

© 2013

Suzanne M. Keep

ALL RIGHTS RESERVED

THE RELATIONSHIP AMONG SOCIETAL NORMS, EXERCISE

Factors affecting commitment to a plan of physical activity among low-income

Hispanic mothers and their daughters

By

Suzanne M. Keep

A Dissertation submitted to the

Graduate School-Newark Rutgers, The State University of New Jersey

in partial fulfillment of the requirements

for the degree of Doctor of Philosophy

Ph.D. Program in Nursing

Written under the direction of

Karen D'Alonzo Ph.D., RN, APNC Chairperson

and approved by

Newark, New Jersey
May 2013

ABSTRACT OF THE DISSERTATION

Factor Affecting Commitment to a Plan of Physical Activity,

Among low-income

Hispanic Mothers and Daughters

By SUZANNE M. KEEP

Dissertation Director:

Karen D'Alonzo PhD, RN, APNC

The purpose of this research was to examine the relationships among societal norms, exercise self-efficacy and activity related affect on commitment to a plan of physical activity in a sample of low-income Hispanic women and their daughters. Theoretical propositions derived from the Health Promotion Model (Pender, 2011) were tested.

The first hypothesis, which stated there would be a significant relationship between societal norms and commitment, was partially supported. The second hypothesis, which stated there would be a significant relationship between exercise self-efficacy and commitment, was partially supported. The third hypothesis, which stated there would be a significant relationship between related affect and commitment to a plan of physical activity, was partially supported. The fourth hypothesis, which stated there would be significant relationship between commitment to a plan of physical activity and participation in physical activity, was partially supported. The fifth hypothesis, which stated there would be a significant relationship between societal norms, self-efficacy, activity related affect and commitment to a plan of physical activity of mothers will be significant predictors of physical activity levels of the daughters, was partially supported. The sixth hypothesis, which stated there would be a significant differences in societal

THE RELATIONSHIP AMONG SOCIETAL NORMS, EXERCISE

norms, exercise self-efficacy, activity related affect and commitment to exercise between Hispanic women and their daughters was partially supported. Evidence in support of these hypotheses was found among daughters, in relation societal norms and exercise self efficacy, but not mothers. Data was collected at area Hispanic churches. (N= 79) Hispanic mothers and (N= 79) Hispanic daughters. A correlational designed was used. Kendall's tau_b was used to assess differences between means of mothers and daughters. Actigraph® were used in this study for quantitative measurements, which demonstrated low levels of physical activities among mothers and daughters, with both mothers and daughters being in sedentary activity (71%) while they wore the actigraph. Multiple regression did not reveal significant relationships between societal norms, exercise self-efficacy and physical activity enjoyment on a commitment to physical activity with the mothers, and the $R^2 = .04$ which explains only 4% of the variance for mothers' commitment for physical activity. Multiple regression did however real a relationship between the daughters' independent variables, societal norms, $\beta = .28$, $p = .01$; and exercise self-efficacy, $\beta = .25$, $p = .02$. The total $R^2 = .213$ which explains 21% of the variance for the daughters' commitment for PA, which is not a strong predictor for commitment of physical activity. Limitations of this study was the language barrier, limited access to Actigraphs®, and seasonal winter months may have reduced physical activity. Further research is needed with the Hispanic population especially with the key predictor variable of being physically active, exercise self-efficacy. Implication for nurses include education for why and how to be physically active, and to provide physically activity programs that are culturally specific for this population that would provide enjoyment and therefore a commitment to physical activity.

THE RELATIONSHIP AMONG SOCIETAL NORMS, EXERCISE

Acknowledgement and Dedication

The accomplishment of this dissertation reflects the knowledge, expertise and support of many people. I am forever grateful for their assistance and support. My deepest thanks and appreciation to:

Dr. Karen D'Alonzo, PhD, RN, APNC, my chairperson whose theoretical knowledge, expertise in dissertation direction and guidance, and support and encouragement made this dissertation come to fruition. Despite her responsibilities, her academic and professional commitments, she was always available to me.

Dr. Elise Lev EdD, RN and Dr. Felesia Bowen, DNSc, APN, RN my committee members for their guidance and encouragement throughout this process.

Dr. Lee Dicker, PhD, whose statistical expertise guided me in telling “my story”. I appreciate your patience and support with me, and your encouragement.

Father Steven Cron, Father Stephen Dudek, and Father Charlie Brown who supported my study and for letting me collect data at their churches.

Michigan State University for support the use of the Actigraphs®, Shorr Board and Scale.

Meijer, for their donation of \$600.00 in gift cards.

Sigma Theta Tau for their \$500.00 scholarship.

Susan Harrington PhD, RN, Grand Valley State University for her support with analyzing the Actigraph® data.

The students at Catholic Central for volunteering on the weekends.

Kristi George NP, RN for her continual support and wisdom.

Sr. Linda Thiel OP for her guidance and support and belly laughs. I am especially grateful for her kind words of encouragement and her prayers.

For my “Phab 5” colleagues, especially Kristen, Patti, and Jeanine.

My sister Barbara Hile and her husband Earl Hile, and my niece Katie Hile for their continued support and encouragement from the beginning. I am forever grateful for their assistance Sunday mornings at the various churches, and lugging around equipment for me. I also appreciate Katie’s skills and assistance with the computer.

My sister Kathleen Steiner for her support and technical typing skills.

THE RELATIONSHIP AMONG SOCIETAL NORMS, EXERCISE

My mother Delphine Robertson who at 80 is a nurse and is still working, she truly is my inspiration.

My children Sarah for her support, computer skills and assistance, Caroline for her words of encourage and support, and for John for his comic relief.

Last, and most of all to my husband Paul whose unwavering love, support and encouragement have been exactly what I needed in pursuing my PhD.

