.

Empirical Studies Linking Perceived Stress and Obesity

DeVriendt et al. (2011) examined the relationship between stress and obesity, as measured by waist circumference and BMI, in a sample of 1121 adolescents aged 12 to 17, 57% of whom were females. Subjects responded to the Adolescent Stress Questionnaire. Their waist circumference, weight and height were measured and BMI calculated. Results revealed that perceived stress was positively associated with waist

circumference in girls ($B = .016, p = .039$) and positively associated with BMI ($B = .003, p = .009$).

Jaarsveld, Fidler, Steptoe, Fonifane, and Wardle (2009) examined the relationship between perceived stress and obesity in a multi-racial sample of 4,065 adolescents, 42% of whom were girls. Subjects completed the Perceived Stress Scale, while assessments of waist circumference, weight, and height were performed and BMI was calculated. Results revealed a positive relationship between perceived stress and waist circumference ($B = .15, p < .001$) and perceived stress and BMI ($B = .17, p < .001$).

Farag et al. (2008) examined the relationship between cortisol levels (a measure of stress), and BMI and waist circumference in a sample of 78 women. The women's waist circumference, height and weight were measured and the cortisol levels were analyzed. The results revealed that waist circumference was significantly related to cortisol levels in overweight women ($B = .029, p = .02$). BMI was also significantly related to cortisol levels in obese women ($B = -.099, p = .01$).

Epel et al., (2000) examined the relationship between cortisol levels, a measure of stress and obesity (waist circumference and BMI) in sample of 59 women aged 30 to 46 years. Subjects responded to the Social Stress Index. Cortisol levels (as physiologic measures of stress) were sampled as the women were exposed to various stress challenges. BMI was calculated based on weight and height. Waist circumference was measured twice at the midpoint between the upper iliac crest and the lower costal margin in the mid-axillary line. Results revealed that women with a high waist to hip ratio reported higher levels of chronic stress ($F(3,51) = 4.0, p < .025$). In addition, waist to hip ratio was positively related to reactive cortisol levels ($r = .29, p < .05$).

In summary, positive relationships have been found between stress and obesity among female adolescents (DeVriendt, 2011; Jaarsveld, Fidler, Stptoe, Foniface, & Wardle, 2009), and adult women (Epel, 2000; Farag et al., 2008). Though these relationships are weak to moderate, they provide empirical support for the theory linking these factors. Few studies have addressed this relationship among female adolescents and none have specifically studied Hispanic adolescent females.

Explanatory Theory Linking Acculturation and Familism

Theory suggests that maintenance of cultural values such as familism slows the rate of acculturation (Romero, Robinson, Haydel, Mendoza & Killen, 2004). Steidel and Contreas (2003) state that highly acculturated individuals have lower adherence to familism. In contrast, Keefe, Padilla, and Carlos, (1979) state as extended family systems becomes larger and better integrated from first generation immigrants to the next, the number of family members grows, thus allowing for an increase in family support, locally related households, ties in the social network, and increase in mutual family aid.

Empirical Evidence Linking Acculturation and Familism

Sobogal et al. (1987) studied the effects of acculturation on attitudinal familism in 452 Hispanic adults compared to 227 white non-Hispanics. A questionnaire was used to measure attitudinal familism, behavioral acculturation. The researcher subjected the data to principal component factor analysis with varimax rotation. Three factors emerged from the data; Family Obligation accounted for 27.7% of the total variance with a Cronbach's alpha of .76; Perceived Support from the Family which explained 10.9% of the total variance with and alpha reliability of .70; and Family as Referents accounting

for 9.8% of total variance and a Cronbach's alpha of .64. The results showed a significant contribution to the familism dimensions due to acculturation (Hotelling's $T^2 = .14$, $F = 21.40$, $p < .001$). The less acculturated participants reported higher levels in the dimension of Familial Obligation ($M = 4.44$; $F(1, 399) = 51.15$, $p < .001$) and Family as Referents ($M = 3.41$; $F(1, 403) = 41.90$, $p < .001$) than the highly acculturated individuals ($M = 3.97$ and $M = 2.79$ respectively).

In summary, attitudinal familism is proposed to be associated with acculturation and weight management. It is the purpose of this study to investigate the relationships between attitudinal familism and acculturation and the relationship between attitudinal familism and obesity. Furthermore, the study found that acculturation contributes negatively to familism (Rodriguez & Kosloski, 1998) and that familism contributes positively to obesity (Steffen, Smith, Larson, & Butler 2006; Finch & Vega 2003). Some research has supported the relationship between acculturation and familism (Kaestner, Pearson, Keene, & Geronimus, 2009). In addition, research has supported the relationship between familism and weight management (Austin, Smith, Gianini & Campos-Melady, 2012). Thus, a mediational model among the three variables was proposed to investigate the extent that familism mediates the relationship between acculturation and obesity.

Explanatory Theory Linking Acculturation and Perceived Stress

Although acculturation is sometimes used as a proxy for acculturation stress (Caplan, 2007), empirical evidence suggests that it is not the acculturation process itself but the stress of adapting to life in a new country that has the greatest impact on the

physical and emotional health of Latino immigrants. Green et al. (2010) propose that acculturation may lead to psychological symptoms and stress. Mangold, Wand, Javors, and Mintz (2010) posit that acculturation is linked to deregulation of the cortisol-awakening response, a physiological stress indicator. However, because explanatory theory does not support the assumption that acculturation stress should decrease with length of time in the host country, there is no clear evidence that perceived stress increased with acculturation.

Empirical Evidence Linking Acculturation and Perceived Stress

Most of the empirical evidence on acculturation and stress used acculturation stress as a variable. Mangold, Wand, Javors, and Mintz (2010) studied the relationship between acculturation, childhood trauma and the cortisol-awakening response (CAR) in 59 Mexican-American adults, aged 18 to 38. Acculturation was measured by the responses on The Revised Acculturation Rating Scale for Mexican Americans. Measurement of the cortisol awakening response was accomplished through the participants' placement of a cotton ball in their mouths. The specimen was collected, stored, and analyzed using an evidence-based protocol. The findings demonstrated that higher levels of acculturation were associated with a decrease in CAR.

Green et al. (2010) studied the relationship between psychological status, acculturation and country of origin in a sample 419 Hispanic women, aged 42-51. Acculturation was measured by the four questions relative to language spoken, reading and thinking. Perceived stress was measured by the participant's response on the shortened version of the Perceived Stress Scale. The findings showed that Hispanic women who were less acculturated reported more perceived stress ($p < .001$). They also

found that psychological functioning was related to greater acculturation ($p < .01$) and that psychological symptomatology differed according to country of origin and that the adverse profile of Puerto Rican women was not explained by acculturation. The discrepancy of these findings illustrates the lack of a definitive relationship between acculturation and perceived stress.

Explanatory Theories Linking Neighborhood Disorder and Perceived Stress

Theorists propose that stress may be an outcome of neighborhood disorder. According to Hill, Ross, and Angel (2005) stress may result from living in a neighborhood characterized by physical and social disorder. As these authors state, it is distressing to be exposed to disadvantage, decay, and disorder in one's neighborhood. McEwen (2000) theorizes that since AL is the price the body pays for being forced to adapt to adverse psychosocial or physical situations, which produce inefficient operations of the stress hormone response system, daily exposure to threatening stressful environments inherently increases AL and ultimately impairs health.

Empirical Studies of Neighborhood Disorder and Perceived Stress

Hill, Ross, and Angel (2005) examined the relationship between neighborhood disorder and psychological stress in a sample of 2,402 mothers in low-income neighborhoods. These mothers responded to a 10-item scale measuring neighborhood social disorder and the Brief Symptom Inventory, a measure containing a variety of stress indicators. Results revealed that neighborhoods with high levels of disorder were associated with more perceived stress in the sample ($r = .18, p < .01$).

Burdette and Hill (2008) examined the relationship between perceived neighborhood disorder and stress in a sample of 1338 community-dwelling older adults,

60% of whom were women. Subjects responded to a 3-item scale measuring neighborhood disorder, a 6-item scale measure of psychological stress, and a 3-item measure of physiologic stress. Results revealed that neighborhood disorder was positively related to psychological stress ($r = .20, p < .001$) and positively related to physiological stress ($r = .16, p < .001$).

Step toe and Feldman (2001) examined the relationship between neighborhood disorder and stress in a sample of 658 adults between the ages of 18 and 94, 57% of whom were women. Subjects responded to the General Health Questionnaire, which measures stress, and a 10-item questionnaire measuring physical neighborhood disorder. Stress was associated with neighborhood disorder (42.2%); twice the number of respondents in disorderly neighborhoods reported significant stress, compared to respondents in orderly neighborhoods (21.5%).

In summary, positive weak relationships have been found between perceived neighborhood disorder and stress in adults, including mothers (Hill, Ross, & Angel, 2005) and adult women (Burdette & Hill, 2008; Steptoe & Feldman, 2001). These studies provide empirical support for the theory linking neighborhood disorder and stress. Few studies have examined the positive relationship between the variables in adolescents and none have explored the relationship among Hispanic female adolescents.

Familism, Acculturation, and Obesity

Mediation Model Explanation

It is posited that as Latino acculturation increases, familism decreases (Rodriguez & Kosloski, 1998). It is also posited that familism and other Hispanic values change because of urbanization and acculturation (Garza & Gallegos, 1985; Grebler et al, 1970). It is further posited that strong family ties may serve to buffer the stressors experienced

by new immigrants and permit family members to better address health promotion needs (Smokowski, Chapman, & Bacallao, 2007). Conversely, strong maternal bonds of familism may cause some women to overfeed their children, beginning in infancy (Cartagena, McGrath, Jallo, Masho, & Myers, 2014). Keefe (1996) proposes that Mexican Americans have a high degree of familism irrespective of urbanization and other influences.

Explanatory Theories Linking Perceived Neighborhood Disorder and Familism

Moderation Model Explanation

Schofield et al. (2012) posit that neighborhood disorder is linked to negative developmental outcomes in children, and that family support buffers against the negative effects of neighborhood disorder. Roosa et al. (2003) states that family practices may mediate or moderate the relationship between neighborhood disorder and negative developmental outcomes in children. Roosa et al. (2003) suggests that family warmth and support influences perceptions of neighborhood disorder. Leventhal and Brooks-Gunn (2000) propose that parental support may mediate the relationship between neighborhood characteristics and children and adolescent wellbeing. Roosa et al. (2005) suggest that differences in cultural values and beliefs may alter the way neighborhood risk influences children.

Empirical Evidence Linking Perceived Neighborhood Disorder and Familism

Schofield et al. (2012) studied the degree to which family supportiveness acted as a buffer between neighborhood disorder and child antisocial behavior in a sample of 673 Mexican families. Neighborhood disorder was assessed by the child's responses on the

ten-item Neighborhood Criminal Events Scale, and family processes were assessed by computer-based interviews. Measures of antisocial behavior included participants' responses on the Intent to Use Controlled Substances and the Computer-based Diagnostic Interview for Children scales. The researchers found that parent support predicted lower levels of perceived neighborhood disorder ($\beta = -0.18$, $SE = 0.04$). The findings also showed that the interaction between parent support and child rating of neighborhood disorder was significant in predicting child antisocial behavior ($\beta = -0.15$, $SE = 0.05$).

In summary, theory suggests that family supportiveness buffers the relationship between neighborhood disorder and child antisocial behavior and that family warmth influences perception of neighborhood disorder (Schofield et al., 2012). Family practices may moderate or mediate the relationship between neighborhood disorder and child outcomes (Leventhal & Brooks-Gunn, 2000; Roosa et al., 2003). Theory also supports that differences in cultural beliefs may alter the way neighborhood risk influences children (Roosa et al. 2005). One empirical study demonstrated that there was an interaction between parent support and child rating of neighborhood disorder and child anti-social behavior (Schofield et al., 2012).

Based on theory and some empirical findings, family support and solidarity (familism) may moderate the effect between perceived neighborhood disorder and obesity in Hispanic adolescent females.

Theoretical Framework

Bronfenbrenner's (1977) ecological theory of human development will be used as the theoretical framework for this study. The ecological perspective has proposed that

there are many factors at multiple system levels that interact and influence a person's wellbeing (Ayon, Marsiglia, & Bermudez-Parsai, 2010). According to Hancock (2005), the ecological perspective is well suited to the understanding of structural implications that may affect Latino families, as well as strengths correlated with Latino culture. The ecological theory of human development proposes that throughout the lifespan, there is a progressive human-environmental relationship. The environment is the immediate setting in which the individual lives and the larger social context. The ecological environment is made up of the microsystem, mesosystem, exosystem, and macrosystem. The microsystem is a complex relationship between the developing person and the environment in the immediate setting in which the individual is found. The setting has physical features where the individual engages in activities and roles for a period of time. The elements of the setting are place, time, physical features, activities, people, and roles. Roles may include daughter, employee, parent, or teacher. The mesosystem is a system of microsystems comprised of the multiple settings that contain the developing person at a particular point in his or her life. An extension of the mesosystem is the exosystem that embraces informal and formal social structures that impact the individual. The exosystem does not contain the individual, but rather impinges on the immediate setting in which the person is found. Examples of the exosystem are social structures such as neighborhoods, the media, transportation, and informal social networks. The macrosystem is comprised of the culture and subculture that impacts the individual and family. The macrosystem sets the pattern for activities occurring at the concrete level. Most macrosystems are informal, in that they are made up of ideology that is manifested in customs and practices in everyday life. The macrosystem is the institutional patterns

of the culture or subculture, such as economics, politics, and educational systems, of which the microsystem, mesosystem, and exosystem are concrete manifestations.

Using this framework, AL is a physiological reaction of body systems to environmental stress (McEwen, 2002). It is posited that obesity is a secondary outcome of AL that is related to lifestyle choices that lead to health-related problems (Neumark-Sztainer, Story, Hannan, & Rex, 2003). It is further proposed that the negative effects of acculturation, a part of the macrosystem, can contribute to unhealthy behaviors, such as poor diet and sedentary physical activity (Finch & Vega, 2003; Steffen, Smith, Larson, & Butler, 2006). Familism is defined as a sense of loyalty and solidarity to the family, a part of the microsystem (Keefe, 1979). It is posited that as Latino acculturation increases, familism decreases (Rodríguez & Kosloski, 1998). It is further proposed that familism may make it more difficult to manage weight and nutrition (Sabogal, et. al, 1987) or alternatively, it may mediate or moderate the deleterious effects of neighborhood disorder on obesity. Neighborhoods are part of all of the systems in the ecological model. It is proposed that physical and social disorders create a sense of danger and can serve as chronic stressors to the individual and community (Ross & Mirowsky, 2001). It is further posited that poor neighborhood quality is related to poor nutrition (Krieger & Higgins, 2002; McEwen, 2001).

Hypotheses:

In the study of Hispanic adolescents, it is predicted that:

1. There is a positive relationship between acculturation and obesity (waist circumference and percentile of BMI for age and sex).

2. There is a positive relationship between perceived neighborhood disorder and obesity (waist circumference and percentile of BMI for age and sex).
3. There is a negative relationship between familism and obesity (waist circumference and percentile of BMI for age and sex).
4. There is a positive relationship between perceived stress and obesity (waist circumference and percentile of BMI for age and sex).
5. There is a negative relationship between acculturation and familism.
6. There is a positive relationship between acculturation and perceived stress.
7. There is a positive relationship between perceived neighborhood disorder and perceived stress.
8. When familism is controlled for statistically, the relationship between acculturation and obesity (waist circumference and percentile of BMI for age and sex) will diminish.
9. Familism will moderate the relationship between perceived neighborhood disorder and obesity (waist circumference and percentile of BMI for age and sex).

Chapter III

Methods

This chapter presents the description of methods of the correlational research design used in the present study. The study examined the proposed relationships among each of the independent variables of acculturation, perceived neighborhood disorder, perceived stress and familism and the dependent variable of obesity as measured by BMI percentile for age and sex and waist circumference (WC), in a sample of adolescent Hispanic females. This chapter includes a discussion of the design, research setting, sample, instruments, data collection methods, and plan for data analysis.

Design

This study was a cross-sectional, explanatory study. The hypotheses were tested using correlational and multiple regression analyses.

Research Setting

This study was conducted in a large public high school located in an urban community in Central New Jersey. The city has a population of about 50, 244 people, of whom approximately 50.20 % are Black or African American, 40.37 % are Hispanic/Latino, and 23.54% are White. The public high school has an enrollment of about 1360 students of which approximately 57% are Black or African American and 42% are Hispanic/Latino. Also, approximately 65.1% of the students enrolled in the school are classified as economically disadvantaged. All data collection and measurement took place in the nurse's suite on the first floor of the high school, after parental consents, student consents, and student assents were collected. The approval of

the Institutional Review Board (IRB) of Rutgers the State University of New Jersey, the permission of the Plainfield Board of Education and permission of high school administration, and individual teachers, and staff were all obtained prior to data collection.

Sample

A non-probability convenience sample was used in this study. Participants were comprised of first and second-generation immigrant Hispanic female students between the ages of 14 and 19 years, who attended the senior high school. All participants met the delimitations of the study, which included Hispanic females, mentally and physically able to complete the study instruments, and capable of understanding the English language instruments as evaluated by the teacher and/or school nurse and communicated to the researcher. All participants met with the principal researcher in small groups during their lunch period prior to data collection, so that the study and data collection could be explained and questions answered.

During the data collection procedure, 199 female students were recruited to participate in the study. The study participants were recruited during their lunch periods following small group discussions regarding the study with the principal researcher. The participants in the study varied by age, countries of origin, and parental status (some were single teenage mothers). Students were given information about the incentive prizes (one iPad mini, one Kindle Fire HD, two target gifts card, two Wal-Mart gift cards, and two iTunes gifts cards) that were raffled off to those who completed the surveys and body measurements. Of the 199 who agreed to participate, twelve students were removed

because of chronic medical conditions, four were pregnant, ten students were found not to be attending classes, and an additional four students withdrew from the study because of personal reasons. Thus, the final sample size was 169 Hispanic female students who met the delimitations of the study as assessed by the researcher.

Subjects in the final sample were 14-19 years of age ($M=16.12$, $SD=1.328$). The students who were under the age of 18 years of age were given an information sheet about the study, a parental consent, and a student assent, which was completed and returned to the researcher prior to data collection. Thirty-two students who were 18 years of age and older were permitted to sign their consents independently and returned them to the researcher prior to data collection. Of the sample of 169 participants, 18.93% were freshman, 24.85% were sophomores, 31.36% were juniors, and 24.85% were seniors. The sample consisted of 49.7 % of students who were first generation immigrants, and 50.3 % of students who were second-generation immigrants. Twelve countries of origin were represented in the sample (See Tables 1 and 2).

Based on the theoretical and empirical literature, a small to moderate effect size (eta squared = .05, $f^2 = .08$) was anticipated in this study (Chinn, 2000; Cohen, 1988; Tabachnick & Fidell, 2007). Given an alpha of .05, small to medium effect size, and four independent variables, a minimum sample of 160 subjects was calculated to achieve a power of .80 (Cohen, 1988).

Table 1.

Frequency Distribution of Selected Demographic Variables

Characteristic	N	%
Ages		
14	19	11.2
15	44	26.0
16	38	22.5
17	36	21.3
18	29	17.2
19	3	1.8
Race or Ethnicity		
Black or African American	4	2.4
Hispanic/Latino	161	95.3
White	4	2.4
Language Spoken at Home		
English Only	2	1.2
Spanish Only	39	23.1

Both English and Spanish	128	75.7
Grade in High School		
Freshman	32	18.9
Sophomore	42	24.9
Junior	53	36.5
Senior	42	24.9
Weight Category		
Underweight	4	2.4
Normal Weight	97	57.4
Overweight	34	20.1
Obese	34	20.1

Table 2.