THE RELATIONSHIP AMONG SOCIETAL NORMS, EXERCISE

TABLE OF CONTENTS

I.	Introduction: The Problem	1
A.	Physical Activity	2
B.	Physical Activity Among Hispanic Women	6
C.	Physical Activity and Self-Efficacy	7
D.	Physical Activity and Societal Norms	7
E.	Physical Activity and Activity Related Affect	9
F.	Commitment to Physical Activity	9
G.	Statement of Problem	10
a.	Subproblems: Among Low-income Hispanic Women and their Daughters	
H.	Definition of Terms	11
a.	Behavior Specific Cognitions and Affect	11
b.	Interpersonal Influences: Societal Norms	11
c.	Exercise Self-Efficacy	12
d.	Activity Related Affect	13
e.	Commitment to a Plan of Action	14
f.	Behavioral Outcomes – Health Promoting Lifestyle Behaviors	15
I.	Delimitations	17
J.	Significance of the Study	17
II.	Review of the Literature	20
A.	Theoretical Framework	20
B.	Behavior Specific Cognitions and Affect	24

THE RELATIONSHIP AMONG SOCIETAL NORMS, EXERCISE

a.	Interpersonal Influences (Societal Norms)	24
b.	Perceived Exercise Self-Efficacy	25
c.	Activity Related Affect	27
d.	Commitment to a Plan of Action	27
C.	Empirical Support	28
a.	Societal Norms	28
b.	Exercise Self-Efficacy	32
c.	Activity Related Affect	37
d.	Commitment to a Plan of Action for Exercise	39
D.	Conclusion	40
E.	Hypothesis	42
F.	Theoretical Rational	42
III.	Methodology	44
A.	Research Setting	44
B.	Design	45
a.	Sampling Methods	45
b.	Sample Size	47
C.	Instruments	47
a.	Demographic Questionnaire	48
b.	Acculturation Scale	49
c.	Anthropometric Measures	50
d.	Measures of Physical Activity	51
i.	Accelerometer	51

THE RELATIONSHIP AMONG SOCIETAL NORMS, EXERCISE

ii. Physical Activity Recall	52
e. Lifestyle Profile II	53
f. Exercise Norms Scale	55
g. Exercise Self-Efficacy	56
h. The Physical Activity Enjoyment Scale	59
i. Planning Commitment for Exercise	61
D. Data Analysis Plan	62
IV. Analysis of the Data	65
A. Statistical Description of the Variables	66
a. Demographic Variables	66
b. Exercise Norms Scale	67
c. Exercise Self-Efficacy	67
d. Physical Activity Enjoyment Scale	68
e. Planning for Commitment for Exercise	68
f. SASH	70
g. Anthropometric Measures	71
h. Actigraph Data	72
i. Self-Report Physical Activity	74
B. Psychometrics of Instruments in Study	75
C. Hypotheses Testing	76
a. Hypothesis 1	76
b. Hypothesis 2	77
c. Hypothesis 3	77

THE RELATIONSHIP AMONG SOCIETAL NORMS, EXERCISE

d. Hypothesis 4	78
e. Hypothesis 5	79
f. Hypothesis 6	80
D. Additional Ancillary Findings	82
V. Discussion of Findings	91
A. Exercise Norms and Commitment	91
B. Exercise Self-Efficacy and Commitment	92
C. Physical Activity Related Affect and Commitment to Physical Activity	94
D. Lifestyle Profile, Adolescent Lifestyle Profile, Physical Activity Record, Physical Activity and Commitment	96
E. Social Norms, Exercise Self-Efficacy, Physical Activity Enjoyment Related to Commitment	97
F. Societal Norms, Self-Efficacy, Activity Related Affect as Predictors to a Commitment for a Plan of Activity	98
G. Ancillary Findings	98
VI. Summary, Conclusions, Implications, and Recommendations	100
A. Summary	100
B. Limitations	105
C. Conclusions	105
D. Implications for Practice	106
E. Recommendations	110
References	112

THE RELATIONSHIP AMONG SOCIETAL NORMS, EXERCISE

List of Tables

Table 1: Definition of Physical Activity USDHHS 2008	3
Table 2: Body Mass Index for Adults	50
Table 3: Body Mass Index for Children	51
Table 4: Descriptive Statistics of the Study Variables	69
Table 5: Description of paired <i>t</i> -tests for mother (M)-daughter (D) pairs	70
Table 6: Description of mother and daughter weight and BMI according to CDC BMI measurements	72
Table 7: Alpha Coefficients for Instruments in Study	75
Table 8: Multiple Regression Analysis for Mothers' Commitment for Physical Activity with Variables: exercise self-efficacy, societal norms, and physical activity related affect	81
Table 9: Multiple Regression Analysis for Daughters' Commitment for Physical Activity with Variables: exercise self-efficacy, societal norms, and physical activity related affect	82
Table 10: Multiple Regression Analysis for Mothers' Commitment for Physical Activity with variables: exercise self-efficacy, lifestyle promotion, societal norms, acculturation, activity related affect and age.	83
Table 11: Multiple Regression Analysis for Daughters' Commitment for Physical Activity with variables: exercise self-efficacy, lifestyle promotion, societal norms, acculturation, activity related affect and age.	85
Table 12: Multiple Regression Analysis for Mothers' Actigraph with variables: age, educational level, hours of sleep, years living in the U.S., BMI.	86

THE RELATIONSHIP AMONG SOCIETAL NORMS, EXERCISE

Table 13: Multiple Regression Analysis for Daughters Actigraph with Variables: age, educational level, hours of sleep, years living in the U.S., BMI.	87
Table 14: Multiple regression for mothers' PAR, self-report PA, and commitment on Actigraph®.	89
Table 15: Multiple regression for daughters' PAR, self-report PA, and commitment on Actigraph®.	
List of Figures	
Figure 1: Pender's Health Promotion Model with Variables Used in Study	16
Figure 2: Revised Pender Health Promotion Model	23
References	112
Appendices	130
A. Announcement	130
B. Informed Consent	132
C. Demographic Form	141
D. Short Acculturation Scale for Hispanics	142
E. Anthropometric Form	152
F. Physical Activity Record	153
G. Declaration of Conformity for Accelerometer	154
H. Lifestyle Profile II	155
I. Exercise Norms Scale	159
J. Exercise Self-Efficacy	160
K. Physical Activity Enjoyment	166

THE RELATIONSHIP AMONG SOCIETAL NORMS, EXERCISE

L. Planning for Exercise	168
M. Descriptions of Variables	170
N. Letters of Support	176
O. Curriculum Vitae	178

CHAPTER 1

Introduction: The Problem

Obesity and physical inactivity are two of the top ten major public health issues facing adults and children today in the United States (U.S.) (U.S. DHHS, 2008). Obesity and physical activity (PA) are also listed in the top twelve topics of leading health indicators in Healthy People 2020

(www.healthypeople.gov/2020/LHI/2020indicators.aspx retrieved July 1, 2012).