Frequency Distribution of the Birthplace of Study Participant and her/his Mother and Father

Birthplace	Individual	N	%
Argentina	Study Participant	1	.6
	Mother	1	.6
	Father	1	.6
Columbia	Study Participant	2	1.2
	Mother	4	2.4
	Father	3	1.8
Dominican Republic	Study Participant	18	10.7
	Mother	29	17.2
	Father	30	17.8
Ecuador	Study Participant	19	11.2
	Mother	27	16.0
	Father	29	17.2
El Salvador	Study Participant	23	13.6
	Mother	39	23.1

	Father	34	20.1
Guatemala	Study Participant	7	4.1
	Mother	22	13.0
	Father	22	13.0
Honduras	Study Participant	5	3.0
	Mother	13	7.7
	Father	12	7.1
Mexico	Study Participant	8	4.7
	Mother	17	10.1
	Father	20	11.8
Nicaragua	Study Participant	---	---
	Mother	2	1.2
	Father	2	1.2
Peru	Study Participant	1	.6
	Mother	4	2.4
	Father	3	1.8
Puerto Rico	Study Participant	1	.6

United States	Mother	7	4.1
	Father	9	5.3
	Study Participant	84	49.7
	Mother	4	2.4
	Father	4	2.4

Instruments

Body Mass Index (BMI)

BMI is the ratio of an individual's weight to height, and is used to estimate a person's risk of weight-related health problems (Nihiser et al., 2007). The formula for calculating BMI is as follows: $\text{Weight (pounds)} / \text{Height (inches}^2\text{)} \times 703 \text{ (lbs/in}^2 \times 703\text{)}$. Once BMI is calculated, it is plotted by age on a sex-specific growth chart and converted to a percentile as shown in Appendix A. Youth BMIs are classified as follows:

- Obese if the BMI is at or above the 95th percentile for age and sex.
- Overweight if the BMI is at or above the 85th percentile and below the 95th percentile for age and sex.
- Normal weight if the BMI is at or above the 5th percentile and below the 85th percentile for age and sex.
- Underweight if the BMI is below the 5th percentile for age and sex.

BMI measurements require durable equipment including a balanced scale to measure weight and a stadiometer to measure height, both of which must be regularly maintained and calibrated. The measurements were performed after the removal of shoes, hats, heavy jackets, or other bulky clothing. Student privacy was maintained during the measurement procedure.

BMI results in children and adolescents need to be interpreted with caution because height, weight, bone mass, and percent body fat change at different times and rates during the growth spurts that characterize child development, especially during puberty (Troiano & Flegal, 1998).

Attitudinal Familism Scale (AFS)

The Attitudinal Familism Scale (AFS; see Appendix B) is a 18-item self-report instrument designed to measure four components of attitudinal familism that include familial support, familial interconnectedness, familial honor, and subjugation of self for family (Steidel & Contreras, 2003). In this study, the AFS was given the name Family Values Questionnaire for administration to study participants for ease of understanding (the actual scale name is included as a footnote at the end of the scale items). Each of the items is scored on a Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree). Scores range from 18 to 90, with higher scores denoting increased levels of attitudinal familism. Using a sample of 125 Latinos older than 18 years and residing on the west side of Cleveland, Ohio, the authors performed principal components factor analysis with oblique rotation that resulted in four conceptually clear factors that accounted for 51.23% of the variance on the 18 items. The factors included Familial Support, the belief that family members have an obligation to offer emotional and financial support to other family members regardless of the circumstances; Familial Interconnectedness, the belief that family members must keep both emotional and physical closeness with other family members in accordance with the structure set by the family hierarchy; Familial Honor, the belief that it is an individual's duty to uphold the family name; and Subjugation of Self for Family, the belief that a person must be submissive and yield to the family. Schwartz (2007) performed a confirmatory factor analysis on the 18-item AFS to determine if the factor structure was consistent with that reported by Steidel and Contreras (2003), in a study sample of 318 Hispanic, non-Hispanic White, and non-Hispanic Black young adults and concluded that the published

factor structure by Steidel and Contreras provided an adequate fit to the sample data consisting of Hispanic, non-Hispanic White, and non-Hispanic Black young adults.

With regard to content validity, Steidel and Contreras (2003) adapted items from existing attitudinal familism scales, together with the development of original items that corresponded to their definition of attitudinal familism. The Cronbach's alpha reliability coefficient for the total scale was .83, and the alpha for the factored subscales was .72 for Familial Support, .69 for Familial Interconnectedness, .68 for Familial Honor, and .56 for Subjugation of Self for Family (Steidel & Contreras, 2003). Austin, Smith, Gianini and Campos-Melady (2012), in a sample of 100 Mexican-American women who participated in a weight management program, reported a Cronbach alpha reliability coefficient of .88, for the AFS. Schwartz (2007) reported a Cronbach alpha reliability coefficient of .83 in a sample of Hispanic, non-Hispanic White, and non-Hispanic Black young adults. Validity reported by Steidel and Contreras (2003) was shown by significant negative correlations between acculturation and the total Attitudinal Familism scale ($r = -.26, p < .01$); Familial Support subscale ($r = -.26, p < .01$); and Familial Honor subscale ($r = -.29, p < .01$). Additionally, significant correlations were shown between first-generation respondents and total Attitudinal Familism ($r = -.24, p = .01$); and Familial Honor subscale ($r = -.32, p < .01$), indicating there is greater adherence to attitudinal familism by first-generation than second-generation respondents. Higher education level also correlated significantly with lower Attitudinal Familism ($r = -.21, p = .02$).

Short Acculturation Scale for Hispanic Youth (SASH-Y)

The Short Acculturation Scale for Hispanic Youth (SASH-Y; see Appendix C) is a 12-item self-report instrument designed to measure cultural behaviors from both the

context of the family and the context of extrafamilial social and media influences (Barona & Miller, 1994). The unidimensional acculturation scale focused on preferences for language and ethnicity of friends and acquaintances. To facilitate ease of understanding, the researcher changed the name of the scale in this study to the Culture Questionnaire (actual scale name is included as a footnote at the end of the scale items). Items are scored on a scale of 1 to 5, whereby item #1 is scored as 1 (Only Spanish), 2 (Spanish better than English), 3 (Both Equally), 4 (English better than Spanish), and 5 (Only English); items 2 through 9 are scored as 1 (Only Spanish), 2 (More Spanish than English), 3 (Both Equally), 4 (More English), and 5 (Only English); and items 10 through 12 are scored as 1 (All Hispanic), 2 (More Hispanic than White), 3 (About Half & Half), 4 (More White than Hispanic), and 5 (All White). Item responses are summed across all 12 items to form a SASH-Y composite score ranging from 12 to 60, with higher scores indicating higher acculturation to the U.S. society.

The SASH-Y represents a modification of the Short Acculturation Scale for Hispanics (SASH) developed by Marin, Sabogal, Marin, Otero-Sabogal, and Perez-Stable (1987). Items in the original 12-item SASH measured English/Spanish used as a child, language used when interacting with friends or at work, ethnicity of lovers, ethnicity of neighbors when growing up, preferences for electronic and printed media, and ethnicity of friends for self and for one's children. Modifications of the SASH by Barona and Miller (1994) included replacement of two items that reflected family context that was underrepresented in the SASH; the item responses were reworded to facilitate there differentiation by younger children. Exploratory factor analysis using the maximum likelihood method of factor extraction with Promax factor rotation was used in a sample

of 141 Hispanic youth in Grades 5 through 8 to determine structure of the SASH-Y (Barona & Miller, 1994). A three-factor solution, accounting for 72.5% of the variance, resulted in the following factors: Extrafamilial Language Use (e.g., language preference of media, of friends); Familial Language Use (e.g., language use within a family context); and Ethnic Social Relations (e.g., preferences in social relations).

Discriminant validity was shown, whereby the Hispanic sample mean for the SASH-Y composite was 54.7 (SD = 4.4) and was 41.1 (SD = 10.5) for the non-Hispanic White sample ($F(1,370) = 22.97, p < .0001$), demonstrating that the scale discriminated between Hispanic and non-Hispanic White subjects' expressed levels of acculturation (Barona & Miller, 1994). Cronbach's alpha reliability coefficient for the total sample was .94 and was .92 and .85 for the Hispanic and non-Hispanic samples, respectively. Odd-even split-half reliability coefficients using the Spearman-Brown prophecy for the total sample was .96 and was .95 and .87 for the Hispanic and non-Hispanic samples, respectively.

Perceived Neighborhood Disorder Scale (PNDS)

The Perceived Neighborhood Disorder Scale (PNDS; see Appendix D) is a 15-item self-report tool designed to measure both social and physical disorder, reports of crime in the neighborhood, and both ends of the order–disorder continuum (Ross & Mirowsky, 1999). The tool consists of four concepts: Physical Disorder, Physical Order, Social Disorder, and Social Order. Items are scored: 1 (Strongly Disagree), 2 (Disagree), 3 (Agree), and 4 (Strongly Agree). Items numbers: 5, 6, 12, 13, 14, and 15 are reverse-scored: 1=4, 2=3, 3=2, 4=1. Thus, high scores indicate greater perceived neighborhood

disorder. Using a random sample ($N = 2,482$) from the 1995 Survey of Community, Crime and Health from Illinois households, principal component exploratory factor analysis with oblique rotation was performed that resulted in extraction of two factors that distinguished between Disorder (negatively worded items) and Order (positively worded items). The authors proceeded to examine the data through a covariance structure model using EQS (Bentler, 1989) to test whether Disorder is one coherent factor or whether Physical and Social Disorder, Order and Disorder, and Crime and Disorder are distinct. Results from the latter procedure indicated two distinct factors, Disorder and Decay, although the factors were highly related. Furthermore, they concluded that Social and Physical aspects of perceived disorder indicate one underlying concept and that Order and Disorder form two ends of a single continuum.

With regard to content validity, items for the concept Disorder were derived from previous measures of neighborhood incivilities, problems, and disorder. Items for the concept Order were derived either from semantic opposites of disorder, such as safe versus dangerous and clean versus dirty, or a more direct operationalization of the concept with statements such as, “In my neighborhood, people watch out for each other” (Ross & Mirowsky, 1999). The covariance structure model showed a satisfactory Comparative Fit Index of .958 and support for construct validity. The Cronbach’s alpha reliability coefficient for the total scale was .921.

Ross and Mirowsky (1999) recommend attention to whether individual indicators should be eliminated, depending on whether they are potentially confounded with independent or dependent variables of interest. They proceeded to suggest a short 10-item scale of perceived neighborhood disorder consisting of items pertaining to: graffiti,

noise, vandalism, clean neighborhood, people hanging out, crime, drug use, alcohol use, trustworthy neighbors, and a safe neighborhood. Ross and Jang (2000) using the same sample as Ross and Mirowsky (1999) used the suggested short 10-item scale of perceived neighborhood disorder to examine the buffering role of social ties with neighbors on neighborhood disorder, fear, and mistrust. The Cronbach's alpha reliability coefficient for the scale was .915.

The Perceived Stress Scale (PSS)

The Perceived Stress Scale (PSS) is a 14-item self-report unidimensional measure of perceived stress, defined as the degree to which situations in one's life are appraised as stressful because they are unpredictable, uncontrollable, and overloading (Cohen, Kamarck, & Mermelstein, 1983; see Appendix E). Items on this scale ask about feelings and thoughts throughout the last month signifying current levels of stress. Subjects answer questions on a 5-point summated rating scale (0 = never to 5 = very often) to questions, which ask how often they felt a certain way. Scores can range from 0 to 56 with higher scores representing higher discernment of stress. Total scores are acquired by reversing answers to seven positively stated items and then summing across all scale items. The shortened 10-item version of this scale, the PSS-10, was used in this analysis since it has higher internal consistency (coefficient alpha = .78) compared to the 14-item PSS's internal reliability coefficient alpha = .75 (Cohen et al., 1983; Cohen & Williamson, 1988). Scores for this 10-item version can range from 0 to 40 with higher scores indicating higher present levels of stress.

Relative to content validity, items on the original (14-items) PSS were developed

based on the operation model of stress conceptualized by Lazarus (1966, 1977) and stress literature which centered on cognitive assessment and emotional reactions as measures of the extent to which events are perceived as stressful (Cohen et al., 1983). Items were also created for community samples with at least a junior high school education. The items were developed to be easy to understand, simple to answer and general enough to prevent emphasis on any subpopulation or group (Cohen et al., 1983). The items were pretested on a sample of college students and a sample of community participants from a smoking cessation program. The 10-item PSS consists of 10 items with the highest factor loadings from the original 14-item PSS. Items 4, 5, 12, and 13 of the PSS-14 were deleted from the original 14-item scale to make the 10-item scale (Cohen & Williamson, 1988).

Relative to construct validity, principal component factor analysis revealed a one-factor structure for the PSS in a sample of 2,387 individuals from a U.S. probability sample (Cohen & Williamson, 1988). Roberti, Harrington, and Storch (2006) found a two-factor structure via exploratory factor analysis for the PSS-10 in a sample of 285 undergraduate college students, the majority of whom were women ($N = 255$). Mitchell, Crane, and Kim (2008) found a unidimensional structure for the PSS-10 via exploratory factor analysis in a sample of 60 survivors of suicide. Confirmatory factor analysis showed that all factor loadings were high on their specific factor, and all factor loadings were important in a sample 517 minority students, thus providing confirmation of construct and convergent validity in this sample (Nguyen-Rodriguez, Chou, Unger & Spruijt-Metz, 2008).

Cohen and Williamson (1988) provided evidence of concurrent validity when scores on the PSS-10 items were positively correlated with reports of current stress

($r = .39, p < .001$), negative life events ($r = -.27, p < .001$), and negatively correlated with numbers of hours per week worked ($r = -.11, p < .001$) in a probability sample of 2,387 U.S. adults. PSS-10 item scores were also negatively correlated with perceived health status ($r = -.23, p < .0001$), frequency of exercise ($r = -.06, p < .003$), and positively correlated with health services utilization ($r = .21, p < .0001$), number of serious illnesses ($r = .15, p < .0001$), serious symptoms of illness ($r = .14, p < .0001$), life dissatisfaction ($r = .47, p < .0001$), amount of alcohol use ($r = .10, p < .0001$), and drug use ($r = .17, p < .001$). Roberti et al. (2006) offered evidence of concurrent validity when scores on the PSS-10 correlated strongly with measures of anxiety ($r = .59, p < .001$), depression ($r = .72, p < .001$), and locus of control ($r = .20, p < .001$) in a sample of 285 undergraduate college students. Discriminant validity was shown when the PSS-10 did not substantially correlate with measures of religious faith, sensation seeking, and aggression ($p > .05$). Mitchell et al. (2008) provided evidence of convergent validity when scores on the PSS-10 were moderately and positively correlated with other measures of stress ($r = .54, p < .01$), posttraumatic stress ($r = .69, p < .05$), and the PSS-14 ($r = .98, p < .05$) and PSS-4 ($r = .95, p < .05$), and negatively correlated with measures of mental health functioning ($r = -.70, p < .05$), and physical health ($r = -.21, p < .05$) in a sample of 60 adult survivors of suicide. Known-groups comparisons revealed that minorities scored significantly higher on the PSS-10 than those identified as White.

Relative to reliability, Cohen and Williamson (1988) reported a coefficient alpha of .78 for the PSS-10 in a probability sample of 2,387 U.S. adults. Mathews et al. (2006) reported a coefficient alpha of .90 for the PSS-10 in a sample of 155 healthy women. Orucu and Demir (2009) reported a Cronbach's alpha reliability coefficient of 0.84 for

the PSS-10 in a sample of 508 Turkish university students. Gonzalez-Ramirez and Hernandez (2007) reported a coefficient alpha of .83 for the PSS-10 in a probability sample of 365 Mexican university psychology students.

Demographic Data Sheet

A demographic data sheet (see Appendix F) was constructed to gather information about the characteristics of the participants including age, grade in high school, ethnicity, country of birth, parents and grandparents countries of birth. Several questions were added to obtain relevant information such as current health status, perception of current weight, participation in school or organized sports, hours spent watching television or on the Internet, and the number of times spent eating out at fast food restaurants during a given week.

Procedure for Data Collection

The study was conducted in a senior high school located in a large urban school district in central New Jersey. The school has approximately 1360 students in grades 9 through 12, with 286 of these students being Hispanic female, from which the sample was accessed. Written permission was obtained from the school district superintendent and school principals to conduct the study (see Appendix G). Prior to data collection, approval to carry out the study was obtained from the Institutional Review Board (IRB) of Rutgers, the State University of New Jersey.

Prior to conducting the study, the researcher met with the participating school principal, vice principal, health education teacher, and school nurse to discuss the study and procedures for data collection. The vice principal provided the researcher with dates

and times for the researcher to attend classes and lunch periods to meet with the students to explain the purpose of the study, the procedures, rights of human subjects, and the need for student and parental consent for student participation. Students who were 18 years of age and older were able to sign their own consent form (see Appendix H) without the need for their parent or guardian's permission. Students who were 14 to 17 years of age were given packets to take home to their parent or guardian which included a letter explaining the study, contact information for the researcher, student assent form, and parental consent form (see Appendix H), to be returned prior to the day the students filled out the study questionnaires. The researcher answered any student or parent questions relative to the study and informed consent. Faculty members and the school nurse were asked to collect the parental consent forms and lock them in a file with a list of student names of consenting parents if the principal researcher was not at school on the date of consent return.

At a designated date and time, the researcher was assigned a private location in the nurse's suite to administer the instrument packets, which took about 30 minutes to complete. The researcher was given a copy of each student's current semester schedule, and the student was called to the nurse's suite for data collection. Students aged 14-17 years with parental or guardian consent were provided a written student assent form (see Appendix H) prior to administration of the instrument packets. Completed instrument packets were collected by the researcher and her research assistants prior to assessing BMI and waist circumference. IRB certified data collectors assisted the researcher in obtaining data from students in the nurse's suite. The assistants were trained to collect data in the same manner. To protect anonymity, all of the instruments in the packet were

coded with a subject-specific identification number, assigned at the time of consent. Instructions were given to the participating students regarding completion of the forms and the confidentiality of the data. Students were told that they could discontinue participation at any time and that they could ask that their data be removed from the study after they completed and submitted their instrument packets. Upon returning the instrument packets to the researcher, the packets were checked for completeness, the student was given a raffle ticket, and thanked for her participation. This procedure was replicated until the required sample size for the study had been achieved. The researcher was available in the school nurse's office at the end of the day to answer any questions the students may have had about the study.

Height and weight measures were performed on participating students in the nurse's office by the researcher or her trained research assistants. Recorded information included was the name of the examiner, date of the examination, height to the nearest 1/8 inch, and weight to the nearest 1/4 pound as shown in Appendix I.

Description of the Measurement Procedures

The student's height and weight was measured and recorded in a secure location away from other students to avoid any harassment or stigma by others. The students were called in one at a time for these measurements after the completion of the research questionnaires.

Procedure for Weight Measurements

1. Set the scale at zero reading.
 2. The student removed her shoes, heavy outer clothing (jacket, vest, sweater, hat), and empty pockets (cell phones, iPods) to extent possible.
 3. The student stepped on the scale platform, facing away from the scale read out, with both feet on the platform, and remain still with arms hanging naturally at side and looking forward.
 4. The researcher read the weight value to the nearest 1/4 pound or 0.1 (1/10) kilogram.
 5. The student stepped off the scale and a second measurement, repeating the steps above (measurements should agree within 0.1 kilogram or 1/4 pound; if not, re-measure until this standard is met).
 6. For confidentiality and to avoid stigma or harassment, the researcher didn't call out the weight value.
 7. The researcher recorded the weight value immediately on the data log.
- (Bell, 2012)

Height Measurements

1. The student removed her shoes, hat, and hair ornaments /buns,/braids to extent possible.
2. The student stood on the footplate or uncarpeted floor with back against stadiometer rule.
3. The student was instructed to her bring legs together.
4. The researcher assured student's legs are straight, arms are at sides, and shoulders are relaxed.
5. The researcher assured the back of the student's body touches/has contact with the stadiometer at some point, preferably with heels, buttocks, upper back and head touching the measuring surface.
6. The research assured the student's body is in a straight line (mid-axillary line parallel to the stadiometer) (Bell, 2012).

The participating student's height and weight values, together with their age and sex, were entered into a BMI Percentile calculator for child and teen measurements (CDC, 2/6/13, <http://apps.nccd.cdc.gov/dnpabmi/>). A chart containing BMI values for girls between the ages of 2 and 20 years together with the BMI percentile grid was used to

determine the percentile (5th, 10th, 25th, 50th, 75th, 85th, or 95th) in which the BMI measurement fell (see Appendix A).

Waist Circumference

Waist circumference was measured to the nearest centimeter with a flexible steel tape measure, at the end of gentle expiration, while the subjects were in a standing position. The following anatomical landmarks were used: laterally- midway between the lowest portion of the rib cage and iliac crest, and anteriorly, midway between the xiphoid process of the sternum and the umbilicus (Lohman, 1986). The final measurement was the average of two separate measurements.

Plan for Data Analysis

Data were analyzed using descriptive statistics to describe the study variables and the demographic characteristics of the sample. Reliabilities of the study instruments were assessed using coefficient alpha. Pearson/Product-Moment correlation coefficients and linear regression were used to examine the hypothesized relationship using SPSS (version 21.0) statistics software. Scatterplots, frequency tables, and histograms were used to assess distribution of study variables for normality. Tests for skewness and kurtosis were conducted and data were reviewed for inconsistencies, outliers, and wild data entry codes.

Hypotheses 1-7 were tested using Pearson Product-Moment coefficients. Hypothesis 8 was tested using a series of the regression equations to determine the extent to which familism accounts for the relationship between acculturation and obesity. As indicated by Barron and Kenny (1986), the following three regression equations were to

be tested: first, regressing the mediator, familism, on the independent variable, acculturation; second, regressing the dependent variable, obesity, on the mediator, familism; and third, regressing the dependent variable obesity, on both the independent variable acculturation, and the mediator familism. According to Barron and Kenny (1986), to establish mediation, the following conditions must hold: first, the independent variable, acculturation, must affect the mediator, familism, in the first equation; second, the independent variable, acculturation, must be shown to affect the dependent variable, obesity, in the second equation; and third, the mediator, familism, must affect the dependent variable, obesity, in the third equation. If these conditions all hold in the predicted direction, then the effect of the independent variable, acculturation, on the dependent variable, obesity, must be less in the third equation than in the second. Perfect mediation holds if the independent variable, acculturation, has no effect when the mediator, familism, is controlled. Partial mediation holds when the third equation is considerably less than the second equation in its statistical significance.

Hypothesis 9 used a moderation model (Baron & Kenny, 1986) tested by linear regression to determine if familism affects the direction and/or strength of the relationship between perceived neighborhood disorder and obesity. According to Baron and Kenny it is desirable that the moderator, familism, be uncorrelated with the predictor, neighborhood disorder and the dependent variable, obesity. Moderation is shown if the interaction between the independent variable, neighborhood disorder and the moderator, familism, is significant with or without significant effects for the independent variable, neighborhood disorder on obesity.

Human Subjects Protection

This study was submitted to the Institutional Review Board (IRB) of Rutgers, The State University of New Jersey to protect the rights of human subjects participating in the study. There were no anticipated risks to subjects participating in the study. An expedited IRB review was requested, as participants in the study were only required to complete questionnaires and body measurements (height, weight, and WC). Participants' responses to questionnaire items were anonymous in that there were no documents or identifiers linking participants' email, mailing address, phone numbers, or identities to their responses. The PI maintained completed questionnaires in computer files that were password protected and only the PI had access to the password. Computer files were backed up onto a flash drive and the flash drive was maintained in a locked cabinet. Data collected from this study will be reported only as grouped data and no participants will be identified by name. The flash drive will be destroyed three years after completion of the research study.

Chapter IV

Analysis of the Data

The purpose of this study was to examine the relationship between the independent variables of: acculturation, perceived neighborhood disorder, perceived stress, and familism on obesity (WC and BMI percentile) among adolescent Hispanic females. Data were collected from 191 respondents using the Short Acculturation Scale for Hispanic Youth (SASH-Y), Perceived Neighborhood Disorder Scale (PNDS), Attitudinal Familism Scale (AFS), and Perceived Stress Scale (PSS). Also, obesity was measured by calculated BMI and a BMI percentile (BMI) plotted by age to sex specific growth chart, and waist circumference. The analysis of the data and findings obtained are presented in this chapter.

Statistical Descriptions of the Study Variables

The final sample consisted of 169 respondents. Thirty of the respondents originally recruited for the study were deleted due to failure to meet study delimitations as discussed in Chapter 1. Acculturation, as measured by the SASH-Y, had scores that ranged from 14 to 52 ($M=30.7$, $SD=6.8$) indicating that subjects had low to moderate acculturation, with the mean falling near the median value. For the PNDS, which measures perceived neighborhood disorder, the respondent scores ranged from 19 to 59 ($M=34.2$, $SD=7.4$); the subjects represented a wide range of values with the mean falling slightly above the median value. The respondents' total scores on the AFS, which measured attitudinal familism, ranged from 50 to 85 ($M=65.3$, $SD=7.3$) indicating subjects had moderately strong familism with subject values in the upper range with the mean falling near the median value. For the PSS, which measured perceived stress,

respondent scores ranged from 6 to 34 ($M=20.7$, $SD=5.1$), indicating that subjects represented a wide range of values with the mean falling near the median value on the PSS. BMI, which is a formula used to measure the dependent variable of obesity converted to percentile, ranged from 1 to 99 percent ($M=71.39$, $SD=25.87$). Also, waist circumference, which was another dimension of the dependent variable of obesity, ranged from 20 to 53.0 ($M=31.3$, $SD=5.9$) indicating a wide range of values with higher values somewhat above the mean. All of the study variables reflected satisfactory normality except waist circumference with a slightly skew value of 1.33 and kurtosis value of 1.89. Tabachnick and Fidel (2007) state that in a large sample, statistically significant skew values, which represent minor deviations from normality often, do not make a substantive difference in the analysis. Kline (2005) states that variables with absolute values of skew index greater than 3.0 can be described as extremely skewed and absolute values of the kurtosis index from 8.0 to 20.0 indicate extreme kurtosis. Such values need to be transformed, while lesser deviations from normal do not necessarily require transformation. The descriptive statistics for the aforementioned tools are summarized in Table 3. Thus, it was found that these Hispanic females approached overweight and fell into the overweight category based on their waist circumference and therefore are at increased risks for obesogenic diseases such as hypertension, Type 2 diabetes, and high cholesterol based on their waist circumference (Chen et al., 1994). On average, these adolescent females displayed a moderate level of attitudinal familism, acculturation, perceived neighborhood disorder, and perceived stress.

Table 3. *Descriptive Statistics for Study Variables*

Variables	M	Median	SD	Range	
				Potential	Actual
% Body Mass Index (lbs/in ² x 703)	71.39	78.00	25.87	1-100	1-99
Waist Circumference (in.)	31.25	29.00	5.87	---	20-53
Attitudinal Familism Scale	65.30	65.00	7.34	18-90	50-85
Short Acculturation Scale for Hispanic Youth	30.73	31.00	6.78	12-60	14-52
Perceived Neighborhood Disorder Scale	34.16	33.00	7.43	15-60	19-59
Perceived Stress Scale	20.72	21.00	5.08	0-40	6-34

Psychometric Properties of the Instruments

All of the instruments used in the study demonstrated coefficient alphas higher than .70 for internal consistency, according to Nunnally and Bernstein (1994) is the minimally acceptable level for instrument reliability. The PNDS had a coefficient alpha of .89, which is comparable to that reported by Ross and Mirowsky (1999) ($\alpha = .916$) in a sample of Chicago adults. The PSS had a coefficient alpha of .71, which was lower than (.89) that was reported by Nguyen-Rodriguez, Chou, Unger, and Spruijt-Metz (2008) in a sample of minority students ($\alpha = .89$), and ($\alpha = .86$) reported by Martin, Kazarian, and Breiter (1994) in a group of adolescent psychiatric patients. The SASH-Y had a coefficient alpha of .84, which is slightly lower than the reliability reported by Barona and Miller (1994) among Hispanic youths ($\alpha = .92$). A coefficient alpha of .77 was obtained for the AFS which was lower than the reliability reported by Steidel and Contreras (2003) in a sample of Latino adults ($\alpha = .83$), as well as ($\alpha = .88$) reported by

Austin, Smith, Gianini, and Campos-Melady in a sample of Mexican-American women, and that reported by Schwartz (2007) in a sample of young adults ($\alpha = .83$). Differences in alpha coefficients among the present study and other studies may be influenced by the particular Hispanic subcultures used in the analysis. The coefficient alphas for each scale are presented in Table 4.

Table 4. *Coefficient Alpha Reliabilities for the Study Variables*

Instrument	Coefficient Alpha
Attitudinal Familism Scale (AFS)	.77
Short Acculturation Scale for Hispanic Youth (SASH-Y)	.84
Perceived Neighborhood Disorder Scale (PNDS)	.89
Perceived Stress Scale (PSS)	.71

Data Analysis

Using Statistical Package for the Social Sciences, version 21 (SPSS IBM, New York, U.S.A.), descriptive statistics were obtained to describe the study variables and the demographic characteristics of the sample. Pearson Product Moment Correlation coefficients were assessed among the study variables. The inter-correlation matrix is presented in Table 5.

Table 5. *Inter-correlation Matrix for the Study Variables*

Variables	Waist Circum- ference (in.)	Body Mass Index (lbs/in ² , x 703)	Short Acculturation Scale for Hispanic Youth	Perceived Neighbor- hood Disorder Scale	Perceived Stress Scale	Attitudin al Familism Scale
Waist Circumferenc e (in.)	1.00					
% Body Mass Index (lbs/in ² , x 703)	.71**	1.00				
Short Acculturation Scale for Hispanic Youth	.06	.07	1.00			
Perceived Neighborhood Distress Scale	.01	.15*	.10	1.00		
Perceived Stress Scale	.11	.13*	.39**	.13*	1.00	
Attitudinal Familism Scale	-.05	-.09	.07	-.12	-.05	1.00

* $p < .05$, ** $p < .01$ (1-tailed).

Hypothesis Testing

Hypothesis 1

Hypothesis 1 stated there is a positive relationship between acculturation and obesity (waist circumference and BMI for age percentile). The Pearson Product-Moment correlations testing the relationship between acculturation and waist circumference ($r = .06, p = .21$) and between acculturation and body mass index percentile ($r = .07, p = .20$) were not statistically significant. Thus, Hypothesis 1 was not supported.

Hypothesis 2

Hypothesis 2 stated there is a positive relationship between perceived neighborhood disorder and obesity (WC and BMI for age percentile). The Pearson Product-Moment correlation testing the relationship between waist circumference and perceived neighborhood disorder was not statistically significant ($r = .01, p = .47$). However, the Pearson Product-Moment correlation testing the relationship between perceived neighborhood disorder and BMI percentile was statistically significant ($r = .15, p = .03$). Thus, Hypothesis 2 was partially supported.

Hypothesis 3

Hypothesis 3 stated there is a negative relationship between familism and obesity (WC and BMI for age percentile). The Pearson Product-Moment correlations testing the relationships between familism and waist circumference ($r = -.05, p = .27$) and between familism and BMI percentile ($r = -.09, p = .12$) were not statistically significant. Thus, Hypothesis 3 was not supported.

Hypothesis 4

Hypothesis 4 stated there is a positive relationship between perceived stress and obesity (WC and BMI for age percentile). The Pearson Product-Moment correlation testing the relationship between waist circumference and perceived stress ($r = .11, p = .08$) was not statistically significant. However, the Pearson Product-Moment correlation testing the relationship between perceived stress and BMI percentile was statistically significant ($r = .13, p = .05$). Thus, Hypothesis 4 was partially supported.

Hypothesis 5

Hypothesis 5 stated there is a negative relationship between acculturation and familism. The Pearson Product-Moment correlation testing the relationship between acculturation and familism was not statistically significant ($r = -.07, p = .18$). Thus, Hypothesis 5 was not supported.

Hypothesis 6

Hypothesis 6 stated there is a positive relationship between acculturation and perceived stress. The Pearson Product-Moment correlation testing the relationship between acculturation and perceived stress was statistically significant ($r = .39, p < .01$). Thus, Hypothesis 6 was supported.

Hypothesis 7

Hypothesis 7 stated there is a positive relationship between perceived neighborhood disorder and perceived stress. The Pearson Product-Moment correlation testing the relationship between perceived neighborhood disorder and perceived stress was statistically significant ($r = .13, p = .05$). Thus, Hypothesis 7 was supported.

Hypothesis 8

Hypothesis 8 stated when familism is controlled for statistically, the relationship between acculturation and obesity (WC and BMI for age percentile) will diminish. Three regression equations as indicated by Baron and Kenny (1986) were used to test the mediation model. Accordingly, the first equation regressed familism (the mediator variable) on acculturation (the independent variable). The second equation regressed obesity (the dependent variable) on acculturation (the independent variable). The third equation regressed obesity (the dependent variable) on both acculturation (the independent variable) and familism (the mediator variable). Baron and Kenny (1986) states to determine mediation these three circumstances must hold: (1) the independent variable (acculturation) must affect the mediator variable (familism) in the first equation; (2) the independent variable (acculturation) must be shown to affect the dependent variable (obesity) in the second equation; and (3) the mediator (familism) must affect the dependent variable (obesity) in the third equation. However, because the aforementioned variables were not significantly correlated, the assumptions of this test were not met. Thus, Hypothesis 8 was not tested and was therefore, not supported.

Hypothesis 9

Hypothesis 9 stated that familism would moderate the relationship between perceived neighborhood disorder and obesity (WC and BMI for age percentile).

According to Baron and Kenny (1986) the moderation model has three causal paths that leads into an outcome variable: (Path a) the impact of the independent variable, perceived neighborhood disorder, as a predictor of obesity, (Path b) the impact of the moderator, familism, on obesity, and (Path c) the interaction or result of these two variables (perceived neighborhood disorder and familism) on obesity. The hypothesized moderation model is supported if the interaction between (Path c) perceived neighborhood disorder and familism is significant. The results of the multiple regression analysis were not statistically significantly ($R^2 = .003$, adjusted $R^2 = -.015$, $F(165) = .157$, $p = .925$). Similarly, the regression equation with perceived neighborhood disorder was not significantly related to BMI ($R^2 = .034$, adjusted $R^2 = .016$, $F(165) = .130$, $p = .130$). The non-significant (ns) unstandardized Beta coefficients for the two regression models are shown in Figure 2a and Figure 2b. Thus, Hypothesis 9 was not supported.

Figure 2a: *Familism moderation model for Waist Circumference.*

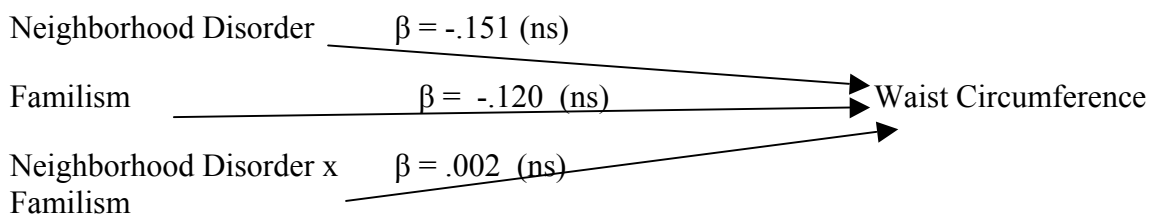
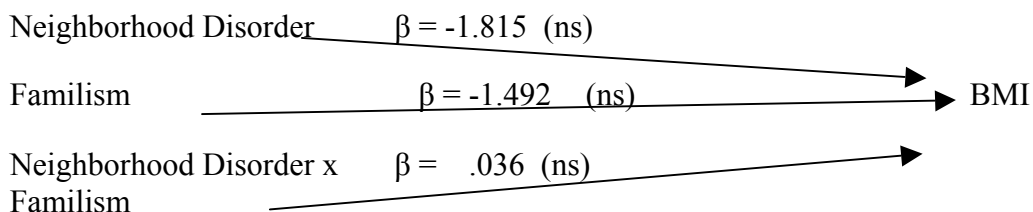


Figure 2b: *Familism moderation model for percent BMI*

Additional Findings

There were significant differences in responses for some of the study variables according to the respondents' birthplace (U.S. or non-U.S.) and language spoken in the home (Spanish only or both Spanish and English). Respondents born in the U.S. reported significantly higher scores for acculturation levels than non-U.S. born respondents ($t = 4.33, p < .001$), U.S.A. ($M = 32.89, SD = 6.56$) vs. non-U.S. ($M = 28.60, SD = 6.33$). Additionally, respondents born in the U.S. reported significantly higher scores for perceived neighborhood disorder than non-U.S. born respondents ($t = 2.10, p = .04$), U.S. ($M = 35.36, SD = 7.37$) vs. non-U.S. ($M = 32.98, SD = 7.34$). Furthermore, respondents born in U.S. reported significantly higher scores for perceived stress than non-U.S. born respondents ($t = 2.125, p = .035$): U.S. ($M = 21.52, SD = 4.23$) vs. non-U.S. ($M = 19.88, SD = 5.74$).

Acculturation scores were significantly different with regard to language spoken in the home. ($t = -7.135, p < .001$); acculturation scores were greater among respondents living in homes where both Spanish and English were spoken ($M = 32.52, SD = 6.14$) than English only ($M = 24.77, SD = 5.27$). Additionally, perceived stress was reportedly significantly greater among respondents living in homes where both Spanish

and English were spoken than Spanish only ($t = -2.065, p < .040$). Perceived neighborhood disorder was greater among respondents living in homes where both Spanish and English were spoken ($M = 34.63, SD = 7.18$) than Spanish only ($M = 32.59, SD = 8.11$).

Chapter V

Discussion of the Findings

The purpose of this study was to examine the relationship between the dependent variable obesity and independent variables (a) acculturation, (b), perceived neighborhood disorder (c) perceived stress, and (d) familism on Hispanic adolescent girls. Additionally, the study tested the relationships between acculturation and perceived stress and neighborhood disorder and perceived stress. The study also tested the following model: familism as a moderator in the relationship between the predictor variable perceived neighborhood disorder, and the criterion variable obesity.