Physical inactivity is a major risk factor for several causes of death from non-communicable diseases (Kohl, et al., 2012), such as coronary heart disease, stroke, diabetes and several cancers (Gulsvik, et al., 2012; Hahn, Marks, Teutsch, & Rothenberg, 1990; Hallal, et al., 2012), and is the fourth leading cause of global mortality (Kohl, et al., 2012). This significant statistic demonstrates that physical inactivity is a major risk factor for health issues, and should be considered to have the same level of health concern as smoking, blood cholesterol, and obesity (Hallal et al., 2012; Sallis et al., 1999). A major health-promoting factor across all age groups is PA, which is inversely associated with mortality in the general population (Gulsvik, et al., 2012). Although it is clear that being physically active reduces the risk of all causes of mortality, it is unclear how much PA is needed to have the most significant benefit in reducing mortality. In a systematic review of PA and all-cause mortality, risk reduction of mortality was greatest among those with vigorous PA, and to a lesser extent, mortality was reduced among those who were engaged in moderate intensity PA (Samitz, Effer & Zwahlen, 2011). However, contraindicating the Samitz et al., (2011) study, a systematic review and meta-analysis of cohort studies related to PA and lower mortality (Woodcock, Franco, Orsini & Roberts,

2011), it was found that being physically active reduces the risk of mortality, with the greatest benefit being increasing activity from no activity to low activity.

Health-risk behaviors, including physical inactivity, contribute to leading causes of morbidity and mortality among youth and adults. The behaviors are often established during childhood and adolescence and continue into adulthood. Oftentimes health risks are interrelated, such as inadequate physical activity and obesity and are preventable (MMWR, 2012). A major factor contributing to the childhood obesity epidemic is inadequate PA among children and adolescents (Howard, 2007). Although regular PA is a critical behavioral element to promote and maintain health (Robinson, 1999), and planned PA has been documented as a method to counteract overweight and obesity, the majority of youths in the U.S. are not meeting the national recommendations for PA (Centers for Disease Control [CDC], 2009).

Physical activity.

Physical activity has been defined as any body movement produced by skeletal muscle that increases energy expenditure above a basal level that enhances health (USDHHS, 2008). Physical activity that enhances health includes moderate-intensity activities, such as softball or skateboarding, and vigorous-intensity activities, such as jumping rope or running (USDHHS, 2008). The specific guidelines for habitual PA for young people between the ages of 6-17 years are 60 minutes per day of: (1) moderate-intensity or vigorous-intensity aerobic activity, seven days of the week; (2) muscle strengthening activities such as gymnastics or push-ups at least three days a week; and (3) bone strengthening activities such as jumping rope or running at least three days per week as part of the 60 or more minutes (CDC, 2011; USDHHS, 2008). Moderate intensity is

defined as activities that will make the heart beat much faster than normal and breathing will be harder than normal, and with vigorous-intensity, the heart will beat much faster than normal and breathing will be much harder than normal (CDC, 2012). Refer to Table 1 for a description of type of physical activity for children and adults.

Table 1

Physical Activity

Type of Activity	Age Group of Children	Age Group Adults
Moderate intensity Aerobic	Active recreation, such as hiking, skateboarding, rollerblading Bicycle riding Brisk walking	Active recreation such as canoeing, skateboarding, rollerblading, Brisk walking, bicycle riding, stationary or road biking Housework and yard work, such as pushing a lawn mower, games that require catching and throwing balls, such as baseballs and softballs
Vigorous intensity Aerobic	Active games involving running and chasing such as tag, bicycle riding, jumping rope, martial arts, such as karate, running sports such as soccer, ice or field hockey, basketball swimming, tennis	Active games involving running and chasing such as Flag football Bicycle riding Jumping rope martial arts, such as karate, running sports such as soccer, ice or field hockey, basketball swimming, tennis
Muscle strengthening	Games such as tug-of-war Modified push-ups Resistance exercises using body or resistance bands Rope tree or climbing wall	Games such as tug-of-war push-ups and pull ups Resistance exercises with exercise weight machines, hand held weights

	Si-ups (curl ups or crunches), swinging on the playground	Climbing wall Sit-ups, (curl ups or crunches)
Bone strengthening	Games such as hopscotch, hopping, skipping, jumping, jumping rope, running, sports	Hopping skipping jumping rope, running sports

Note: Adapted from (USDHHS, 2008)

Findings from the Youth Media Campaign (YMC) conducted by the CDC, indicated that many young persons are not physically active (defined as not having participated in at least 60 minutes of physical activity on any day). The racial and ethnic breakdown of children 9-13 years who were not achieving 60 minutes of physical activity on any day in the YMC was highest among Black (19.6%) and Hispanic (15.9%) students, and particularly high among Black females (26.7%) and Hispanic females (21.3%). As female students progressed through high school, the prevalence of inactivity for 60 minutes on any day increased: among 9th graders (13.9%), 10th graders (17.9%), 11th graders (19.0%) and 12th graders (20.6%) (MMWR, 2012).

These statistics are troublesome, given the fact that children are generally the most physically active subgroup of the population (fitness.gov/betterhealth/ppar.pdf). It is unclear how PA patterns are established in early childhood (Crossman, Sullivan, and Benin, 2006): the determinants of PA among children into adolescence vary in significance with developmental changes, are not well understood and are difficult to measure (Sallis & Owen, 1999). There is a notable decline in PA participation among girls beginning as early as the age of 10 years (Craggs & Corder, DHHS, 1996; Kimm, et al., 2002; vanSluijs, & Griffin, 2011). The study of the decrease in PA among the youth is hindered due to limited external validity, and the lack of valid measures of PA (Hearst, Patnode, Sirard, Farbakhsh, and Lytle, 2012).

Physical inactivity of Hispanic females is of particular concern. Only 33% of Hispanic high school girls reported they were physically active at least 60 minutes per day on five or more days (CDC, 2011). Both first and second generation Hispanic immigrant children are less likely to be physically active and engage in regular PA compared to U.S. born Non-Hispanic children (Singh, Yu, Siahpush, Kogan, 2008). Hispanic women have historically not been encouraged to be physically active or self-motivated to be physically active (Im, Lee, Hwang, Yoo, Chee, Stuifbergen, Walker et al., 2010).

A majority of parents do not engage in sufficient amounts of PA themselves. The basic PA recommendations for adults from the American College of Sports Medicine (ACSM) and the American Heart Association (AHA) are lower than the requirement for children. For parents, PA requirements are: (1) activity that increases the heart rate for at least 30 minutes a day five days a week (at least 150 minutes per week); or (2) vigorous intense aerobic exercise 20 minutes a day three days a week. In addition, it is recommended for adults to engage in eight to 10 strength training exercises, eight to twelve repetitions of each exercise two times a week (Haskell et al., 2007). PA guidelines for Americans report for additional and more extensive health benefits, adults should increase their PA level to 300 minutes a week of moderate-intensity or 150 minutes a week of vigorous-intensity aerobic PA (USDHHS, 2008). Refer to Table 1 for explanation of types of PA for adults. Less than half (49.1%) of U.S. adults met the CDC/ACSM PA recommendation. These recommendations notwithstanding, less than half of the women (47.9%) were less likely to meet the standard than men (50.7%) (Haskell et al., 2007).

Physical activity among Hispanic women

Recent 2010 Census Bureau data demonstrated a 43% increase in the size of the Hispanic population since 2000 indicating that Hispanics now comprise the largest minority group in the United States (US) (2010 Census Data, 2011). With regard to PA, Hispanic adults have the highest inactivity rates (51.3%) among all ethnic and racial groups (HealthyPeople.gov, 2012, [http://minority health.hhs.gov](http://minorityhealth.hhs.gov), 2011,). Hispanic women also have higher obesity rates compared to the general population; 78% are overweight or obese (minorityhealth.hhs, 2012), and have a disproportionate health risk for diseases linked with physical inactivity such as diabetes and cardiovascular disease (Vorhees & Young, 2003).

Although PA rates are lower for Hispanic women, the type of PA in question may influence adherence to recommendations. Hispanic women may not perceive or conceptualize PA in the same manner as other groups of women. Hispanic women are more likely to engage in occupational activities which involves walking, and housework activities rather than regular planned PA (Brownson, Eyler, King, Brown, Shyu, Sallis, 2000). In the Hispanic culture, emphasis is placed on the group rather than the individual, so that the family's needs are prioritized above individual needs (Marquez & McAuley, 2006). It has been suggested that among Hispanic women, dedication to family is the driving force with which they structure and schedule their daily activities (Berg, Cromwell, and Arnett, 2002). Cultural-specific beliefs about PA among Hispanic women often reflect the principle that family duties and church preclude any involvement with PA. For many Hispanic women, the concept of "leisure time" without any responsibility is a fallacy (Tortolero et al., 1999). With relatively little discretionary

personal time, Hispanic women may choose to participate in more sedentary leisure time activities. For example, Berg (2002) noted that many Hispanic women enjoy watching television novellas (soap operas) as a form of entertainment (Berg, 2002).

Physical activity and self-efficacy

Self-efficacy has been studied in relationship to PA and it has been found that self-efficacy is uniformly a predictor of diverse forms of behavior such as health promotion and participation in regular physical activity (Eyler, Wilcox, Matson-Koffman, Evenson, Sanderson, Thompson, Wilbur, and Rohm-Young, 2002; Bandura 1997) and has been found to be the most consistent psychosocial correlate of PA (Trost, Own, Bauman, Sallis & Brown, 2002). Exercise self-efficacy has been reported to be a common correlate of PA for Latinos (Marquez, McAuley, and Overman, 2006). Individuals who have a strong self-efficacy and confidence to be physically active are more likely to engage in physical activities (Kim, 2007). However, there have been limited studies on self-efficacy related to PA among minority pre-adolescents and women. Most studies of PA correlates have been conducted among biased samples of non-Hispanic Whites.

Physical activity and societal norms

Another psychosocial factor that can positively influence healthy PA and can improve self-efficacy is societal norms (Fleury & Lee, 2006). Societal norms are expectations of significant others, and set values for performance that individuals may embrace or reject (Pender et al., 2011). Societal norms enable individuals to understand acceptable behaviors within their peer group and provide groups with examples of desirable behaviors (Fleury & Lee, 2006). Research has shown that Latinas may feel

inspired to be physically active by knowing others who are physically active, or by associating with women who are active in their neighborhood (societal norms) (Eyler, Matson-Koffman, et al., 2003). Societal norms, in the form of support for exercise from family and friends may be an important factor in promoting PA, however, studies are lacking that have examined the relationship between societal norms and PA among Hispanic pre-adolescents and women. In a focus group study (Berg, et al., 2002), many Mexican American women stated they needed the approval of family members, especially their husbands, to start a PA program. Societal norms may provide women with values, motivation, and skills to participate in PA (Fleury & Lee, 2006).

In some cultures, interpersonal skills may be of significant importance as societal norms. One example is the concept of familism /*familismo* among the Hispanic population, in which an individual might engage in a particular behavior for the good of the family rather than for personal gain (Pender, et. al., 2011). *Familismo* is defined as family expectation that family members (including intergenerational and extended kin) experience closeness, cohesion, and interdependence. This relationship is a primary source of support and commitment to the family over individual needs and desires (acf.hhs.gov). The strong emphasis on the family unit leads family members to depend on each other and individuals will tend to make decisions based on what will please the family. In mother-daughter relationships, it is expected that the daughter will comply with the mother's wishes (Dixon, Graber, & Brooks-Gunn, 2008). Because Latino families encourage family interdependence and place importance on obedience and respect of parental authority, (Dixon, et al., 2008), daughters may be more likely to listen to the advice of their mothers and may be more apt to exercise with their mothers. Due to

the traditional cultural values of the Latina population, mothers and daughters often develop lifelong bonds and rely on each other for advice and support over a lifespan (Dixon, et al., 2008).

Physical activity and activity related affect

Activity related affect is another psychosocial factor that has been linked with increased participation in PA. Activity related affect is defined as the subjective feeling one has when anticipating PA, or the feeling experienced during or following the specific PA (Pender et al., 2011). In particular, the state of feeling experienced after the PA in particular is likely to determine whether or not the activity will be continued or maintained (Pender et al., 2011). PA and activity related affect may change over time. Activities enjoyed during childhood may not be carried over into adulthood (Sallis & Owen, 1999). To promote activity related affect, Delgado (2010) suggests that physical activities such as dancing may be more enjoyable and attainable for Hispanic women. Activity related affect has a significant impact on whether or not a person is likely to participate in PA.

Commitment to physical activity

The commitment of parents and caregivers to support children to engage in physical activity is vital for children to maintain or achieve a healthy weight and to prevent obesity. Commitment to a plan of action is necessary to initiate a behavior event and is defined as a two-fold process: (1) commitment to carry out a specific action at a given time and place and with specified persons or alone, regardless of competing preferences; and (2) identification of specific strategies that are necessary for carrying out and reinforcing the new behavior (Pender et al., 2006). Without a strategy, it is postulated

that the commitment will only be a “good intention” (Pender et al., 2006). Without a level of commitment, the physical activity plan will likely not take place. Low levels of self-efficacy in Hispanic adolescents and women could help explain low levels of PA in these groups (Marquez & McAuley, 2006).