Acculturation and Obesity

Hypothesis 1 stated there is a positive relationship between acculturation and obesity (WC and BMI). The relationship between acculturation and obesity was derived from theory that suggests that more acculturated Latinos are likely to engage in undesirable dietary behaviors placing them at risk of obesity (Lara, Gamboa, Kahramanian, Morales, & Bautista, 2005). The testing of hypothesis 1 in this study demonstrated that the hypothesis and proposed theory were not supported; correlation analysis showed that there was a weak and non-significant relationship between acculturation and waist circumference ($r = .06, p > .05$) and acculturation and BMI ($r = .10, p > .05$). The findings of the current study were contradictory to those of Khan, Sobal, and Martorel (1997) who found that BMI was significantly greater for second and third generations of Mexican-American woman; and to those of Creighton, Goldman, Pebley and Chung (2012) who reported the odds of being obese were significantly higher

for immigrants with longer status in the United States. A possible explanation for the findings of the present study is that there are other variables that may contribute to the relationship between acculturation and obesity. For example, in a sample of Hispanic adolescents, Liu, Probst, Harun, Bennett, and Torres (2009) found the prevalence of obesity was greater among adolescents living in homes where English was the secondary language. Khan, Sobal and Martorell (1997) also found that lower BMI was significantly related to English language preference in the home versus Spanish preference in the home. Lind et al. (2012) found that lower levels of acculturation were associated with both positive and negative healthy lifestyle characteristics depending on gender and primary language spoken. In their study, Creighton, Goldman, Pebley and Chung (2012) determined that although there were less healthy dietary behaviors among native-born Mexicans, the odds of being obese were significantly higher among those who lived in the United States more than 15 years. Thus, primary language in the home, gender, and years lived in the United States may impact both acculturation and obesity. Similar to the findings of the present study, Gordon-Larsen, Harris, Ward, and, Popkin (2003) found no statistically significant relationship between acculturation and being overweight. However, they did find that overweight prevalence was higher, (although not statistically significant) among U.S. born versus non-U.S. born immigrants, with the exception of Mexicans who have a greater prevalence of being overweight with length of time living in the United States. Similarly, Khan, Sobal and Martorell (1997) found that acculturation was strongly related to BMI among Mexican Americans when compared to other Hispanic groups. As countries in the western hemisphere progress through the stages of nutrition transition, we may find that more immigrants from Latin America will

arrive in the US already overweight or obese, while weight gain among individuals in the US may begin to slow down (Popkin, 2010). In conclusion, variables such as primary language spoken in the home, country of origin, and gender may affect the relationship between acculturation and obesity in Hispanic populations. More research is needed to determine the relationship between acculturation and obesity in adolescent Hispanic girls.

Perceived Neighborhood Disorder and Obesity

Hypothesis 2 stated that there is a positive relationship between perceived neighborhood disorder and obesity (WC and BMI). The relationship between perceived neighborhood disorder and obesity was derived from theory that proposed neighborhood disorder impacts nutrition and obesity (Krieger & Higgins, 2002). McEwen (2001) posited that the social and physical environment influences BMI and WC, variables in AL. McEwen and Seeman (1999) suggested that neighborhood disorder is related to poor outcomes such as obesity. The Pearson Product-Moment correlation testing the relationship between WC and neighborhood disorder was not statistically significant. However, the Pearson Product-Moment correlation testing the relationship between neighborhood disorder and BMI percentile for age and sex was statistically significant. Thus, Hypothesis 2 was partially supported.

The findings in the present study relative to the relationship of obesity, as measured by BMI, and neighborhood disorder are supported by other studies. Boehmer, Hoehner, Deshpande, Ramirez and Brownson (2007) found that quality of the neighborhood was significantly associated with obesity, defined by a BMI of at or greater than 30 kg/m², in a sample of adults. Burdette and Hill (2008) found that neighborhood

disorder was significantly related to an increased risk of obesity, as measured by BMI, in a sample of community dwelling adults. Evenson, Scott, Cohen and Voorhees (2007) found neighborhoods with less crime; access to physical activity facilities were associated with lower BMIs in a sample of young adolescent girls. Also, Chen and Wen (2010) found that neighborhood disorder was positively associated with BMI in a sample of multiracial adolescents. Franzini, Elliott, Cuccaro, et al (2009) found that adolescents who perceived higher neighborhood safety had increased physical activity, and a decreased rate of obesity, as defined by a BMI above the 95th percentile. Merten's (2010) study of adolescents found that community disadvantage significantly predicted adolescent obesity, as measured by BMI exceeding the 95th percentile. The aforementioned studies used BMI as a measure of obesity and found that neighborhood disorder and low physical activity increased the risk for obesity in adults and adolescents.

The correlation testing the relationship between waist circumference and neighborhood disorder was not statistically significant. This finding is contrary to that of Ewart, Elder, and Smyth (2014) who found that neighborhood disorder was positively associated with BMI and WC in a sample of ninth graders. A possible explanation for the lack of significance may be the use of WC to measure obesity in adolescents. Although obesity, particularly truncal obesity, is the most visible sign of increased AL truncal obesity occurs over time with repeated exposure to psychosocial or physical stressors and is accompanied by a sustained release of catecholamines and cortisol, resulting in the deposition of fat in the abdomen Björntorp (2001). However, in their intergraded review of the relationship of biomarkers in AL and child and adolescent obesity, Barkin, Rao, Smith and Poe (2012) found that biomarkers related to obesity in

adults, including waist to hip ratio, were not related to growth patterns in children and adolescents. Lubans, Morgan, Aguiar, and Callister (2011) in their randomized controlled trial of a physical activity intervention among 120 adolescents from disadvantaged neighborhoods in Australia, found that although there were differences in BMI between those adolescents in the physical intervention group as compared to the control group, there was no difference between the two groups in WC. Another possible explanation for the findings in the present study is that there may be gender differences in WC. Mirkopoulou et al. (2010) in their study of adolescents, aged 17, found that boys had an increased risk of abdominal obesity when compared to adolescent girls (OR: 1.405, CI: 0.7-2.8). Given the role of estrogen in the establishment of gynoid fat deposits in women of childbearing age, this finding makes sense. The study results reveal more research is needed to determine the role of truncal obesity in increased AL among Hispanic adolescent females.

Familism and Obesity

Hypothesis 3 stated that there is a negative relationship between familism and obesity (WC and BMI percentile for age and gender). The relationship between familism and obesity originated from theory that proposed that familism might make it more difficult to manage weight and nutrition (Sabogal, et. al, 1987). Theory also suggests that familism acts as an asset and protective factor in preventing adolescent health problems (Smokowski & Bacallao, 2007; Smokowski, Chapman, & Bacallao, 2007). While the Pearson Product-Moment correlation testing this relationship was negative and in the direction predicted, it was not statistically significant. Thus Hypothesis 3 was not supported. To date, there is limited empirical evidence linking familism and obesity.

Austin, Smith, Gianini, and Campos-Melady (2012) found significant relationships between attitudinal familism and weight management adherence. More research is needed to determine the precise relationship of familism and obesity among adolescent Hispanic girls.

Perceived Stress and Obesity

Hypothesis 4 stated there is a positive relationship between perceived stress and obesity (WC and BMI percentile for age and sex). The relationship between stress and obesity was derived from theory that suggested that stress may cause individuals to take in more calories and engage in less physical activity causing an increase in body weight (McEwen, 2006). Stress causes the release of specific hormones, which in turn results in the deposition of body fat (McEwen & Wingfield, 2003). The Pearson Product-Moment correlation testing the relationship between WC and perceived stress was not statistically significant. However, the Pearson Product-Moment correlation testing the relationship between perceived stress and BMI percentile for age and sex was statistically significant. Thus, Hypothesis 4 was supported when testing BMI with perceived stress. The findings in the present study were contrary to the findings of Jaarsveld, Fidler, Stephoe, Foniface, and Wardle (2009) who found a positive relationship between perceived stress and WC in a sample of multiracial adolescents. Other measures of stress may be related to obesity such as cortisol levels. Farag et al. (2008) found that WC was significantly related to cortisol level in over-weight women. Epel et al., (2000) found that reactive cortisol level was positively related to waist hip ratio in adult woman. There are few empirical studies that support the relationship between obesity and perceived stress in adolescents.

Therefore, stress may not be the only variable contributing to the adolescents' weight. In

this study, eating habits or physical activity was not assessed, so there was no control for those variables to focus exclusively on stress as a cause for obesity. Perhaps stress was not the only reason for the student's weight. Also, as a group, mean BMI percentiles for age and sex were moderately high (78th percentile). This suggests there are other factors, which may affect obesity in this group, especially diet and exercise.

Acculturation and Familism

Hypothesis 5 stated there is a negative relationship between acculturation and familism. Hypothesis 5 was derived from theory that suggested that cultural values, such as familism, slow the rate of acculturation (Romero, Robinson, Haydel, Mendoza, & Killen, 2004) and that highly acculturated individual have lower adherence to familism (Steidel & Contreas, 2003). It was also posited that familism changes because of urbanization and acculturation (Garza & Gallegos, 1985). Although the Pearson Product-Moment correlation testing the relationship between acculturation and familism was negative, it was not statistically significant. Thus Hypothesis 5 was not supported.

These findings contradict the results obtained by Sobogal et al. (1987), who studied the effects of acculturation on attitudinal familism amongst 452 Hispanic and 227 white non-Hispanic subjects. The results from that study showed a significant contribution to the familism dimensions due to acculturation. The less acculturated participants reported higher levels in the dimension of Familial Obligation ($M=4.44$; $F(1,399) = 51.15, p < .001$) and Family as Referents ($M=3.41$; $F(1,403) = 41.90, p < .001$) than the highly acculturated individuals ($M=3.97$ and $M=2.79$ respectively). In the present study, although the strength of the correlation was statistically insignificant, the direction of the relationship was negative, as hypothesized. Although the subjects

were all broadly categorized as Hispanic/Latino, participants were first and second generation immigrants from twelve different Latin American countries. It is possible that the concept of familism is expressed differently or is not as strongly endorsed throughout Latin America (Riveria et al. 2008). Additional research is needed to examine the nature of the relationship between acculturation and familism among diverse subgroups of Hispanic adolescents.

Acculturation and Perceived Stress

Hypothesis 6 stated that there is a positive relationship between acculturation and perceived stress. Hypothesis 6 was derived from theory that suggests that acculturation may lead to psychological symptoms and stress (Green et al. 2010). Mangold, Wand, Javoros and Mintz (2010) posited that acculturation is linked to cortisol awakening responses, a physiological stress indicator. The Pearson Product-Moment correlation testing this relationship was statistically significant and in the direction hypothesized. Thus Hypothesis 6 was supported. This finding is congruent with the results obtained by Mangold, Wand, Javoros, and Mintz (2010), who reported a significant relationship between acculturation and cortisol awakening response, an indicator of stress in Mexican-American adults. These findings suggest the assumption that with increased acculturation levels, stress should decrease with length of time in the host country does not appear to hold true. Desjarlais, Eisenberg, Good, and Kleinman (1995) have indicated there are many different sets of circumstances under which immigrants are likely to experience stress and these can occur over the course of many years following immigration. It may well be that immigrants who do not attain higher levels of

socioeconomic success through immigration are more likely to continue to experience high levels of stress over a longer period of time (D'Alonzo, Johnson & Fanfan, 2012).

Perceived Neighborhood Disorder and Perceived Stress

Hypothesis 7 stated there is a positive relationship between perceived neighborhood disorder and perceived stress. The hypothesis was based on theory that suggested stress may be an outcome of neighborhood disorder (Hill, Ross, and Angel, 2005; McEwen, 2000). The Pearson Product-Moment correlation testing the relationship between perceived neighborhood disorder and perceived stress was statistically significant ($r = .13, p = .05$). Thus Hypothesis 7 was supported. The findings of the present study are in agreement with those of (Hill, Ross, and Angel, 2005) who found that residents who reported neighborhood disorder had higher stress levels than those living in neighborhoods with lower of disorders. Burdett, and Hill (2008) also found that neighborhood disorder was positively related to psychological stress in adults. The results of this study indicate that stress related to the safety and accessibility of one's neighborhood is not limited to adults, but is a factor for adolescents as well.

Acculturation, Familism, and Obesity

Hypothesis 8 stated when familism is controlled for statistically, the relationship between acculturation and obesity (WC and BMI) will diminish. Hypothesis 8 was derived from theory that suggests that as Latino acculturation increases, familism decreases (Rodriguez & Kosloski, 1998) and that familism may make it more difficult to manage weight and nutrition (Sabogal, et al, 1987). Because the variables acculturation,

familism, and obesity were not significantly correlated, Baron and Kenny's (1986) assumptions for mediation were not met. This, the hypothesis was not tested.

The results of this study contradicted the findings of Austin, Smith, Gianini and Campos-Melady (2012), who studied the relationship between attitudinal familism, calorie, and physical activity goal completion among 100 Mexican American women. The results demonstrated that familism was negatively correlated with total study weight loss from intake to post-treatment, $r(58) = -0.30, p < 0.05 (d = -0.63)$. In addition, research has supported the relationship between familism and weight management (Austin, Smith, Gianini & Campos-Melady, 2012). Relative to the relationship between acculturation and familism, Sobogal et al. (1987) found a significant contribution to familism dimensions due to acculturation in a sample of 452 Hispanics.

One explanation for the results in the present study may be that there are other variables that were not investigated in the present study that may contribute to the relationships between familism and obesity and familism and acculturation. Smokovski, Rose, and Bacallao, (2008) in their study of 402 Latino adolescent-parent pairs living in North Carolina and Arizona, found that culture of origin was significantly related to familism ($b = .15, SD = 0.03, \beta = .12, p < .01$). They also found that acculturation conflict significantly predicted familism in Mexican Americans ($b = -.09, SD = 0.02, \beta = .17, p < .001$). Gil, Wagner, and Vega (2000) found that acculturation was negatively related to familism in a sample of immigrant ($N=1051$) and U.S. born ($N=968$) Latino adolescents. That is, they found that individuals who were more acculturated had increased acculturation stress leading to less strong feelings about familism.

In an effort to investigate whether levels of acculturation impacted familism and obesity, a post-hoc analysis of the data was done. The 169 subjects were grouped according to 25, 50, and 75th percentile acculturation score in order to determine the relationship between familism and obesity. Subjects who fell into the 75th percentile group had the following correlations: BMI and familism $r = -.215, p = .061$; percent BMI and familism $r = -.204, p = .075$; WC and familism $r = .191, p = .095$. Those who fell into the 25 and 50 percentile data had very insignificant correlations. Therefore, results from testing familism and obesity based on birth in the U.S. vs non-U.S. birthplace revealed no significant correlations. The results suggested that in the presence of higher acculturation scores the relationship between familism and obesity increases.

More evidence is needed to test the relationships between familism and obesity and acculturation and obesity, acculturation and familism, obesity and familism along with other variables in samples of adolescent Hispanic girls.

Familism, Neighborhood Disorder, and Obesity

Hypothesis 9 stated that familism would moderate the relationship between perceived neighborhood disorder and obesity (WC and BMI percentile for age and sex). The hypothesis was derived from theory that suggest that family practices may moderate the relationship between neighborhood disorder and negative development outcomes in children, and that family support is a buffer against the negative effects of neighborhood disorder (Roosa et al., 2003; Schofield et al. 2012). The hypothesized moderation model was not supported because the interaction between (Path c) perceived neighborhood disorder and familism was not significant (Baron & Kenny, 1986).

These findings suggest that there may be other variables that moderate or mediate the relationship between neighborhood disorder and obesity. Burdette and Hill (2008) studied the relationship between perceived neighborhood disorder and obesity, and psychological, physiological, and behavioral variables that mediate the relationship in a sample of community-dwelling adults. The results demonstrated that neighborhood disorder was associated with increased risk of obesity, and was mediated by psychological distress ($z = 2.14, p < .05$). Also, there was a positive association between psychological stress and obesity that was mediated by physiological distress and poor diet quality ($z = 4.67, p < .001$). Franzini, Elliott, Cuccaro, et al (2009), examined the mediating effect of physical activity on the relationship between physical and social neighborhood environment and obesity in a population of 650 fifth grade students and one of their primary caregivers. The findings showed that physical activity mediated the relationship between social neighborhood environment, consisting of measures of collective efficacy, socialization of children, exchange/collective action among neighbors, ties and safety, and obesity. In order to clarify the strength of the relationship between neighborhood disorder and obesity among Hispanic adolescents, additional research is needed, which includes measures of physical activity and food intake.

Additional Findings

There were significant differences among numerous study variables such as acculturation, perceived neighborhood disorder, and perceived stress with regard to birthplace (U.S. or non-U.S.) and language spoken in the home (Spanish only or both Spanish and English). Respondents born in U.S. reported significantly higher scores for acculturation levels than non-U.S. respondents. These findings are consistent with the

present literature that states greater length of residence in the United States is likely to be associated with increased acculturation, including the acceptance of positive and negative aspects of the current country (Zea, Asner, Birman & Buki 2003; Kaplan, Huguret, Newsom, Bentson, & McFarland, 2004). Furthermore, respondents born in the U.S. reported significantly higher scores for perceived stress than non-U.S. born respondents. This finding is very interesting, because there are no empirical studies that examine levels of perceived stress of U.S. born versus non-U.S.-born adolescents. The examination of the current findings in this study may be very important in identifying specific stressors in the Hispanic/Latino culture and addressing the ways in which subgroups of Latinos deal with stress. One interesting area of study may address stress-eating patterns among Hispanic women born in and outside the US.

Acculturation scores differed significantly with regard to language spoken in the home (Spanish only or both Spanish and English) ($t = -7.135, p = < .001$). As would be expected, acculturation scores were higher among respondents living in homes where both Spanish and English was spoken ($M = 32.52, S.D. = 6.14$) than those where Spanish only is spoken ($M = 24.77, S.D. = 5.27$). Wallen, Feldman, and Anliker (2002) reported a strong relationship between language acquisition and acculturation. The findings of this study are in contrast to those reported by Khan, Sobal, and Mortorell (1997), who evaluated language preference and generational status among Mexican immigrants. The authors discovered that an increasing preference for speaking Spanish signified a lower level of acculturation and was linked with higher levels of BMI. Additionally, perceived stress was reportedly significantly greater among respondents living in homes where both Spanish and English were spoken than Spanish only ($t = -2.065, p < .040$). According to

Cervantes, Padilla, Napper and Goldbach, (2013) Hispanic adolescents born in this country, fluent in English and Spanish, and accustomed to the American culture often function as cultural and linguistic representatives for immigrant parents and other extended family members, thus increasing their stress levels. Also, depending on generational status, Hispanic adolescents vary in terms of the number and the type of stressor events they experience (Cervantes, Padilla, Napper & Goldbach, 2013).

Perceived neighborhood disorder was greater among respondents living in homes where both Spanish and English were spoken ($M = 34.63$, $S.D. = 67.18$) than Spanish only ($M = 32.59$, $S.D. = 8.11$). McLoyd (1998) found a higher proportion of ethnic minority youth live in disadvantaged neighborhoods, compared to there European American counterparts. Ramos, Jaccard and Guilamo-Ramos (2003) found that environmental and social conditions of ethnic minorities predisposed them to more internalizing symptoms as a result of poor surroundings and social disadvantages, thus this increased their exposure to more stressful life events. These findings support the biobehavioral framework of AL, which posits the genesis of chronic illnesses among disadvantaged minority groups may lie with cumulative exposure to chronic psychological and physiological stressors. The present study findings indicate that additional research is needed to assess the effects of chronic stressors on the health of minority adolescents.

Relating the ecological perspective to the current study, the Bronfenbrenner model proposed that there are many factors at numerous system levels that interact and influences a person's wellbeing and health (Ayon, Marsigila, & Bermudez-Parsai, 2010). Familism is part of the microsystem, where individuals interact with their immediate environment, including family. Perceived stress is conceptualized as part of the

mesosystem whereby the developing person finds him or herself at a particular time of their life. The exosystem includes the social environment individuals find themselves in, which may include neighborhood disorder. Finally, the macrosystem is comprised of culture and subcultures and includes acculturation. According to Hancock (2005), the ecological perspective is well matched to the understanding of fundamental implications that may affect Latino families, as well as strengths correlated with Latino culture.

In conclusion the study of adolescent obesity is complex. There may be mediating and moderating variables that were not examined in the present study, such as, but not limited to, culture of origin, dietary behaviors, and exercise, and immigration generation that contribute to obesity in this population.

Chapter VI

Summary, Conclusions, Implications, and Recommendations

Summary

The purpose of this study was to examine the relationships among the independent variables of: (a) acculturation, (b) perceived neighborhood disorder, (c) perceived stress and (d) familism on obesity among adolescent Hispanic females. Additionally, the study tested the relationships between acculturation and perceived stress and perceived neighborhood disorder and perceived stress. To further examine relationships the study tested a moderation model with the variable of familism as the moderator, the relationship between perceived neighborhood disorder as the independent or predictor variable, and obesity as the dependent or criterion variable.