Statement of the Problem

Problem Statement: What are the relationships among societal norms, exercise self-efficacy and activity related affect, on commitment to a plan of physical activity among low-income Hispanic women and their daughters?

Subproblems: Among low-income Hispanic women and their pre-adolescent daughters:

1. What is the relationship between societal norms and commitment to a plan of physical activity?
2. What is the relationship between exercise self-efficacy and commitment to a plan of physical activity?
3. What is the relationship between activity related affect and commitment to a plan of physical activity?
4. What is the relationship between commitment to a plan of physical activity and participation in physical activity?
5. Are societal norms, self-efficacy, activity related affect, and commitment to a plan of physical activity of the mothers predictors of physical activity levels of the daughters?

6. Are there differences in societal norms, exercise self-efficacy, activity related affect and commitment to exercise between Hispanic women and their daughters?

Definition of Terms

This section will summarize the theoretical and operational definitions of variables from Pender's Health Promotion Model (HPM) that will be used in this study (Pender et al., 2011). These selected variables include societal norms, exercise self-efficacy, activity related affect and commitment to a plan of action for physical activity.

Behavior-Specific Cognitions and Affect

Interpersonal influences: societal norms.

Interpersonal influences are "the cognitions involving behaviors, beliefs or attitudes of others" (Pender, et al., 2011). These cognitions may be real or unreal. Interpersonal influences have an effect on health-promoting behaviors and the primary source of these influences is family, peers, and health care providers. There are three interpersonal influences in particular that have an effect on engaging in health-promoting behaviors: societal norms, social support, and modeling (Pender et al., 2011). For the purpose of this study, only societal norms will be measured. Societal norms are theoretically defined as set standards for performance that individuals may adopt or reject (Pender et al., 2011). The HPM proposes that interpersonal influences affect health-promoting behaviors either directly or indirectly through social pressures or encouragement to commit to a plan of action (Pender et al., 2011). Receptiveness to the influence of others may be developmental, particularly in adolescence (Pender, 2011).

The mother-daughter relationship may represent a unique example of how societal norms can be used to reduce health risks (Plunkett, Henry, Robinson, Behnke, & Falcon, 2007). In a qualitative study, Hispanic mothers described their parental role as advisors, models, protectors, and teachers of children (Durand, 2011). Although research has primarily focused on the supporting role of mothers in the mother-daughter relationship, empirical studies have also demonstrated a reciprocal relationship in which adolescent daughters can also be influential and supportive to their mothers in many ways (Mosavel, et al., 2007). Interaction patterns of parents influence health behaviors in children (Bruhn, J.G., Parcel, G.S., 1982).

Research is lacking related to how parental engagement effects PA when mothers and daughters engage in PA together (Dunton, Llao, Almanza, Jerrett et al., 2012). Pender et al. (2011) has noted how direct observation of others, and learning from experiences of others increases self-efficacy for successful behavior change. In this study, societal norms will be operationally defined as a score on Pender's Exercise Norms Scale (Pender et al., 2011).

Exercise self-efficacy.

Perceived self-efficacy (SE) is theoretically defined as the judgment of personal capability to organize and execute a particular health behavior; self-confidence in performing the health behavior successfully (Pender, et al., 2011). Concepts for SE were developed from Bandura's model of self-efficacy (Bandura, 1997). During adolescence, the teenager's level of SE can influence their future growth and development (Bandura, 1997). The HPM poses that perceived exercise self-efficacy (ESE) is influenced by activity related affect, however the relationship is actually reciprocal. As perceived SE

increases, positive affect increases. Self-efficacy also affects barriers to action. The higher the SE, the lower the perception of barriers to action (Bandura, 1997). As illustrated in Figure 1, SE directly affects health-promoting behaviors through efficacy expectations, and indirectly through perceived barriers and level of commitment, and persistence in achieving a plan of action (Pender et al., 2011). Exercise self-efficacy is operationally defined as a score on the Perceived Self-Efficacy Scale (Pender et al., 2011).

Activity related affect.

Activity related affect is theoretically defined as subjective feeling states or emotions occurring prior, during and following participation in a specific PA. Activity related affect is based on the stimulus properties with the specific behavioral event (Pender, et al., 2011). The result of the feeling state determines whether an individual will repeat the behavior again, or continue the behavior long term. The feelings that occur prior, during, and following an activity are based on the stimulus properties connected to the behavioral event. The feelings may be mild, moderate, or strong and are stored in memory that is subsequently associated with the behavior. For example, if the affect associated with the behavior is positive, the activity is likely to be repeated whereas if the affect associated with the behavior is negative, the behavior is less likely to be repeated (Pender et al., 2011). Some behaviors may be associated with both positive and negative feelings before, during, or after the activity, so it is important to ascertain the balance of the feelings to understand the context in which the behaviors occurred. As illustrated in Figure 1, activity related affect is believed to influence health behavior directly and indirectly through SE and commitment to a plan of action (Pender et al.,

2011). Pender does not make reference to activity related affect being related to societal norms. In this study, activity related affect is operationally defined as a score on The Physical Activity Enjoyment Scale (Pender, et al., 2011).

Commitment to a plan of action.

Commitment to a plan of action is theoretically defined as the intention to carry out a particular health behavior including the identification of specific strategies to do so successfully (Pender, 2012). A commitment to a plan of action includes cognitive and behavioral processes that promote an individual to engage in a health-promoting behavior (Shin, Pender & Yun, 2003). A commitment to a plan of action initiates a behavioral event. Commitment propels a person into action unless there is an unavoidable contending demand. Commitment to a plan of action involves two underlying cognitive process: (1) a commitment to carry out the action alone or with another, at a given time and place, regardless of competing preferences; and (2) structured explicit strategies for starting, carrying out, and reinforcing the behavior (Pender, et al., 2012). In order for the plan of action to be successful, it is important to identify strategies along the way to continue the behavior. An example might be to provide a tangible reward or reinforcement if the commitment is sustained. This process could be initiated through a mutual contract between the two parties, keeping in mind what strategies may energize and reinforce the behavior. (Pender, et al., 2012). The stronger the commitment to a plan of action, the greater chance the health promoting behavior will take place over time (Pender, Murdaugh, & Parsons, 2002).

Once the commitment is made to exercise, and the individual is able to sustain PA, a habit is formed and the new behavior may continue throughout the client's lifespan

(Pender, et al., 2012). An individual's belief about the benefits and barriers of action, SE and interpersonal and situational influences on a behavior and activity-related affect will determine the extent of the commitment to action (Shin, et al, 2003). These relationships are illustrated in Figure 1-2. In this study, commitment to a plan of action is operationally defined as a score on the Commitment to a Plan of Action Planning for Exercise Scale (Pender, et al., 2011).

Behavioral Outcome

Health promoting lifestyle behavior (physical activity).

Physical activity is theoretically defined as any bodily movement produced by skeletal muscles that results in expenditure of energy and includes occupational, leisure-time, and routine daily activities (Pender, et al., 2011). Exercise is a subcategory of PA performed during leisure time that is planned, structured, repetitive, and aimed at improving or maintaining physical fitness or health (Pender, et al., 2011). Pender uses the term *physical activity* to encompass a broad range of activities that if performed regularly will improve health (Pender, et al., 2011). PA norms are operationally defined as a score on the Physical Activity Recall (PAR) Scale and measurement of PA using the Actigraph® accelerometer.

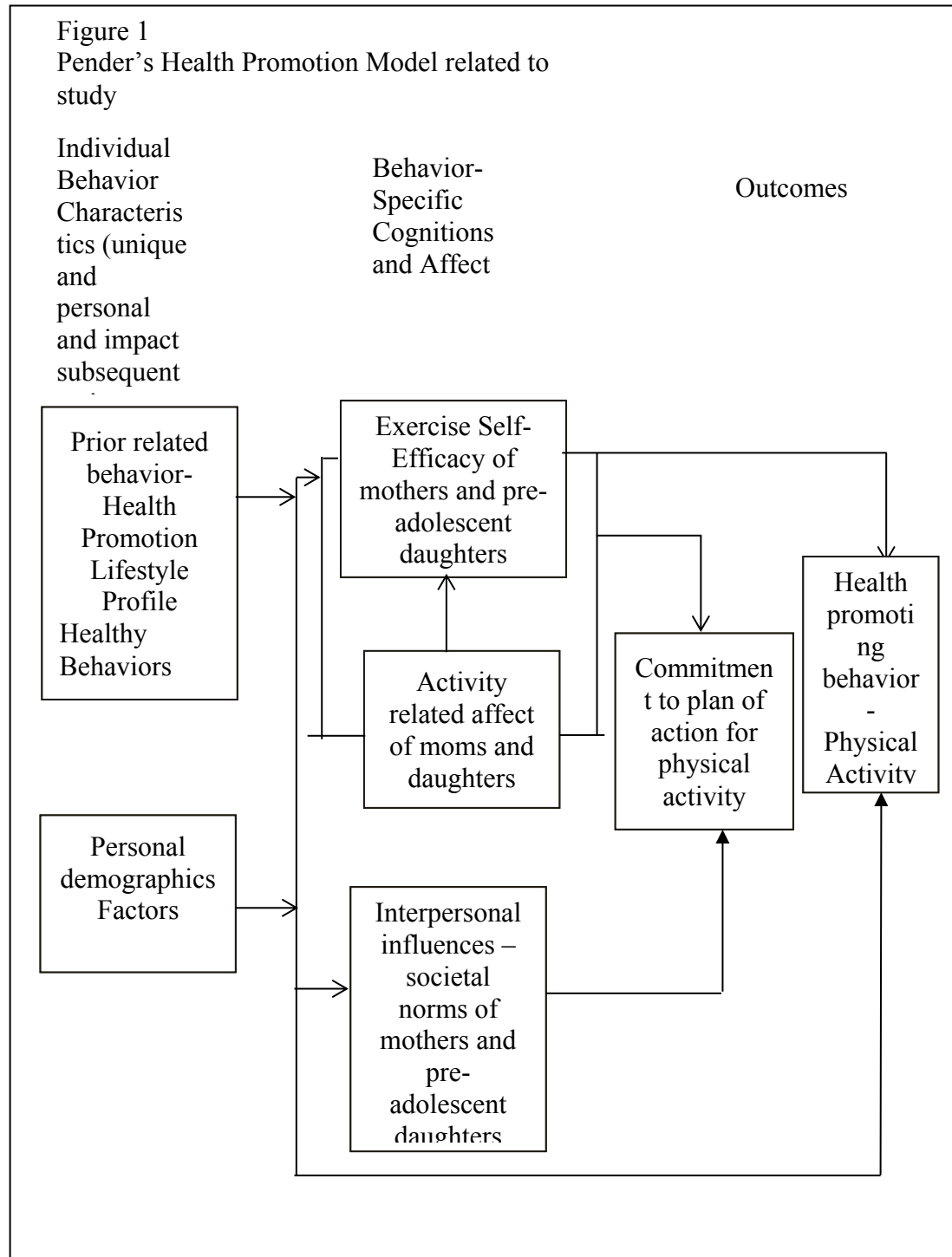


Figure 1. Behavior-specific cognitions and affect are important for motivation and provide focal points for intervention. Commitment to a plan of action to physical activity influences the outcome variable (physical activity). (Used with

Delimitations

Subjects will be self-reported Hispanic women and their pre-adolescent daughters aged 8-12 years. Since it has been demonstrated that PA among females declines as the pre-adolescent becomes more sedentary as they enter adolescence (Brodersen, Steptoe, Boniface, Wardle, 2007), pre -adolescent girls ages 8-12 years will be the target population for this study, accounting for the years leading up to the point at which PA declines. The mothers and their pre-adolescent daughters must live Western Michigan, and must speak English or Spanish. The instruments will be available in English and Spanish. Exclusion criteria are: health conditions such as extreme weakness, or any physical or emotional condition that will affect the participant's ability to answer survey questions for 45 - 60 minutes.