Obesity is defined in the adolescent population as having a body mass index (BMI) at or above the 95th percentile for age and sex (Singhal, Schwenk, & Kumar, 2007). There is evidence obesity may result from continuous adaptation to chronic or acute life stressors, resulting in the biobehavioral process known as allostatic load (AL). Obesity, particularly truncal obesity, is related to repeated exposure to psychosocial or physical stressors, accompanied by a sustained release of catecholamines and cortisol, resulting in the deposition of fat in the abdomen, thereby leading to obesity (Björntorp, 2001).

Acculturation was defined as the process of cultural and psychological change that follows intercultural contact (Barona & Miller, 1994). Theorists proposed that negative effects of acculturation impact physiologic responses and contributed to unhealthy behaviors, such as poor diet and lack of exercise, leading to obesity (Lara,

Gamboa, Kahramanian, Morales, & Bautista, 2005). Previous research suggested that acculturation was significantly related to risk of obesity and BMI in adolescents and adults (Khan, Sobal & Martorell, 1997; Liu, Probst, Harun, Bennett, & Torres, 2009). Based on theoretical and empirical evidence, acculturation was hypothesized as being directly related to obesity.

Ross and Mirowsky (2001) defined neighborhood disorder as a lack of community control. Neighborhood disorder is described as communities with high rates of crime, vandalism, graffiti, loitering, public drinking, abandoned buildings, drug use, danger, interpersonal conflicts, and other incivilities associated with declining social control (Skogan 1986, 1990; Skogan & Maxfield, 1981). Theorists posited that poor neighborhood quality or neighborhood disorder contributes to poor nutrition and subsequently to obesity, an indicator of increased AL (Krieger & Higgins, 2002; McEwen, 2001). Research evidence supported the relationship between obesity and neighborhood disorder (Boehmer, Hoehner, Deshpande, Ramirez & Brownson, 2007; Burdette & Hill, 2006; Chen & Wen, 2010; Evenson, Scott, Cohen, & Voorhees, 2007; Ewart, Elder, & Smyth, 2014; Fanzini, Elliott, Cuccaro, et al., 2009). The present study tested the relationship between neighborhood disorder and obesity in Hispanic adolescent girls.

Keefe (1979) defined familism as a sense of loyalty and solidarity to the family. Familism has been described as a major and central attribute in the Hispanic/Latino culture with a beneficial effect on the individual and their family (Rodriguez & Kosloski, 1998). Theorists proposed that familism acts as an asset and a protective factor in preventing adolescent health problems (Smokowski & Bacallao, 2007; Smokowski,

Chapman, & Bacallao, 2007). Research has linked obesity to familism (Austin, Smith, Gianini, & Campos-Melady, 2012). Based on theory and some research, this study tested the relationship between familism and obesity.

Perceived stress was defined as the degree to which situations in one's life are appraised as unpredictable, uncontrollable, and overloading (Cohen, Kamarck, & Mermelstein, 1988). Theory suggested that adolescent stress affects weight and contributes to obesity (Mc Ewen & Wingfield, 2003; Sarkar & Mukhipadhyay, 2007). Research demonstrated that there is a positive relationship between perceived stress and obesity in female adolescents (DeVriendt, 2011; Jaarsveld, Fidler, Steptoe, Foniface, & Wardle, 2009), and in adult women (Epel, 2000; Farag, et al., 2008). Based on theory and empirical research findings, this study postulated that there would be a relationship between perceived stress and obesity.

Familism has been linked to acculturation. Theory suggested that maintenance of cultural values, such as; familism slows the rate of acculturation (Romero, Robinson, Haydel, Mendoza & Killen, 2004). Steidel and Contreas (2003) stated that highly acculturated individuals have lower adherence to familism.

Some research has supported the relationship between acculturation and familism (Kaestner, Pearson, Keene, & Geronimus, 2009). In addition, research has supported the relationship between acculturation and obesity (Khan, Sobal & Martorell, 1997; Liu, Probst, Harun, Bennett, & Torres, 2009) and between familism and weight management (Austin, Smith, Gianini & Campos-Melady, 2012). However, the present study did not meet the assumption as set forth by Barron and Kenny (1986) the mediational model to

investigate the extent to which familism mediated the relationship between acculturation and obesity was not tested for in this study.

Perceived neighborhood disorder has been linked to obesity (Krieger & Higgins, 2002; McEwen, 2001). Theorists proposed that familism acts as an asset and a protective factor in preventing adolescent health problems (Smokowski & Bacallao, 2007; Smokowski, Chapman, & Bacallao, 2007). Based on theory, the present study examined the extent to which familism would moderate the relationship between perceived neighborhood disorder and obesity.

The following hypotheses were formulated from the theory and tested in this study:

1. There is a positive relationship between acculturation and obesity (WC and BMI percentile for age and sex).
2. There is a positive relationship between neighborhood disorder and obesity (WC and BMI percentile for age and sex).
3. There is a negative relationship between familism and obesity (WC and BMI percentile for age and sex).
4. There is a positive relationship between perceived stress and obesity (WC and BMI percentile for age and sex).
5. There is a negative relationship between acculturation and familism.
6. There is a positive relationship between acculturation and perceived stress.
7. There is a positive relationship between perceived neighborhood disorder and perceived stress.
8. When familism is controlled for statistically, the relationship between acculturation and obesity (WC and BMI) will diminish.

9. Familism would moderate the relationship between perceived neighborhood disorder and obesity (WC and BMI).

Findings and Conclusion

The final sample consisted of 169 first and second-generation immigrant Hispanic female adolescents between the ages of 14 and 19 years, who attended senior high school. Subjects in the final sample size were 14-19 years of age ($M=16.12$, $SD=1.328$). Of the 169 participants, 18.93% were freshman, 24.85% were sophomores, 31.36% were juniors, and 24.85 % were seniors. Relative to immigration status by generation, 49.7 % of the sample was first generation and 50.3% were second-generation immigrants.

Obesity was assessed by BMI percentile for age and sex, and further assessed by the adolescent's waist circumference. The 169 respondents completed The Short Acculturation Scale for Hispanic Youth (SASH-Y), The Attitudinal Familism Scale (AFS), The Perceived Neighborhood Disorder Scale (PNDS), and The Perceived Stress Scale (PSS). All of the instruments used in this study demonstrated coefficient alphas above .70, which were acceptable levels according to Nunnally and Bernstein, 1994.

Using Statistical Package for the Social Sciences, version 21 (SPSS IBM, New York, U.S.A.), descriptive statistics were obtained to describe the study variables and the demographic characteristics of the sample. Pearson Product Moment Correlation coefficients were assessed among the study variables. Hypothesis 1, which stated that acculturation is positively related to obesity, was not supported. Hypothesis 2, which stated there is a positive relationship between perceived neighborhood disorder and obesity (WC and BMI) was supported when testing BMI with neighborhood disorder

($r = .15, p = .03$). The Pearson Product-Moment correlation testing the relationship between waist circumference and neighborhood disorder was not statistically significant. Hypothesis 3 which stated there is a negative relationship between familism and obesity (WC and percentile of BMI) was not supported. Hypothesis 4, which stated there is a positive relationship between perceived stress and obesity (WC and percentile of BMI) was supported when testing the relationship between perceived stress and BMI ($r = .13, p = .046$). However, the relationship between WC and perceived stress was not statistically significant. Hypothesis 5, which stated there is a negative relationship between acculturation and familism, was not supported. Hypothesis 6, which stated there is a positive relationship between acculturation and perceived stress, was supported ($r = .34, p < .01$). Hypothesis 7, which stated there is a positive relationship between perceived neighborhood disorder and perceived stress, was supported. Hypothesis 8, which stated when familism is controlled for statistically, the relationship between acculturation and obesity (WC and BMI) will diminish could not be tested because the variables were not significantly correlated. Lastly, hypothesis 9, which stated familism, would moderate the relationship between perceived neighborhood disorder and obesity (WC and BMI) was not supported.

In conclusion, 9 hypotheses were tested in this study on a sample of 169 Hispanic adolescent girls. The variables of acculturation and familism were not found to be significantly related to obesity. In this sample, when BMI percentile for age and sex was used as a measure of obesity, neighborhood disorder and perceived stress were significantly related to obesity. However, when waist circumference was used as a measure of obesity, neither neighborhood disorder nor perceived stress was significantly

related to obesity. Furthermore, two variables were significantly related to perceived stress: acculturation and neighborhood disorder. The findings of the present study provide preliminary evidence that perceived neighborhood disorder may contribute to the development of obesity among adolescent Hispanic girls. However, there may be other variables that contribute to the genesis of obesity in this population, such as language spoken in the home and years lived in the United States (Creighton, Goldman, Pebley, & Chung, 2012; Khan, Sobal, & Martorell, 1997). In the present study, subjects were first and second generation immigrants from 12 different Latin American countries. Thus the lack of a homogenous sample of Hispanic females may have impacted the significance of proposed study relationships. Alternative hypotheses can be constructed to test which variables are significantly related to obesity in Hispanic female adolescents.

Limitations

The present study has several limitations that should be considered when interpreting the findings. First, the heterogeneous nature of the sample of Hispanic adolescent females limited the power to detect differences between subgroups of Latinas based on country of origin. The heterogeneous nature of the sample provided support to why it is not fitting to regard all Hispanics/Latinos as a single ethnic entity (Avis & Colvin, 2007; Dunlop, & Chang, 2008; Lara, Gamboa, Kahramanian, Morales, & Bautista, 2005; Tirodkar, Song, & Chang, 2007). Additional studies are needed, which involve larger samples of subgroups of Latinas, representing various countries of origin, with sufficient power for testing between group differences. Second, the measurement of acculturation in this population was completed using a unidimensional tool that focused on spoken language. To assess fully the influence of acculturation on obesity risk, bi-

dimensional or multidimensional measures of acculturation, which includes characteristics such as social networks, approval by one's own group or the majority group, ethnic-cultural identity, and dietary preferences, need to be considered (Singh, Kogan, & Dee, 2007; Singh, Yu, Siahpush, & Kogan, 2008; Yu, Huang, Schwalberg, Overpeck, & Kogan, 2003). Third, this study is a cross-sectional design, thus causality cannot be inferred, nor can the exclusion of confounding variables not measured in this study be discounted. Important confounding variables, which should be controlled for in any study of obesity, include objective measures of food intake and physical activity. Similarly, although there were associations between perceived stress and obesity in this study, no other sources of stress were explicitly assessed beyond perceived neighborhood disorder. Future studies regarding obesity among first and second-generation immigrant adolescents may include measures of acculturation stress, as well as academic or social stressors. Lastly, only two measures of AL, BMI percentile for age and sex and waist circumference, were assessed in this study. Allostatic load is a complex process that reflects information on levels of physiologic activity across a range of important regulatory systems, including the hypothalamic-pituitary-adrenal and sympathetic nervous systems as well as the cardiovascular system and metabolic processes. Assessment of these systems and processes involves a host of biomarkers. Primary mediators (including cortisol, noradrenalin, epinephrine, DHEA) as well as other secondary outcomes (such as blood pressure and glycosylated hemoglobin) should be added to further test the relationship between chronic stress and obesity.

Implications

Limitations notwithstanding, the current study has numerous implications for nursing practice. Research findings suggest there are large and consistent racial and ethnic disparities across the life course with regards to health outcomes such as obesity (Boardman, Onge, Rogers, & Denney, 2005; Gorden-Laren, Adair, Nelson, & Popkin, 2004; Robert & Riether, 2004; Wickramar, Wickrama, & Bryant, 2006). With the growing Hispanic/Latino population, it is essential that early clinical and psychological interventions be in place to prevent weight gain, obesity, and obesity-related chronic illnesses (Goel, McCarthy, Philips, & Wee, 2004). The delivery of culturally competent nursing care requires the process of examining one's own values and beliefs. As with all interventions and education, there is a need for primary prevention efforts that start early in life, and that are linguistically and culturally appropriate to the population being served.

The psychosocial variables of perceived stress, perceived neighborhood disorder, familism, and acculturation are all interconnected and as such, these variables need to be addressed in practice interventions with the fundamental goal of improving health outcomes in the Hispanic adolescent population. The results of this study support linkages between perceived stress and obesity, perceived neighborhood disorder and obesity, acculturation and perceived stress, and perceived neighborhood disorder and perceived stress. It may be possible that interventions aimed at decreasing adolescents' stress level, and improving adolescents' perception of neighborhood safety and acculturation, paired with attempts to foster healthy eating and physical activity, can have a great impact on the overall risks of obesity and related complications.

Another implication for nursing practice is focused on the assessment of group differences on these psychosocial variables in Hispanic adolescents who are obese, or at risk for becoming obese. Knowing the group differences in these psychosocial variables is clinically imperative to help nurses understand how these variables may impact ones perception of obesity. Nurses who care for low-income immigrant populations need to be aware that the populations they serve frequently rate their health, their environment, family, and social connections as poor. Such individuals may be at increased risk for psychosocial issues such as depression, loneliness, isolation, and poor self-esteem and these problems may be linked to poor physical and psychosocial outcomes (Smith et al., 2014). An understanding of the psychosocial variables that relate to adolescent obesity is vital to the development of significant nursing interventions.

Recommendations

Based on the findings and limitations of this study, it would be prudent to replicate this study with a more homogenous sample of Hispanic adolescent females who are obese or at risk of becoming obese. In addition, the theoretical and empirical findings of this study provide the direction for further research. Recommendations for subsequent studies include the following:

1. Future studies should control for dietary intake and physical activity level and incorporate additional measures of AL, such as biomarker data, which are a combination of primary mediators and secondary outcomes of AL.

2. Further studies should focus on how perception of neighborhood disorder might increase the risk of obesity when considering other variables such as social characteristics, socioeconomic status (SES), age, race/ethnicity, and gender.
3. Further studies should replicate this study in Hispanic adolescent females with a large enough sample size to compare group means between the Hispanic sub-groups.
4. The theory of obesity tested in this study needs to be replicated in a sample of Hispanic adolescent males using the same study variables.
5. Mediation models need to be examined using theoretically relevant variables to help explain the relationship between acculturation and obesity.
6. Moderation models need to be examined using theoretically relevant variables to help explain the relationship between perceived neighborhood disorder and obesity.
7. In the present study, participants were excluded from the study if they had chronic illness such as depression, hypertension, and diabetes. Further research with a sample of adolescents with chronic illnesses may provide insight into their perception of their obesity, perceived stress, and family relationships.

References

- Abraido-Lanza, A.F., Chao, M.T., & Florez K.R. (2005). Do healthy behaviors decline with greater acculturation?: Implications for the Latino mortality paradox. *Social Sciences & Medicine*, 61, 1243-1255.
- Acevedo-Garcia, D., & Bates, L.M. (2008). *Latino health paradoxes: Empirical evidence, explanations, future research, and implications*. Latinas/os in the United States: Changing the Face of America, Chapter 7, 101-113.
- Aranda, M.P., & Knight, B.G. (1997). The influences of ethnicity and culture on the caregiver stress and coping process: A sociocultural review and analysis. *The Gerontologist*, 37, 342-357.
- Austin, J.L., Smith, J.E., Gianini, L., & Campos-Melady, M. (2013). Attitudinal familism predicts weight management adherence in Mexican-American women. *Journal of Behavior Medicine*, 36, 259-269.
- Avis, N.E., & Colvin, A. (2007). Disentangling cultural issues in quality of life data. *Menopause*, 14, 708-716.
- Ayon, C., Marsiglia, F.F., Bermudez-Parsai, M. (2010). Latino family mental health: Exploring the role of discrimination and familismo. *Journal of Community Psychology*, 38, 742-756.
- Bahreianian, S., Ball, G.D.C., Vander-Leek, T.K., Colman, I., McNeil, B.J., Becker, A.B., & Kozyrskyj, A.L. (2013). Allostatic load biomarkers and asthma in adolescents. *American Journal Respiratory Critical Care Medicine*, 187(2), 144-152.
- Barkin, S., Rao, Y., Smith, P., & Po'e, E. (2012). A novel approach to the study of pediatric obesity: A biomarker model, *Pediatric Annals*, 41, 250-256.
- Barona, A., & Miller, J.A. (1994). Shoert acculturation scale for Hispanic youth (SASH-Y): A preliminary report. *Hispanic Journal of Behavioral Sciences*, 16(2), 155-162.

- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator distinction in social psychology research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182.
- Bassali, R., Waller, J.L., Gower, B. Allison, J., & Davis, C.L. (2010). Utility of waist circumference percentile for risk evaluation in obese children. *International Journal of Pediatric Obesity*, 5, 97-101.
- Bentler, P.M. (1989). Comparative fit indexes in structural models. *Psychological Bulletin*, 107(2), 238-246
- Berry, J.W. (2003). Acculturation: Living successful in two cultures. *International Journal of Intercultural Relations*, 29, 697-712.
- Berry, J. W., Kim, U., Power, S., Young, M., & Bujaki, M. (1989). Acculturation attitudes in plural societies. *Applied Psychology*, 38, 185-206.
- Berry, J.W., Phinney, J.S., Sam, D.L., & Vedder, P. (2006). Immigrants youth: Acculturation, identity, adaptation. *Applied Psychology*, 55(3), 303-332.
- Berry, J.W., & Sam, D.L. (1997). Acculturation an adaptation. In J.W. Berry, M.H. Segall, & C. Kagitcibasi (Eds.), *Handbook of cross-cultural psychology: Social behavior and application* (2nd ed., 291-326). Needham heightd, MA: Allyn & Bacon.
- Bjorntorp, P. (2001). Do stress reaction cause abdominal obesity and comorbidities? *Obesity Review*, 2, 73-86.
- Boehmer, T.K., Hoehner, C.M, Deshpande, A.D., Brennan-Ramirez, L.K., & Brownson, R.C. (2007). *International Journal of Obesity*, 31, 968-977.
- Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, 32, 515-531.

- Bronfenbrenner, U. (1984). Ecological models of human development. *International Encyclopedia of Education, Vol 3, 2nd Ed.* Oxford: Elsevier.
- Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. *Development Psychology, 22*, 723-742.
- Brown, G.W., & Harris, T. (1989). *Life events and illness*. New York: Guilford Press.
- Bughi, S., Haddad, J., Josef, V., Lee, M., Tran, J., Young, S., Borovay, J., & Miller, J. (2010). Food stress and the health of immigrant populations. *Global Studies Journal, 2* (2), 131-142.
- Burdett, A.M., & Hill, T.D. (2008). An examination of processes linking perceived neighborhood disorder and obesity. *Social Science & Medicine, 67*, 38-46.
- Burdette, A.M., & Needham, B.L. (2012). Neighborhood environment and body mass index trajectories from adolescent to adulthood. *Journal of Adolescent Health, 50*, 30-37.
- Caplan, S. (2007). Latinos, acculturation, and acculturative stress: A dimensional concept analysis. *Policy, Politics, & Nursing Practice, 8*(2), 93-106.
- Caprio, S., Daniels, S.R., Drewnoski, A., Kaufman, F.R., Palinkas, L.A., Rosebloom, A.A., & Schwimmer, J.B. (2008). Influence of race, ethnicity, and culture on childhood obesity: Implications for prevention and treatment. *Diabetes Care, 31*, 2211-2221.
- Carlson, E.D., & Chamberlain, R.W. (2005). Allostatic load and health disparities: A theoretical orientation. *Research in Nursing & Health, 28*, 306-315.
- Cartagena, D. C., Ameringer, S. W., McGrath, J., Jallo, N., Masho, S. W. and Myers, B. J. (2014). Factors Contributing to Infant Overfeeding with Hispanic Mothers. *Journal of Obstetric, Gynecologic, & Neonatal Nursing, 43*, 139-159.

Cartagena, S.W.A., McGrath, J., Jallo, N., Masho, S.W. & Myers, B.J. (2014). Factors contributing to infant overfeeding with Hispanic mothers. *Journal of Obstetric, Gynecologic, & Neonatal Nursing* 43, 2, 139–159.