Significance of the Study

Physical inactivity is a leading cause of death in the US, yet the majority of individuals do not engage in regular PA. Notably, Hispanics have the highest inactivity rates (51.3%) among all ethnic and racial groups in the US (HealthyPeople.gov, 2012, <http://minorityhealth.hhs.gov>, 2011). This study will address a gap in the knowledge concerning factors that affect PA among Hispanic women and their pre-adolescent daughters. PA is a complex behavior involving multiple factors. Lack of PA contributes to leading causes of morbidity and mortality (MMWR, 2012). Since sedentary behavior among immigrants increases with the number of years living in the US, with acculturation, Hispanic immigrants will lose the comparative health advantages that have collectively been referred to as the “Hispanic Paradox” (Markides & Coreil, 1986; Taningco, 2007). PA patterns appear to begin during the pre-adolescent years and extend

into adulthood. It is important to study physical activity behaviors as children since children's attitudes and behaviors are more adaptable than adults and subsequently health-related behaviors in early life may have significant long-term results (Stucky-Ropp & DiLorenzo 1993). This study will identify factors that will encourage Hispanic girls to make PA a part of their health promotion activities as they enter into adulthood.

Previous research has identified exercise SE, activity related affect and commitment among women and children (Robbins, Pis, Pender & Kazanis, 2004) as strong predictors of participation in PA. However little research has been conducted among minority populations. Specific cultural factors including societal norms have been underexplored. This study will examine societal norms including an understanding of how Hispanic societal norms affect PA, and how societal norms are similar or different among the mothers and daughters. The study will increase the knowledge base of the HPM in relation to societal norms. Information generated from this study will address the gap in knowledge of the factors that foster sedentary behaviors among Hispanic mothers and their daughters who do not exercise. In addition, measurement of PA in most studies has been limited to self-reporting. This study will incorporate a valid physiological measure of PA through the use of an accelerometer.

Pender's HPM concepts of societal norms, self-efficacy, activity related affect, and commitment to physical activity used in this study, will expand nursing knowledge related to factors that can increase PA and support health promotion. Knowledge from this study can assist nurses in promoting PA among Hispanic women and girls, which will lead to healthier lifestyles.

The impact of Hispanic identity formation and cultural transformation on health risks, health behaviors (specifically PA), and coping strategies represents an emerging area of study that requires further conceptual and empirical development (Amaro et al., 2002). Nursing is poised as a key discipline in healthcare to promote a physically active lifestyle for Hispanic mothers and their daughters.

Pender's HPM (2011) has limited cross-cultural testing, and there has been no empirical examination of factors that influence PA among the Hispanic mothers and daughters, using the HPM. This study will contribute to increasing knowledge of factors associated with PA in the vulnerable Hispanic population, and specifically will generate knowledge related to improving the measurement of physical activity determinants in the Hispanic population, using the HPM. This study will strengthen the HPM to guide and advance clinical practice to evaluate the applicability of using factors in the HPM to promote the healthy behavior of PA among Hispanic mothers and their daughters. Results of this study will improve clinical practice by an increased understanding of culturally specific factors and provide data that can be used to test interventions to increase PA that will improve health outcomes among the Hispanic population. In summary, findings from this study can expand nursing knowledge to understand the complex issues of factors related to a commitment to exercise to promote healthy behaviors in a minority population that is at high risk for a host of illnesses associated with sedentary lifestyles.

CHAPTER II

Review of the Literature

The purpose of this research is to examine the relationship among societal norms, exercise SE and activity related affect on commitment to a plan of PA among the Hispanic women and their pre-adolescent daughters. This chapter consists of a discussion of the theoretical framework that guides this study, followed by a review of the empirical support for the relationships that will be tested in the proposed study. The formulated hypotheses will follow the theoretical discussion.

Theoretical Framework

The theoretical framework that will guide this study is Pender's Health Promotion Model (HPM) (Pender, Murdaugh, & Parsons, 2006). The HPM is a middle-range theory derived from Bandura's Social Cognitive Theory (Bandura, 2000; Pender, et. al, 2006). Pender's theoretical framework explores the multifaceted processes that motivate individuals to engage in positive health behavior changes. Both cognitive-perceptual factors and modifying factors are used to explain and predict health behaviors. The outcomes of this model are health-promoting behaviors that result in improved health and enhanced quality of life. The factors chosen for this study are societal norms, SE, activity related affect, and commitment to a plan of action. These factors were selected because of their importance to an understanding of motivation to engage in health promoting activities such as PA and have been historically understudied among Hispanic women and their daughters.

The HPM is an approach-oriented method that utilizes a person's competence as a motivating factor to achieve health. Of particular relevance for this study, the HPM is

applicable across the lifespan (Pender et al., 2006). The desired outcome of the HPM is health-promoting behavior, which is directed toward achieving positive health outcomes for the client. When health-promoting behaviors such as PA are incorporated into a healthy-lifestyle, the end result is improved health, enhanced functional ability and an improved quality of life for individuals at all stages of development (Pender et al., 2006).

To date, the HPM has limited degree of cross-cultural testing among subjects such as in the Taiwanese population (Wu and Pender, 2002). The predictive ability of the HPM in explaining health related behaviors across cultures could be enhanced through testing and revising the model. This type of research can contribute to a comprehensive theory with culture-specific constructs (Kerr, Lusk & Ronis, 2002). The HPM could guide interventions related to the Department of Health and Human Services action plan to reduce racial and ethnic health disparities among various demographic groups in the U.S. (USDHHS, 2011).

The purpose of Pender's HPM (2011) is to provide an understanding of the major determinants of health behaviors, in order to assist nurses in counseling individuals regarding health promotion lifestyles. This model was developed in 1982 and has been revised based on evolving theoretical perspectives and empirical findings. The theoretical roots of the HPM are grounded in expectancy value theory and social cognitive theory in order to identify background factors that influence healthy behaviors. Pender states that the HPM can aid nurses to work collaboratively with individuals to promote healthy behaviors and lifestyles. The outcome of this model is health-promoting behaviors that result in improved health and enhanced quality of life. As illustrated in Figure 1, Pender's model focuses on three areas: (1) individual characteristics and

experiences; (2) behavior-specific cognitions; and (3) affect and behavioral outcomes (Pender, et al., 2011)