Center for Disease Control and Prevention. CDC 24/7: Saving Lives and Protecting People (2009). Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of obesity in the United States, 2009–2010. NCHS data brief, no 82. Hyattsville, MD: National Center for Health Statistics. 2012.
<http://www.cdc.gov/nchs/data/databriefs/db82.htm>

Center for Disease Control and Prevention. CDC 24/7: Saving Lives and Protecting People (2012). <http://www.cdc.gov/Features/HispanicHeritageMonth/>

Center for Disease Control and Prevention. CDC 24/7: Saving Lives and Protecting People (2012). Centers for Disease Control and Prevention. Trends in the Prevalence of Extreme Obesity Among US Preschool-Aged Children Living in Low-Income Families, 1998-2010. *JAMA*. 2012; 308 (24): 2563-2565.
<http://www.cdc.gov/obesity/data/childhood.html>

Cervantes, R.C., Padilla, A.M., Napper, L.E., & Goldbach, J.T. (2013). Acculturation-related stress and mental health outcomes among three generations of Hispanic adolescents. *Hispanic Journal of Behavioral Sciences*, 35, 451-468.

Chan, J.M., Rimm, E.B., Colditz, G.A., Stampfer, M.J., & Willett, WC (1994). Obesity, fat distribution, and weight gain as risk factors for clinical diabetes in men. *Diabetes Care*, 17, 961-969.

Chinn, S. A simple method for converting an odds ratio to effect size for use in meta-analysis. *Stat. Med*, 19, 3127-3131.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.

- Cohen, S., & Williamson, G. M. (1988). *Perceived stress in a probability sample in the United States*. In S. Spacapan & S. Okamp (Eds.), *The social psychology of health* (pp. 31-67). Newbury Park, CA: Sage.
- Contreras, J.M. & Steidel, A.G. (2003). A new familism scale for use with Latino populations. *Hispanic Journal of Behavioral Sciences*, 25, 312-319.
- Concha, M., Sanchez, De La Rosa, M., & Villare, M.E. (2013). A longitudinal study of social capital and acculturation-related stress among recent Latino immigrants in South Florida. *Hispanic Journal of Behavioral Sciences*, 35(4), 469-485.
- Creighton, M.J., Goldman, N., Pebley, A.R., & Chung, C.Y. (2012). Durational and generational differences in Mexican immigrant obesity: Is acculturation the explanation? *Social Science & Medicine*, 75, 300-310.
- Crist, J.D., McEwen, M.M., Herrera, A.P., Kim, S.S., Pasvogel, A., & Hepworth, J.T. (2009). Caregiving burden, acculturation, familism, and Mexican American elders' use of home care services. *Research and Theory for Nursing Practice: An International Journal*, 2, 165-180.
- Cuellar, I., Arnold, B., & Gonzalez, G. (1995). Cognitive referents of acculturation: Assessment of cultural constructs in Mexican Americans. *Journal of Community Psychology*, 23, 339-356.
- Cummins, S. & Macintyre, S. (2002) "Food deserts" — evidence and assumption in health policy making. *British Medical Journal*, 325, 436
- D'Alonzo, K.T., Johnson, S., & Fanfan, D. (2012). A biobehavioral approach to understanding obesity and the development of obesogenic illness among Latino immigrants in the United States. *Biological Research for Nursing*, 00 (0), 1-11.

- Das, U.N. (2002). Obesity, metabolic syndrome X, and inflammation. *Nutrition, 18*(5), 430-432.
- Dillon, F.R., De La Rosa, M., & Ibanez, G.E. (2012). Acculturative stress and diminishing family cohesion among recent Latino immigrants. *Journal of Immigrant Minority Health, 2013*, 484-491.
- Desjarlais, R., Eisenberg, L., Good, B., & Kleinman, A. (1995). *World mental health*. Oxford, England: Oxford University Press.
- DeVriendt, T., Clays, E., Maes, L., De Bourdeaudhuij, I., Vicente-Rodriguez, G., Moreno, L.A., Nagy, E., Molnar, Ortega, F.B., Dietrich, S., Manios, Y., & De Henauw, S. (2011). European adolescents' level of perceived stress and its relationship with body adiposity---The HELENA Study. *European Journal of Public Health, 22*, 519-524.
- Epel, E.S., McEwen, B.S., Seeman, T., Matthews, K., Castellazzo, G., Brownell, K.D., Bell, J., & Ickovics, J.R. (2000). Stress and body shape: Stress-induced cortisol secretion is consistently greater among women with central fat. *Psychosomatic Medicine, 62*, 623-632.
- Escobar, J.L. & Vega, W.A. (2000). Mental health and immigrations AAAs: Where are we and where do we go from here? *Journal of Nervous and Mental Disease, 188*(11), 736-740.
- Evenson, K.R., Scott, M.M., Cohen, D.A., & Voorhees, C.C. (2007). Girls' perception of neighborhood factors on physical activity, sedentary behavior, and BMI. *Obesity, 15*, 430-445.
- Evans, G.W., Kim, P., Ting, A.H., Tesher, H.B., & Shannis, D. (2007). Cumulative Risk, maternal responsiveness, and allostatic load among young adolescents. *Developmental Psychology, 43*(2), 341-351.

- Ewart, G.K., Elder, G.J., & Smyth, J.M. (2014). How neighborhood disorder increases blood pressure in youth: agonistics striving and subordination. *Journal of Behavioral Medicine*, 37, 113-126.
- Farag, N.H., Moore, W.E., Lovallo, W.R., Mills, P.J., Kandrika, S., & Elchner, J.E.(2008). Hypothalamic-pituitary-adrenal axis function: Relative contributions of perceived stress and obesity in women. *Journal of Women's Health*, 17, 1647-1655.
- Fanzini, L., Elliott, M.N., Cuccario, P., Schuster, M., Gilliland, J., Grunbaum, J., Franklin, F., & Tortolero, S.R. (2009). Influences of physical and social neighborhood environments on children's physical activity and obesity. *Americian Journal of Public Health*, 99(2), 271-278.
- Finch, B., & Vega, W. (2003). Acculturation stress, social support, and self-rated health among Latinos in California. *Journal of Immigrant Health*, 5, 109-115.
- Flegal, K.M., Carroll, M.D., Ogden, C.L., & Johnson, C.L. (2002). Prevalence and trends in obesity among US adults, 1999-2002. *Journal of American Medical Association (JAMA)*, 288, 1723-1727.
- Gallo, L.C., Penedo, F.J., , De los Monteros, E., & Arguelles, W. (2009). Resiliency in the face of disadvantage: Do Hispanic cultural characteristics protect health outcomes? *Journal of Personality*, 77, 1707-1746.
- Garza, R.T. & Gallegos, P.I. (1985). Environmental influences and personal choice: A humanistic perspective on acculturation. *Hispanic Journal of Behavioral Sciences*, 7, 365-379.
- Geis, K.J., & Ross, C.E. (1998). A new look at urban alienation: The effect of neighborhood disorder on perceived power- lessens. *Social Psychology Quarterly*, 61, 232-246.

- German, M., Gonzalez, N.A., & Dumka, L. (2008). Familism values as a protective factor for Mexican-origin adolescents exposed to deviant peers. *Journal of Early Adolescence*, 29, 16–42.
- Gil, A. G., Wagner, E.F., & Vega, W.A. (2000). Acculturation, familism, and alcohol use Latino adolescent males: Longitudinal relations. *Journal of Community Psychology*, 28, 443-458.
- Goel, M. S., McCarthy, E. P., Phillips, R. S., & Wee, C. C. (2004). Obesity among U.S. immigrants subgroups by duration of residence. *Journal of American Medical Association (JAMA)*, 292(23), 2860-2867.
- Gordon-Larsen, P., Harris, K. M., Ward, D. S., & Popkin, B. M. (2003). Acculturation and overweight-related behaviors among Hispanics immigrants to the US: the national longitudinal study of adolescent health. *Social Science & Medicine*, 57, 2023-2034.
- Goodman, E., McEwen, B.S., Huang, B., Dolan, L.M., & Adler, N.E. (2005). Social inequalities in biomarkers of cardiovascular risk in adolescence. *Psychosomatic Medicine*, 67(1), 9-15.
- Grebler, L., Moore, J.W., & Guzman, R. (1970). *The Mexican-American People*. New York: Free Press.
- Green, R. Santoro, A.P., McGinn, R.P., Wildman, C.A., Derby, A.J., & Weiss, G. (2010). The relationship between psychosocial status, acculturation, and country of origin in mid-life Hispanic women: Data from the study of women's health across the nation (SWAN). *Climacteric*, 13, 534-543.
- Grundy, S.M. (2002). Obesity, metabolic syndrome, and coronary atherosclerosis. *Circulations*, 105, 2696-2698.
- Hancock, P.A. (Ed.). (2005). *The Human Face of Technology: Selected Presidential Addresses of the Human Factors and Ergonomics Society*. Human Factors and Ergonomics Society: Santa Monica, CA.

- Hernandez, D.J. (Ed). (1999). *Children of immigrants: Health, adjustments, and public assistance*. Washington, DC: Institute of Medicine, The National Academy Press.
- Hedley, A.A., Ogden, C.L., Johnson, C.L., Carroll, M.D., Curtin, L.R., & Flegal, K.M. (2004). Prevalence of overweight and obesity among US children, adolescents, and adults, 1999-2002. *Journal of American Medical Association (JAMA)*, 291, 2847-2850.
- Hill, T.D., Burdette, A.M., & Hale, L. (2009). Neighborhood disorder, sleep quality, and psychological distress: testing a model of structural amplification. *Health & Place*, 15, 1006-1013.
- Hill, T.D., Ross, C.E., Angel, R.J. (2005). Neighborhood disorder, psychophysiological distress, and health. *Journal of Health and Social Behavior*, 46, 170-181.
- Hubert, H.B., Snider, J., & Winkleby, M.A. (2005). Health status, health behaviors, and acculturation factors associated with overweight and obesity in Latinos from a community and agricultural labor camp survey. *Preventive Medicine*, 40, 642-651.
- Israel, B. A., & Schurman, S. J. (1990). *Social support, control and the stress process*. In K. Lewis, F. Marcus & B. K. Rimer (Eds.), *Health behavior and health education: Theory, research and practice* (pp. 187-215). San Francisco, CA: Jossey-Bass.
- Juster, R. P., McEwen, B. S., & Lupien, S. J. (2010). Allostatic load biomarkers of chronic stress and impact on health and cognition. *Neuroscience and Biobehavioral Reviews*, 35(1), 2-16.
- Kaestner, R., Pearson, J.A., Keene, D., & Geronimus. (2010). Stress, allostatic load and health of Mexican Immigrants. *Social Science Quarterly*, 90, 1089-1111.
- Katragadda, C.P. & Tidwell, R. (2006). Rural Hispanic adolescents at risk for depressive symptoms. *Journal of Applied Social Psychology*, 28, 1916-1930.

- Kaplan, M.S., Huguert, N., & McFarland B.H. (2004). The association between length of residence and obesity among Hispanic immigrants. *American Journal Preventive Medicine*, 27 (4), 323-326.
- Keefe, S. E. (1979). Urbinization, acculturation, and extended family ties: Mexican Americans in cities. *American Ethnologist*, 6, 349-365.
- Keefe, S.E. (1984). Real and ideal extended familism among Mexican Americans and Anglo Americans: On the meaning of "close" family ties. *Human Organization*, 43, 65-70.
- Keefe, S. E., Padilla, A.M., & Carlos, M.L. (1979). The Mexican-American extended family as an emotional support system. *Human Organization*, 38, 144-152.
- Keys, A., Fidanza, F., Karvonen, M.J., Kimura, N., & Taylor, H.L. (1972). Indices of relative weight and obesity. *Journal of Chronic Disease*, 25:329-343.
- Khan, L.K., Sobal, J., & Martorell, R. (1997). Acculturation, socioeconomic status, and obesity in Mexican Americans, Cuban Americans, and Puerto Ricans. *International Journal of Obesity*, 21, 91-96.
- Kline, R. B. (2005). *Principles and practice of Structural Equation Modeling*. New York: The Guilford Press.
- Klein, S., Allison, D.B., Heymsfield, S.B., Kelley, D.E., Leibel, R.L., Nonas, C., & Kahn, R. (2007). Waist circumference and cardiometabolic risk: a consensus statement from Shaping America's Health: Association for Weight Management and Obesity Prevention; NAASO, The Obesity Society; the American Society for Nutrition; and the American Diabetes Association. *American Journal of Clinical Nutrition*, 85, 1197-1202.
- Krebs, N.F., Himes, J.H., Jacobson, D., Nicklas, T.A., Guilday, P., & Styne, D. (2007). Assessment of Child and Adolescent Overweight and Obesity. *Pediatrics*, 120(4), S193-S228.

Kruger, J., & Higgins, D.L. (2002). Housing and health: Time again for public health action. *American Journal of Public Health*, 92, 758-768.

Kutchman, E., Lawhun, S., Iaheta, J., & Heniberg, L.J. (2009). Smolak, Linda (Ed); Thompson, J. Kevin (Ed), (2009). *Body image, eating disorders, and obesity in youth: Assessment, prevention, and treatment. (2nd ed).* , (pp.157-173). Washington, DC, US: American Psychological Association.

Lara, M., Gamboa, C., Kahramanian, M.I., Morales, L.S., & Bautista, D.E. (2005). Acculturation and Latino health in the United States: A review of the literature and its sociopolitical context. *Annual Review of Public Health*, 26, 367-397.

Latkin, C.A., & Curry, A.D. (2003). Stressful neighborhoods and depression: A prospective study of the impact of neighborhood disorder. *Journal of Health and Social Behavior*, 44, 34-44.

Lazarus, R. S. (1966). *Psychological stress and the coping process*. New York: McGraw-Hill.

Lazarus, R. S. (1977). *Psychological stress and coping in adaptation and illness*. In Z. J. Lipowski, D. R. Lipsitt, & P.C. Whybrow (Eds.), *Psychosomatic medicine: Current trends* (pp. 14-26). New York: Oxford University Press.

Lazarus, R.S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.

Leventhal, T., & Brooks-Gunn, J. (2000). The neighborhoods they live in: The effects of neighborhood residence on child and adolescent outcomes. *Psychological Bulletin*, 126, 309-337.

Lind, C., Mirchandani, G.C., Castrucci, B.C., Chavez, N., Handler, A., & Hoelscher, D.M. (2012). The effects of acculturation on healthy lifestyle characteristics among Hispanic fourth-grade children in Texas public schools, 2004-2005. *Journal of School Health*, 82, 166-174.

- Liu, J., Probst, J.C., Harun, N., Bennett, K.J., & Torres, M.E. Acculturation, physical activity, and obesity among Hispanic adolescents. *Ethnicity & Health*, 14, 509-525.
- Lubans, D.R., Morgan, P.J., Aguiar, E.J., & Callister, R. (2011). Randomized controlled trial of physical activity leaders (PALs). *Preventive Medicine*, 52, 239-246.
- Luna, I., De Ardon, E.T., Lim, Y.M., Cromwell, S.L., Phillips, L.R., & Russell, C.K. (1996). The relevance of familism in cross-cultural studies of family caregiving. *Western Journal of Nursing Research*, 18, 267-283.
- Mangold, D., Wand, G., Javors, M., & Mintz, J. (2010). Acculturation childhood trauma and the cortisol awakening response in Mexican-American adults. *Hormones and Behavior*, 58, 637-646.
- Marin, G. (1993). Issues in the measurement of acculturation among Hispanics. In K. Geisinger (ed.), *Psychological testing of Hispanics*, (pp. 235-252). Washington, DC: American Psychological Association.
- Markides, K. S., & Coreil, J. (1986). The health of Hispanics in the Southwestern United States: An epidemiological paradox. *Public Health Reports*, 101, 253-265.
- Martin, R.A., Kazarian, S.S., Breiter, H.J. (1995). Perceived stress, life events, dysfunctional attitudes, and depression in adolescent psychiatric patients. *Journal of Psychopathology and Behavioral Assessment*, 17, 81-95.
- Marsiglia, F. F., Parsai, M., & Kulis, S. (2009). Effects of familism, family cohesion and family adaptability on problem behaviors among adolescents in Mexican immigrant families. *Journal of Ethnic & Cultural Diversity in Social Work*, 18 (3), 203-220.
- Mathews, K. A., Owens, J. F., Edmundowicz, D., Lee, L., & Kuller, L. H. (2006). Positive and negative attributes and risk for coronary and aortic calcification in healthy women. *Psychosomatic Medicine*, 68, 355-361.

- Mattei, J., Demissie, S., Falcon, L.M., Ordovas, J.M., & Tucker, K. (2010). Allostatic load is associated with chronic conditions in the Boston Puerto Rican health study. *Social Science Medicine*, 70(12), 1988-1996.
- McEwen, B.S. (1998). Protective and damaging effects of stress mediators. *The New England Journal of Medicine*, 338(3), 171-179.
- McEwen, B.S. (1998). Stress, adaptation, and disease allostasis and allostatic load. *Annals of the New York Academy of Sciences*, 840, 33-44.
- McEwen, B.S. (1999). Stress and hippocampal plasticity. *Annals Review Neuroscience*, 22, 105-122.
- McEwen, B.S. (2000). Allostasis and allostatic load: Implications for neuropsychopharmacology. *Neuropsychopharmacology*, 22(2), 108-124.
- McEwen, B.S. (2001). Plasticity of the hippocampus: Adaptation to chronic stress and allostatic load. *Annual New York Academy Science*, 933, 265-277.
- McEwen, B. S. (2006). Protective and damaging effects of stress mediators: Central role of the brain. *Dialogue in Clinical Neuroscience*, 8, 367-381.
- McEwen, B.S. & Lasley, E.N. (2002). *The end of stress as we know it*. Washington, DC: Joseph Henry Press.
- McEwen, B.S. & Seeman, T. (1999). Protective and damaging effects of mediators of stress. Elaborating and testing the concepts of allostasis and allostatic load. *Annals New York Academy of Sciences*, 30-47.
- McEwen, B.S. & Wingfield, J.C. (2002). The concept of allostasis in biology and biomedicine. *Hormones and Behavior*, 43, 2-15.

- McLoyd, V.C. (1998). Socioeconomic disadvantage and child development. *American Psychology*, 53, 185-204.
- Merten, M.J. (2010). Parental health and adolescent obesity in the context of community disadvantage. *Health Place*, 16, 1053- 1057.
- Mirkopoulou, D. Grammatikopoulou, M.G., Gerothanasi, K., Tagka A., Stylianou, C., & Hassapidou M. (2010). Metabolic indices, energy and macronutrient intake according to weight status in a rural sample of 17-year-old adolescents. *Rural & Remote Health*, 10, 1-11.
- Musgrave-Kelly, J.L. (2008). Comparison of perceived stress, allostatic load and racial discrimination in different cultural groups of pregnant black women. Thesis dissertation.
- Negy, C., & Woods, D.J. (1992). The importance of acculturation in understanding research with Hispanic-Americans. *Hispanic Journal Behavioral Science*, 13, 224-247.
- Neuhouser, M.L., Thompson, B., Coronado, G.D., & , Solomon, C.C. (2004). Higher fat intake and lower fruit and vegetables intakes are associated with greater acculturation among Mexicans living in Washington State. *Journal of American Diet Association*, 104, 51-57.
- Neumark-Sztainer , D., Story, M., Hannan, P.J., Tharp, T., & Rex, J. (2003). Factors associated with changes in physical activity: a cohort study of inactive adolescent girls. *Archives of Pediatric Adolescent Medicine*, 157, 803-810.
- Nguyen-Rodriguez, S.T., Chou, C.P., Unger, J.B. & Spruijt-Metz, D. (2008). BMI as a moderator of perceived stress and emotional eating in adolescents. *Eating Behavior*, 9, 238-246.

- Nihiser, A.J., Lee, S.M., Wechsler, H., McKenna, M., Odom, E., Reinold, C., Thompson, D., & Grummer-Strawn, L. (2009). BMI Measurement in Schools. *Pediatrics*, 124, S89-S97.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. New York: McGraw-Hill.
- Office of Management and Budget. Directive No. 15; race and ethnic standards for federal statistics and administrative reporting. In: *Statistical Policy Handbook*. Washington, DC: Office of Federal Statistical Policy and Standards, US Department of Commerce, 37-38.
- Ogden, C.L., Carroll, M.D., Kit, B.K., & Flegal, K.M. (2012). Prevalence of obesity and trends in body mass index among US children and adolescents, 1999-2010. *Journal of American Medical Association, (JAMA)*, 307, 483-490.
- Ogden, C.L., Carroll, M.D., Kit, B.K., & Flegal, K.M. (2014). Prevalence of childhood and adult obesity in the United States, 2011-2012. *Journal of the American Medical Association, (JAMA)*, 311, 806-814.
- Ogden, C.L., Carroll, M.D., Curtin, L.R., McDowell, M.A., Tabak, C.J., & Flegal, K.M. (2006). Prevalence of overweight and obesity in the United States, 1999-2004. *Journal of American Medical Association, (JAMA)*, 295(13), 1549-1555.
- Ogden, C.L., Flegal, K.M., Carroll, M.D., & Johnson, C.L. (2002). Prevalence and trends in overweight among US children and adolescents, 1999-2000. *Journal of American Medical Association (JAMA)*, 288(14), 1728-1732.
- Passel, J., & Taylor, P. (2010). *Unauthorized Immigrants and Their U.S.-Born Children*. Pew Hispanic Center. 1615 L Street, NW, Suite 700, Washington, DC 20036-5610; www.pewhispanic.org
- Peralta, L. R., Jones, R. A. & Okely, A. D. (2009). Promoting healthy lifestyles among adolescent boys: The Fitness Improvement and Lifestyle Awareness Program RCT. *Preventive Medicine*, 48 (6), 537-542.

- Peek, M.K., Cutchin, M.P., Salinas, J.J., Sheffield, K.M., Eschbach, K., Stowe, R.P., & Goodwin, J.S. (2010). Allostatic load among Non-Hispanic Whites, Non-Hispanic Blacks, and people of Mexican Origin: Effects of ethnicity, nativity, and acculturation. *American Journal of public Health, 100*(5), 940-946.
- Peralta, L.R., Jones, R.A., & Oakley, AD. (2009). Promoting healthy lifestyles among adolescent boys: The fitness improvement and lifestyle awareness program RCT. *Preventive Medicine, 48*, 537-542.
- Perez-Escamilla, R. & Putnik, P. (2007) The role of acculturation in nutrition, lifestyle, and incidence of type 2 diabetes among Latinos. *The Journal of Nutrition, 137*, 860-870.
- Phinney, J. S. (2003). *Ethnic Identity and Acculturation*. In K. M. Chun, P. Balls Organista, & G. Marin (Eds.), *Acculturation: Advances in Theory, Measurement, and Applied Research* (pp. 63-81). Washington DC: American Psychological Association.
- Popkin, B. M. (2001). The nutrition transition and obesity in the developing world.. *Journal of Nutrition, 131*, 871S–873S.
- Popkin, B.M. (2010). Recent dynamics suggest selected countries catching up to US obesity. *American Journal of Clinical Nutrition, 9*(1), 284-288.
- Popkin, B. M., & Drenowski, A. (1997). Dietary fats and the nutrition transition: New trends in the global diet. *Nutrition Reviews, 55*, 31–43.
- Popkin, B.M., & Udry, R. (1998). Adolescent obesity increases significantly in second and third generation U.S. immigrants: The national longitudinal study of adolescent health. *American Society for Nutritional Sciences, 1998*, 701-706.
- Ramos B, Jaccard J, Guilamo-Ramos V. (2003). Dual ethnicity and depressive symptoms: Implications of being Black and Latino in the United States. *Hispanic Journal of Behavioral Sciences, 25*, 147–173.

- Rodriguez, J.M. & Kosloski, K. (1998). The impact of acculturation on attitudinal familism in a community of Puerto Rican Americans. *Hispanic Journal of Behavioral Sciences*, 20, 375-390.
- Rodriguez, N., Mira, C.B., Paez, N., & Myes, H.F. (2007). Exploring the complexities of familism and acculturation central constructs for people of Mexican origin. *American Journal of Community Psychology*, 39, 61-77.
- Rodriguez, N., Myers, H.F., Mira, C.B., Flores, T, & Garcia-Hernandez, L. (2002). Development of the multidimensional acculturative stress inventory for adults of Mexican origin. *Psychological Assessment*, 14, 451-461.
- Romero, A.J., Robinson, T.N., Haydel, K.F., Mendoza, F., & Killen, J.J. (2004). Association among familism, language preference, and education in Mexican-American mothers and their children. *Developmental and Behavioral Pediatrics*, 25, 34-40.
- Roosa, M., Deng, S., Ryu, E., Burrell, B., Tein, J., Lopez, V., & Crowder, S. (2005). Family and child linking neighborhood context and child externalizing behavior. *Journal of Marriage and Family*, 67, 515-529.
- Roosa, M.W., Jones, S., Tein, J.Y., & Cree, W. (2003). Prevention science and neighborhood influences on low-income children's development: theoretical and methodological issues. *American Journal of Community Psychology*, 31(1-2), 55-72.
- Ross, C.E. & Jang, S.J. (2000). Neighborhood Disorder, Fear, and Mistrust: The Role of Social Ties with Neighbors. *American Journal of Community Psychology*, 28(4), 401-420
- Ross, C.E., & Mirowsky, J. (1999). Disorder and decay: The concept and measurement of perceived neighborhood disorder. *Urban Affairs Review*, 34, 412-431.
- Ross, C.E., & Mirowsky, J. (2001). Neighborhood Disadvantage, Disorder, and Health. *Journal of Health and Social Behavior*, 42, 258-276.

- Ross, C.E., & Mirowsky, J. (2009). Neighborhood disorder, subjective alienation, and distress. *Journal of Health and Social Behavior*, 50, 49-64.
- Ross, C.E., Mirowsky, J., & Pribesh, S. (2001). Powerless and the amplification of threat: neighborhood disadvantage, disorder, and mistrust. *American Sociological Review*, 66, 568-591.
- Sabogal, F., Marin, G., Otero-Sabogal, R., Marin, B., & Perez-Stable, E. (1987). Hispanic familism and acculturation: What changes and what doesn't. *Hispanic Journal of Behavioral Health*, 9, 397-412.
- Sanjur, D., Immink, M.D., Colon, M., Bentz, L., Burgos, M., & Alicea-Santana, S. (1986). Trends and differentials in dietary patterns and nutrient intake among migrant Puerto Rican families. *Archives Latinoamerican Nutrition*, 36, 525-641.
- Sarkar, S & Mukhopadhyay, B. (2007). Perceived psychosocial stress and cardiovascular risk: Observation among the Bhutias of Sikkim, India. *Stress and Health*, 24, 23-24.
- Sampson, R.J., Raudenbush, S.W., & Earls, F. (1997). Neighborhood and violent crime: A multilevel study of collective efficacy. *Science*, 277, 918-924.
- Schofield, T.J., Conger, R.D., Conger, K.J., Martin, M.J., Brody, B., Simons, R., & Cutrona, C. (2012). Neighborhood disorder and children's antisocial behavior: The protective effect of family support among Mexican American and African American families. *American Journal of Community Psychology*, 50(1-2), 101-113.
- Schulz, A.M., Mentz, G., Lachance, L., Johnson, J., Gaines, C., & Israel, B.A. (2012). Associations between socioeconomic status and allostatic load: Effects of neighborhood poverty and tests of mediating pathways. *American Journal of Public Health*, 102(9), 1706-1714.
- Schwartz, S.J. (2007). The applicability of familism to diverse ethnic groups: A preliminary. *The Journal of Social Psychology*, 147(2), 2007

- Singh, G.K., Kogan, M.D. & Dee, D.L. (2007). Nativity/immigrant status, race/ethnicity, and socioeconomic determinants of breastfeeding initiation and duration in the United States. *Pediatrics*, 119, S38-S46.
- Singh, G.K., Kogan, M.D., & Yu, S.M. (2009). Disparities in obesity and overweight prevalence among US immigrant children and adolescents by generational status. *Journal of Community Health*, 34, 271-281.
- Singh, G.K., & Siahpush, M. (2002). Ethnic-immigrants differentials in health behaviors, morbidity, and cause-specific mortality in the United States: An analysis of two national databases. *Human Biology*, 74(1), 83-109.
- Singh, G.H., Yu, S.M., Siahpush, M. & Kogan, M.D. (2008). High levels of physical inactivity and sedentary behaviors among US immigrants children and adolescents. *Archives of Pediatrics and Adolescent Medicine*, 162, 756-763.
- Singhal, V., Schwenk, W.T., & Kumar, S. (2007). Evaluation and management of childhood and adolescent obesity. *Mayo Clinic Proceedings*, 82, 1258-1264.
- Skogan, W.G. (1986). Fear of crime and neighborhood change in a communities and crime. *Crime and Justice: A Review of Research*, 8, 203-229.
- Skogan, W.G. (1990). *Disorder and Decline: Crime and The Spiral Decay in American Neighborhoods*. New York: Free Press
- Skogan W.G., & Maxfield, M.G. (1981). *Coping with Crime: Individual and neighborhood reactions*. Sage Publication: Social Science.
- Smokowski, P.R., & Bacallao, M. L. (2007). Acculturation, internalizing mental health symptoms, and self-esteem: Cultural experiences of Latino adolescents in North Carolina. *Child Psychiatry and Human Development*, 37, 273-292.
- Smokowski, P.R., Chapman, M.V., & Bacallao, M.L. (2007). Acculturation risk and protective factors and mental health symptoms in immigrant Latino adolescents. *Journal of Human Behavior in the Social Environment*, 16, 33-55.

- Smokowski, P.R., Rose, R., & Bacallao, M.L. (2008). Acculturation and Latino family process: How cultural involvement, biculturalism, and acculturation gaps influences family dynamics. *Familt Relations*, 57, 295-308.
- Spolidoro, J.V., Pitrez, M.L., Vargas, L.T., Santana, J.C., Pitrez, E., Hauschild, J.A., Bruscato, N.M., Moriguchi, E.H., Medeiros, A.K., & Piva, J.P. (2013). Waist circumference in children and adolescents correlate with metabolic syndrome and fat deposits in young adults. *Clinical Nutrition*, 32, 93-97.
- Steffen, P.R., Smith, T.B., Larson, M., & Butler, L. (2006). Acculturation to western society as a risk for high blood pressure: A meta-analytic review. *Psychosomatic Medicine*, 68, 386-397.
- Steidel A.G.L., & Contreras, J.M. (2003). A new familism scale for use with Latino populations. *Hispanic Journal of Behavioral Sciences*, 25, 312-330.
- Stephoe, A. & Feldman, P. (2001). Neighborhood problems as sources of chronic stress: Development of a measure of neighborhood problems, and association with socioeconomic status and health. *Annals of Behavioral Medicine*, 23, 177-185.
- Sussner, K.M., Lindsay, A.C., Greaney, M.L. & Peterson, K.E. (2008). The influence of immigrant status and acculturation on the development of overweight in Latino families: A qualitative study. *Journal of Immigrant Minority Health*, 10, 497-505.
- Swallen, K.C., Reither, E.N., Haas, S.A., & Meier, A.N. (2005). Overweight, obesity, and health-related quality of life among adolescents: The national longitudinal study of adolescent health. *Pediatrics*, 115, 340-347.
- Tabachnick, B. G., & Fidell, L. S. (2001). Using multivariate analysis. Boston: Allyn & Bacon.
- Taylor, R.W., Jones, I.E., Williams, S.M., & Goulding, A. (2000). Evaluation of waist circumference, -to-hip, and the conicity index as screening tools for high trunk fat mass, as measured by dual-energy X-ray absorptiometry, in children aged 3-19 y. *Americian Journal of Clinical Nutrition*, 72, 490-495.

- Tirodkar, M.A., Song, J., Chang, R.W., Dunlop, D.D., & Chang, H.J. (2008). Racial and ethnic differences in activities of daily living disability among the elderly: The case of Spanish speakers. *Archives Physical Medicine Rehabilitation*, 89, 1262-1266.
- Troiano, R.P. & Flegal, K.M. (1998). Overweight children and adolescents: Epidemiology and demographics. *Pediatrics*, 101, 497-504.
- U.S. Department of Health and Human Services Office of Minority Health. (USSDHOMH, 2009). Working Group Report on Future Research Directions in Childhood Obesity Prevention and Treatment.
<http://www.minorityhealth.hhs.gov/>
- U.S. Department of Health & Human Services, (USSHHS, 2011). National Prevention Council, *National Prevention Strategy*, Washington, DC: U.S. Department of Health and Human Services, Office of the Surgeon General, 2011.
<http://www.hhs.gov/>
- Unger, J.B., Reyonalds, K., Shakib, S., Spruijt_Metz, D., Sun, P., & Anderson-Johnson, C. (2004). Acculturation, physical activity, fast food consumption among Asian Americans and Hispanic adolescents. *Journal of Community Health*, 29, 467-481.
- Valenzuela, A. & Dornbusch, S. (1994). Familism and social capital in the ccademic achievement of Mexican origin and Anglo adolescents. *Social Science Quarterly* 75, 18-36.
- Van Den Berg, G., Van Eijdsden, M., Galindo-Garre, F., Vrijkotte, T.G., & Gemke, R.J. (2012). Explaining socioeconomic inequalities in childhood blood pressure and prehypertension: the ABCD study. *Hypertension*, 61, 35-41
- Van Jaarsveld, C.H.M., Fidler, J.A., Steptoe, A., Boniface, D., & Wardle, J. (2009). Perceived stress and weight gain in adolescence: A longitudinal analysis. *Obesity*, 17, 2155-2161.

- Villarreal, R., Blozis, S.A., & Widaman, K.F. (2005). Factorial invariance of a Pan-Hispanic familism scale. *Hispanic Journal of Behavioral Sciences*, 27, 409-425.
- Wang, Y., & Beydoun, M.A. (2007). The obesity epidemic in the United States gender, age, socioeconomic, racial/ethnic, and geographic characteristics: A systematic review and meta-regression analysis. *Epidemiologic Reviews* 29(1): 6-28.
- Wallen, G.R., Feldman, R.H., & Anliker, J. (2002). Measuring acculturation among Central American women with the use of a brief language scale. *Journal Immigrant Health*, 4, 95-102.
- Warner, L.A., Valdez, A., Vega, W.A., De La Rosa, M., Turner, R.J., & Canino, G. Hispanic drug abuse in an evolving cultural context: An agenda for research. *Drug Alcohol Dependence*, 84, S8-S16.
- Wichianson, J.R., Bughi, S.A., Unger, J., Spruijt-Metz, D., & Nguyen-Rodriguez, S. (2009). Perceived stress, coping and night-eating in college students. *Stress Health*, 25, 235-240.
- World Health Organization (WHO), (2013). Obesity and overweight Fact sheet N°311 Updated March 2013.
<http://www.who.int/mediacentre/factsheets/fs311/en/>
- Yeh, M.C., Viladrich, A., Bruning, N., & Roye, C. (2009). Determinants of Latina obesity in the United States: The role of selective acculturation. *Journal of Transcultural Nursing*, 20, 105-115.
- Yu, S.M., Huang, Z.J., Schwalberg, R.H., Overpack, M., & Kogan, M.D. (2003). Acculturation and the health and wellbeing of US immigrants adolescents. *Journal of Adolescent Health*, 33, 479-488.
- Zea, M.C., Asner-Self, K.K., Birman, D., & Buki, L.P. (2003). The abbreviated multidimensional acculturation scale: empirical validation with two Latino/Latina samples. *Cultural Diversity Ethnic Minority Psychology*, 9, 107-126.

Zinn, M.B., (1982). Familism among Chicanos: A theoretical review. *Humboldt Journal of Social Relations*, 10, 224-238

Appendix B

Student ID: _____

Date: _____

Family Values Questionnaire*

Here are some questions that I would like you to decide if you **Strongly Disagree, Disagree, Neutral, Agree or Strongly Agree**. Please **Circle** the number across from the question that you agree or disagree with.

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Children should always help their parents with the support of younger brothers and sisters, for example, help them with homework, help parents take care of children, and so forth.	1	2	3	4	5
2. The family should control the behavior of children younger than 18.	1	2	3	4	5
3. A person should cherish the time spent with her relatives.	1	2	3	4	5
4. A person should live near her parents and spend time with them on a regular basis.	1	2	3	4	5
5. A person should always support members of the extended family, for example, aunts, uncles, and in-laws, if they are in need even if it is a big sacrifice.	1	2	3	4	5
6. A person should rely on her family if the need arises.	1	2	3	4	5
7. A person should feel ashamed if something she does dishonors the family name.	1	2	3	4	5
8. Children should help out around the house without expecting allowance.	1	2	3	4	5

9. Parents and grandparents should be treated with great respect regardless of their differences in views.	1	2	3	4	5
10. A person should often do activities with her immediate and extended families, for example, eat meals, play games, or go somewhere together.	1	2	3	4	5
11. Aging parents should live with their relatives.	1	2	3	4	5
12. A person should always be expected to defend her family's honor no matter what the cost.	1	2	3	4	5
13. Children younger than 18 should give almost all their earnings to their parents.	1	2	3	4	5
14. Children should live with their parents until they get married.	1	2	3	4	5
15. Children should obey their parents without question even if they believe they are wrong.	1	2	3	4	5
16. A person should help her elderly parents in time of need, for example, helping financially or sharing a house.	1	2	3	4	5
17. A person should be a good person for the sake of her family.	1	2	3	4	5
18. A person should respect her older brothers and sisters regardless of their differences in views.	1	2	3	4	5

***Adapted from Steidel & Contreras (2003). A New Familism Scale for use with the Latino population.**

Appendix C

Student ID: _____

Date: _____

Culture Questionnaire*

Here are some questions that I need you to answer about your cultural background. Circle the number across from the question that answers the question. Please note that some column response headings change for the items.

Questions	Only Spanish	More Spanish than English	Both Equally	English better than Spanish	Only English
1. What language do you read and speak?	1	2	3	4	5
2. What language do your parents speak to you in?	1	2	3	4	5
3. What language do you usually speak at home?	1	2	3	4	5
4. In what language to you usually think?	1	2	3	4	5
5. What language do you speak with your friends?	1	2	3	4	5
6. In what language are the T.V. programs you usually watch?	1	2	3	4	5
7. In what language are the radio programs you usually listen to?	1	2	3	4	5
8. In what language are the movies, T.V. and radio programs you prefer to watch?	1	2	3	4	5
9. In What language do your parents speak with their parents?	1	2	3	4	5

Questions continued on the next page

Culture Questionnaire (continued)

Please note that the response headings for the next questions directly above the numbered columns have changed from the previous questions.

Questions	All Latinos/ Hispanics	More Latinos/ Hispanics than Whites	About half and half	More Whites than Latinos or Hispanics	All White
10. Your close friends are:	1	2	3	4	5
11. You prefer going to parties at which the people are:	1	2	3	4	5
12. The persons you visit or who visit you are:	1	2	3	4	5

***Adapted from Barona & Miller (1994) Short Acculturation Scale for Hispanic Youth (SASH-Y)**

Appendix D

Student ID: _____

Date: _____

Neighborhood Questionnaire*

Here are some questions for you to decide if you **Strongly Disagree, Disagree, Agree, or Strongly Agree** with the question. Please **circle** the number across from each question in terms of how much you agree or disagree with it.

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree
------------------	------------------------------	-----------------	--------------	---------------------------

Physical Disorder

1. There is a lot of graffiti in my neighborhood.	1	2	3	4
2. My neighborhood is noisy.	1	2	3	4
3. Vandalism is common in my neighborhood.	1	2	3	4
4. There are a lot of abandoned buildings in my neighborhood.	1	2	3	4

Physical Order

5. My neighborhood is clean.	1	2	3	4
6. People in my neighborhood take good care of their houses and apartments.	1	2	3	4

Social Disorder

7. There are too many people hanging around on the streets near my home.	1	2	3	4
8. There is too much drug use in my neighborhood.	1	2	3	4
9. There is too much alcohol use in my neighborhood.	1	2	3	4
10. I'm always having trouble with my neighbors.	1	2	3	4
11. There is a lot of crime in my neighborhood.	1	2	3	4

Neighborhood Questionnaire (continued)

Questions	Strongly Disagree	Disagree	Agree	Strongly Agree
Social Order				
12. In my neighborhood, people watch out for each other.	1	2	3	4
13. The police protection in my neighborhood is adequate.	1	2	3	4
14. My neighborhood is safe.	1	2	3	4
15. I can trust people in my neighborhood.	1	2	3	4

***Adapted from Ross & Mirowsky (1999). Perceived Neighborhood Disorder Scale.**

Appendix E

Student ID: _____

Date: _____

Stress Questionnaire*

Here are some questions that I would like you to decide if you felt or thought a certain way during the last month. These questions in this questionnaire are asking you about your feeling and thought **during the last month**. Please **Circle** the number across from the question that you agree or disagree with. **0=Never, 1=Almost Never, 2=Sometimes, 3= Fairly Often, and 4=Very Often**

Questions	Never	Almost Never	Sometimes	Fairly Often	Very Often
1. In the last month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
2. In the last month, how often have you felt that you were unable to control the important things in your life?	0	1	2	3	4
3. In the last month, how often have you felt nervous and “stressed”?	0	1	2	3	4
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
5. In the last month, how often have you felt that things were going your way?	0	1	2	3	4
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
7. In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4

Questions continues on the next page

Stress Questionnaire

Questions	Never	Almost Never	Sometimes	Fairly Often	Very Often
8. In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
9. In the last month, how often have you been angered because of things that were outside of your control?	0	1	2	3	4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

***Adapted from Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of Perceived Stress.**

Appendix F

Student ID _____

Demographic Questionnaire

DIRECTIONS: Please check one response to each question and/or fill in the missing blanks.

1. How old are you? _____

2. What grade are you in (check one)?

_____ Freshman

_____ Sophomore

_____ Junior

_____ Senior

3. What race do you consider yourself (check one)?

_____ White

_____ Black or African American

_____ Other (please specify): _____

4. Where you born in the United States?

_____ Yes

_____ No

If No, then in what country were you born? _____

5. Where were your parents born (countries)?

_____ Mother

_____ Father

6. Where were your grandparents born (countries)?

Mother's Side

Grandmother _____

Grandfather _____

Father's Side

Grandmother _____

Grandfather _____

7. What language do you speak at home?

_____ Spanish Only

_____ English Only

_____ Both Spanish and English

8. How many times of week do you eat out at a fast food restaurant (McDonalds, Chinese food, Pizza, etc.)?

_____ per week

9. How often do you exercise (for at least 30 minutes, example running, biking, swimming, vagarious walking) during the week?

_____ Days of the week

10. Have you been diagnosed or told by your primary care provider you have one or more of the following chronic or mental illnesses?

_____ Diabetes

_____ High Cholesterol

_____ Depression

_____ Sickle Cell Anemia

_____ High Blood Pressure

_____ Cerebral Palsy

11. How much time (hours or minutes) do you watch TV per day?

_____ hours

_____ minutes

12. How much time (hours or minutes) do you spend on the Internet/cell phone (Facebook, twitter, tumblr, instagram, etc.) per day?

_____ hours

_____ minutes

13. Do you participate in School/Organized Sports?

_____ No
_____ Yes

If Yes, Please list _____

14. Do you consider yourself:

_____ Under weight
_____ Normal weight
_____ Over weight
_____ Obese

Appendix G

Letters from Participating School Officials



Public Schools of Plainfield New Jersey

Office of the Superintendent of Schools

Anna Belin-Pyles
1200 Myrtle Avenue
Plainfield, NJ 07063
(908) 731-4335 Fax: (908) 731-4336

May 9, 2013

Dear Ms. Shanda Johnson:

This letter is pursuant to your request to conduct your doctoral dissertation research within the Plainfield Public Schools District. I understand that your research focuses on "The relationship between neighborhood safety, acculturation, and familism on obesity in female Hispanic adolescent". As the Superintendent of the Plainfield Public Schools, I am in full support of your using our high school and students to conduct your research. You have my permission to conduct your research in the Plainfield Public School in later spring 2013, and fall 2013 if needed.

As we discussed, the sample for your research will be obtained from freshman, sophomore, junior, and senior level students in the classroom setting and nurses office. Ms. Antoinette Adams, Vice Principal of Special Services, will help you facilitate the process.

Sincerely,

A handwritten signature in black ink that reads "Anna Belin-Pyles".

Anna Belin-Pyles
Superintendent of Schools

ABP/drs

Appendix H

Student Assent, and Parental/Guardian Permission and Consent Forms

Student Assent for Study Participation

You are invited to participate in a research study that is being conducted by Ms. Shanda Johnson who is a doctoral candidate, and a part-time faculty member in College of Nursing at Rutgers University. The purpose of this research is to examine the relationship of neighborhood safety, cultural beliefs, and family values on weight, and waist circumference measurements among Hispanic adolescent females. Dr. Karen T. D'Alonzo, faculty advisor from Rutgers the State University, College of Nursing, will supervise the study.

Your participation in this study will include responding to questions about safety in the neighborhood where you live, beliefs related to your ethnic culture, values that your family feel are important, and demographic questions regarding your age, ethnic culture, and leisure time activities. Your response to the questionnaires will occur in the health class setting and take approximately 40 minutes to complete. You will then be asked to have your height, weight, and waist circumference taken privately in the nurse's office by me or by my research assistant and recorded on a form with your ID code.

Information that you put on the questionnaires will be held in strict confidence. You will not put your name on any of the questionnaires. Instead of using your name, you will be assigned an identity code that is to be written on each questionnaire. You will be asked to sign an assent, and obtain your parental consent to participate in the study. The student assent and parental consent will be separated from your questionnaires and be placed in a locked file in my office.

The research team and the Institutional Review Board (a committee that review research studies in order to protect research participants) at Rutgers University are the only parties that will be allowed to see the information you give, except as may be required by law. If a report of this study is published, or the results are presented at a professional conference, only group results will be stated. All study information from the questionnaires and height, weight, and waist circumference information will be kept for five years in a locked file in my office.

There are no foreseeable risks to participation in this study. In the outside chance that you become upset answering any of the questions, you will have the opportunity to speak with the school nurse or one of the counselors in your school. In addition, you may receive no direct benefit from taking part in this study. Except, if you are the recipient of a winning raffle ticket, and prize. Then you will receive a gift for your participation in the study.

Participation in this study is voluntary. You may choose not to participate, and you may withdraw at any time during the study procedures without any penalty to you. In addition, you may choose not to answer any questions with which you are not comfortable.

If you have any questions about the research, you may contact me Ms. Shanda Johnson at (908) 789-3469 or by email: shanda.johnson@rutgers.edu. You can also contact my faculty advisor, Dr. Karen T. D'Alonzo, PhD, RN if you have questions.

She can be reached at:

Rutgers, The State University of New Jersey
College of Nursing
110 Paterson Street, Room 301
New Brunswick, NJ 08901
Phone (848) 932-7700 Ext. 6145
FAX: (848) 932-6145
Email: kdalonzo@rutgers.edu

If you have any questions about your child's rights as a research participant, you may contact the Rutgers University IRB Administrator at:

Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Program:

3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: (848) 932-0150
Email: humansubjects@orsp.rutgers.edu

You will be given a copy of this assent form for your records.

By participating in this study/ these procedures, you agree to be a study subject.

Student Signature

Date

Student Identity Code

Parental Consent Form

Dear Parent or Guardian:

My name is Shanda Johnson, I am a doctoral student and a PhD candidate at Rutgers University. I have been given permission to conduct my dissertation research study at Plainfield High School for the purpose of determining the relationship between stress, neighborhood safety, cultural beliefs, family values on weight, and waist circumference measurements among Hispanic adolescent females. I have briefly explained the study to your child. In order for your child to participate in this study, she must return a signed copy of this parental consent. Also she will be asked to sign a students' assent form, acknowledging her agreement to participate in the study. My faculty advisor, Dr. Karen T. D'Alonzo, from Rutgers the State University, College of Nursing, will supervise my study.

Description of the Study

Students who participate in this study will be given four brief questionnaires that asks about their personal feelings, feelings about safety in the neighborhood where they live, beliefs related to their ethnic background, values that their family feel are important, and demographic questions regarding their age, ethnic culture, and leisure time activities. Your child's responses to the questionnaires will take place in the school health classroom setting and take approximately 40 minutes to complete. Your child will be asked to have her height, weight, and waist circumference taken privately in the school nurse's office by me or by my research assistant and recorded on a form with your child's assigned identity code.

Confidentiality of Participant Information

Information that your child puts on the questionnaires will be held in strict confidence. Your child will not put her name on any of the questionnaires. Instead of using her name, she will be given an identity code that is to be written on each questionnaire. Your child will be asked to sign an assent form to participate in the study but it will be separated from their questionnaires and be placed in a locked file in my office. If your child indicates at any time that she wants to stop filling out the questionnaires, she will be thanked for her participation and allowed to discontinue her participation immediately.

The research team and the Institutional Review Board (a committee that reviews research studies in order to protect research participants) at Rutgers University are the only parties that will be allowed to see your child's responses to the questionnaires,

except as may be required by law. If a report of this study is published, or the results are presented at a professional conference, only group results will be stated, and reported.

Risks, Inconveniences, and Discomforts

There are no foreseeable physical risks to participation in this study. Your child's grade will not be affected in any way, whether or not she participates in the study.

Benefits

Your child will not benefit directly from participation in this study. Except, if your daughter is the recipient of a winning raffle ticket, and prize. Then, your daughter will receive a gift for her participation in the study. Furthermore, the information collected may lead to increased understanding of the factors that influence how adolescent girls feel about themselves and how they relate to others.

If you would like to have a report of the study when it is completed, please indicate this at the bottom of this form and return a self-addressed envelope to be used to send you a summary of the study. Also, please retain the attached copy of this consent form for your record.

Questions

If you have any questions about the research, you may contact me Ms. Shanda Johnson at (908) 789-3469 or by email: shanda.johnson@rutgers.edu. You can also contact my faculty advisor, Dr. Karen T. D'Alonzo, PhD, RN if you have questions.

She can be reached at:

Rutgers, The State University of New Jersey
College of Nursing
110 Paterson Street, Room 301
New Brunswick, NJ 08901
Phone (848) 932-7700 Ext. 6145
FAX: (848) 932-6145
Email: kdalonzo@rutgers.edu

If you have any questions about your child's rights as a research participant, you may contact the Rutgers University IRB Administrator at:

Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Program:

3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: (848) 932-0150
Email: humansubjects@orsp.rutgers.edu

Consent

Your child's participation in this study is completely voluntary. Please sign and return the attached permission slip if you are willing to have your child participate. You will be given a copy of this consent form for your records.

Your support is greatly appreciated.

Sincerely,

Ms. Shanda Johnson, RN, MSN, APN-C, FNP, PhD(c)
Principal Study Investigator

Your child will also be asked if they wish to participate in this study.

Sign below if you agree to allow your child to participate in this research study:

Name of Child (Print) _____

Name of Parent/Legal Guardian (Print) _____

Parent/Legal Guardian's Signature _____ Date _____

Principal Investigator Signature _____ Date _____

Please check one of the choices below to indicate if you would like to receive a report of the study when it is completed.

_____ YES

_____ NO

Forma paternal de permiso

Estimados Padres/Guardianes:

Soy una estudiante doctoral y un candidata de doctorado en la Universidad de Rutgers. He sido dado permiso a realizar mi estudio de investigación de disertación en New Brunswick High School and New Brunswick Science and Technology High School. Los directores del New Brunswick High School and New Brunswick Science and Technology High School me han dado permiso a contactarles a solicitar permiso para su niño para tomar parte en el estudio acerca de varias condiciones que influyen la salud. Les explicaré el estudio a los estudiantes que han regresado este forma de permiso, y yo también les pediré que tomen parte en el estudio.

La descripción del estudio

Antes de recogida de datos, habrá un período de clase de 30 minutos donde el estudio será explicado a las estudiantes. Las estudiantes que deciden tomar parte en este estudio será dado tres cuestionarios breves con respecto a sus sentimientos acerca de la seguridad de vecindario, acerca de la aculturación, y acerca de las relaciones familiares. También ellas recibirán una forma con preguntas con respecto a su edad y el grado. Pero ninguna información identificable, como nombre, ni los números del seguro social serán incluidos. El paquete de tres cuestionarios y la hoja de datos tomará acerca de 40 minutos de completar. Si la estudiante decidió que ella no quiere continuar, ellas pueden parar inmediatamente.

Los riesgos, y los inconvenientes, y molestias

No hay riesgos físicos a la participación en este estudio. El grado de su niño no será afectado en ninguna manera, sin tener en cuenta si toma parte en el estudio.

Beneficias

Su niño no beneficiará directamente de participación en este estudio. Sin embargo, la información completa puede llevar a la comprensión aumentada de los factores que influyen cómo adolescentes se sienten acerca de sí mismos y cómo relacionan a otros.

El anonimato de información de participantes

Esta investigación es anónima. Las palabra anónimo significa que yo no pediré información sobre su niña que podría identificar a ella. Esto significa que los nombres de los participantes de estudio, las direcciones, los números de teléfono, la fecha de nacimiento, etc. no parecerán en los resultados. El equipo de investigación y la Revisión Institucional Abordar (un comité que revisiones investigan estudios para proteger investigación participantes) en la Universidad de Rutgers son los únicos grupos que serán

permitidos a ver las respuestas a los cuestionarios, sino como puede ser requerido por la ley. Si un informe de este estudio es publicado, o los resultados son presentados en una conferencia profesional, sólo resultados de grupo serán indicados, y serán informados.

Las preguntas

Si tiene cualquier pregunta acerca de la investigación, puede contactarme en (908) 789-3469 o por correo electrónico, mareleci@pegasus.rutgers.edu. Usted también puede contactar a mi consejero de facultad, Dr. Karen T.D'Alonzo , si tiene preguntas en:

Rutgers, The State University of New Jersey
College of Nursing
110 Paterson Street, Room 301
New Brunswick, NJ 08901
Phone (848) 932-7700 Ext. 6145
FAX: (848) 932-6145
Email: kdalonzo@rutgers.edu

Si tiene cualquier pregunta acerca de los derechos de su niño como un participante de investigación, puede contactar al Administrador de la Universidad de Rutgers IRB en:

Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Program
3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: 848-932-0150
Email: humansubjects@orsp.rutgers.edu

Consienta

La participación de su niña en este estudio es completamente voluntaria. Firme por favor y regrese el forma conectado de permiso si está dispuesto a tener a su niño participa. Su apoyo es apreciado mucho.

Sinceramente,

la Sra. Shanda Johnson, RN, MSN, APN-C, FNP, PhD(C)

Su niño también será preguntado si desean tomar parte en este estudio. Será dado una copia de esta forma de consentimiento para sus registros. Firme abajo de si concuerda en permitir su niño para tomar parte en este estudio de investigación:

El nombre de Niño _____

Nombre de Guardián de Padre/Legal _____

Firma de Padre/Legal Guardián _____

Fecha _____

Firma de la Investigadora Principal _____

Fecha _____

Student Consent for Study Participation

You are invited to participate in a research study that is being conducted by Ms. Shanda Johnson who is a doctoral candidate and a part-time faculty member in the Nursing Department at Rutgers University. The purpose of this research is to examine the relationship of neighborhood safety, cultural beliefs, and family values on weight, and waist circumference measurements among Hispanic adolescent females. Dr. Karen T. D'Alonzo faculty advisor from Rutgers the State University, College of Nursing, will supervise the study.

Your participation in this study will include responding to questions about safety in the neighborhood where you live, beliefs related to your ethnic culture, values that your family feel are important, and demographic questions regarding your age, ethnic culture, and leisure time activities. Your response to the questionnaires will occur in the health class setting and take approximately 30 minutes to complete. You will then be asked to have your height, weight, and waist circumference taken privately in the nurse's office by me or by my research assistant and recorded on a form with your ID code.

Information that you put on the questionnaires will be held in strict confidence. You will not put your name on any of the questionnaires. Instead of using your name, you will be assigned an identity code that is to be written on each questionnaire. You will be asked to sign the student consent to participate in the study. The student consent will be separated from your questionnaires and be placed in a locked file in my office.

The research team and the Institutional Review Board (a committee that review research studies in order to protect research participants) at Rutgers University are the only parties that will be allowed to see the information you give, except as may be required by law. If a report of this study is published, or the results are presented at a professional conference, only group results will be stated. All study information from the questionnaires and height, weight, and waist circumference information will be kept for five years in a locked file in my office.

There are no foreseeable risks to participation in this study. In the outside chance that you become upset answering any of the questions, you will have the opportunity to speak with the school nurse or one of the counselors in your school. In addition, you may receive no direct benefit from taking part in this study. Except, if you are the recipient of a winning raffle ticket, and prize. Then you will receive a gift for your participation in the study.

Participation in this study is voluntary. You may choose not to participate, and you may withdraw at any time during the study procedures without any penalty to you. In addition, you may choose not to answer any questions with which you are not comfortable.

If you have any questions about the research, you may contact me Ms. Shanda Johnson at (908) 789-3469 or by email: shanda.johnson@rutgers.edu. You can also contact my faculty advisor, Dr. Karen T. D'Alonzo, PhD, RN if you have questions.

She can be reached at:

Rutgers, The State University of New Jersey
College of Nursing
110 Paterson Street, Room 301
New Brunswick, NJ 08901
Phone (848) 932-7700 Ext. 6145
FAX: (848) 932-6145
Email: kdalonzo@rutgers.edu

If you have any questions about your child's rights as a research participant, you may contact the Rutgers University IRB Administrator at:

Rutgers University Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Program:

3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: (848) 932-0150
Email: humansubjects@orsp.rutgers.edu

You will be given a copy of this student consent form for your records.

By participating in this study/ these procedures, you agree to be a study subject.

Student Signature

Date

Student Identity Code

Appendix I

Centers for Disease Control and Prevention BMI Measurements

School	Grade
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Vita

Shanda Johnson

1975	Born December 2, 1975 I Newark, New Jersey
1993	Graduated from Scotch Plains-Fanwood Regional High School
1997	Graduated from Rutgers the State University, College of Nursing, B.S.
1997-2009	Employed at JFK Medical Center Edison, New Jersey Staff Nurse
2001	Inducted into Sigma Theta Tau International Nursing Honor Society
2001	Graduated from Rutgers, Graduate School Newark, M.S.
2005-2010	Employed at Pediatric Complete Care Family Nurse Practitioner
2005-2013	Nursing Clinical Adjunct Faculty Rutgers College of Nursing
2006-2012	Employed at Minute Clinic, LLC Family Nurse Practitioner
2009	Robert Wood Johnson Foundation NJ Nursing Initiative Scholar
2010	Kirby Award for Academic Excellence
2010-Present	Employed at Dr. A. Kishen Pediatrics, LLC Family Nurse Practitioner
2013	Dr. Bobbie Jean Perdue Urban Spirit Award for Outstanding Service and Leadership 2013
2014	Sigma Theta Tau, Alpha Tau Chapter Spring 2014 Research Award
2014	Ph.D., Nursing Rutgers, Graduate School Newark