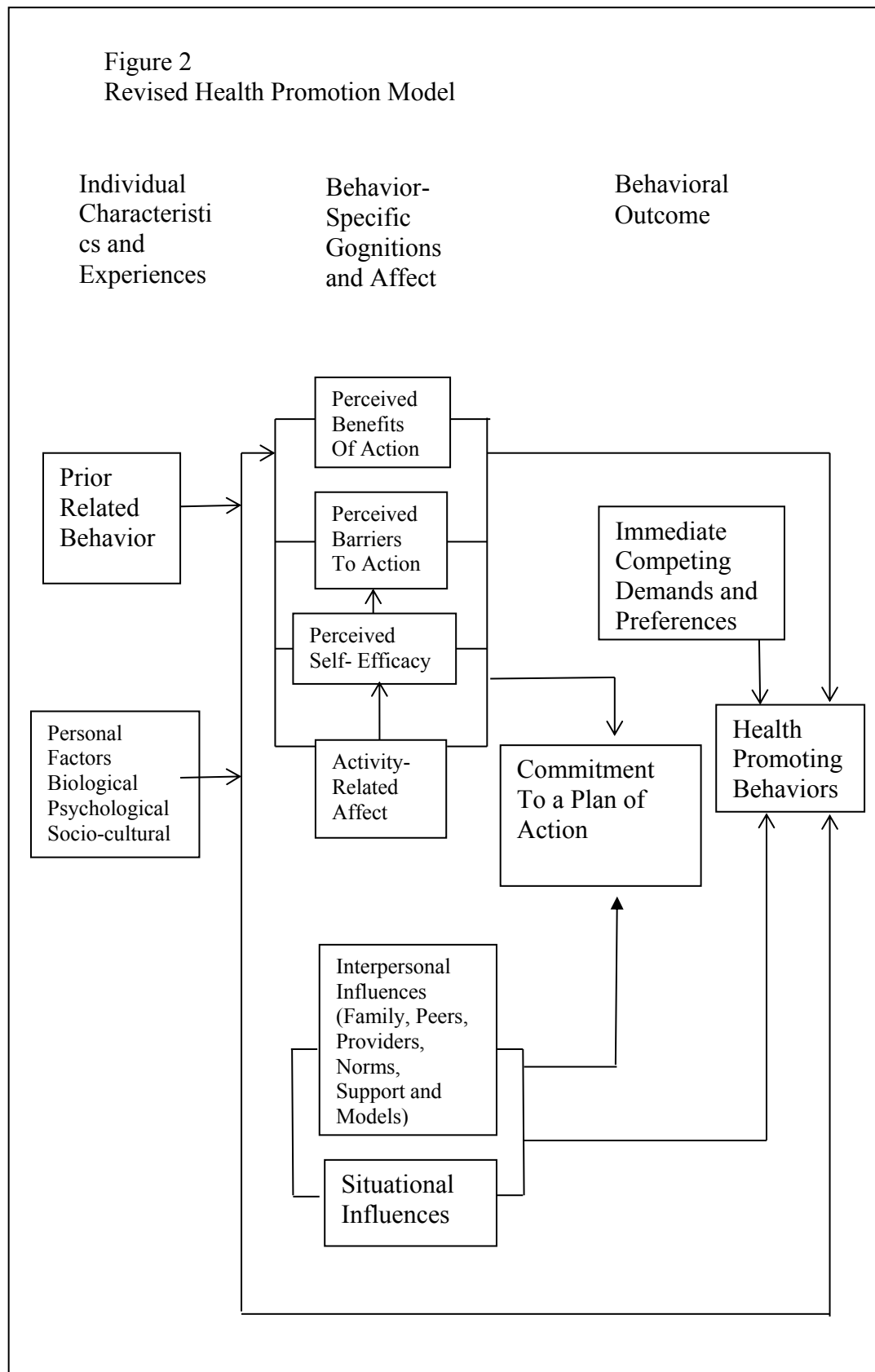


Figure 2. Revised Health Promotion Model (revised). Adapted from "Health Promotion in Nursing Practice (6th ed.)" by Pender, N. J., Murdaugh, C. L., & Parsons, M. A, 2011, p. 45 Boston, MA: Pearson. Copyright 2011 by Pender, used with permission.

Behavior Specific Cognitions and Affect**Interpersonal influences (societal norms).**

In the HPM, interpersonal interaction (also known as societal norms) influences health-promoting behavior directly and indirectly. Social pressures or support to a commitment to a plan of action for physical activity are relevant to this study. Wu and Pender (2005) define societal norms as expectations one hopes a significant other would have toward a health-promoting behavior.

For interpersonal influences to be effective, individuals must be cognizant of the desired behavior, and comprehend and assimilate input from others to the preferred behavior (Pender et al., 2006). Receptiveness to the influence of others may vary among generations, but is especially evident among adolescents. Societal norms include a wide variety of social interactions, experiences, rituals, and functions that include celebrations, relationships among different sexes, generational interactions, leisure, sporting and recreational roles, work related functions, family behaviors and the management of aging (Giesbrecht & Dick, 1993).

Interpersonal influences may have greater importance in some cultures, including the Hispanic population. Among Latinos, familial support may be more influential than external support, so it is important to include all members of the family when proposing lifestyle changes or health promotion. Extended family networks are crucial to the success of family centered approaches to care (Pender et al., 2011). Such “family” networks may also involve friends, neighbors, and members of faith-based organizations due to the social and communication networks provided by such organizations.

Therefore, in the Hispanic culture, the church may be an effective venue for health promotion programs (Pender et al., 2011).

Studies of the interpersonal influences present in the mother/daughter relationship have often focused on the mother's role in providing support to the daughter (Hutchinson, Jemmot, J., Jemmot L., Braverman, & Fong, 2003). However Mosavel, Simon and Van Stade (2006) discovered surprising results of how often mothers sought the adolescent daughter's advice for social affairs and relations, daily affairs and health information. Eighty-nine percent of the mothers interviewed reported their daughters provided them with health information. This study took place in a low-income ethnically diverse community outside Cape Town, South Africa. This study explained how in many underserved poor communities; young people often have more access to cultural knowledge and education than their parents. Similarly, in the U.S., children of immigrant parents often assist their parents in bridging cultural and communication barriers to health care providers (Kim, 1998).

Perceived exercise self-efficacy.

Bandura (2004) states that SE is the foundation of human motivation and action for change. Bandura reports that if a person does not believe that the power to control their actions will produce a positive outcome, they will not be able to persevere during the difficult times to achieve success. In adopting a new healthy lifestyle, an individual would need to believe they have the power to conquer the issue and succeed (Bandura 2004). Baranowski et al (2002) define SE as the individual's confidence in overcoming barriers to achieve a desired behavior. Self-confidence and overall success can be achieved through positive outcomes with small steps. As a person achieves small

repeated successes, the expectation of being successful will increase persistence and endurance in achieving the ultimate goal (Baranowski, 2002).

The distinct definition of exercise self-efficacy (ESE) is the confidence a person has about the ability to perform physical activity in light of given situations (D'Alonzo, Stevenson, & Davis, 2004). Research related to SE and PA has been focused mainly on structured aerobic types of exercise (Bandura, 2000).

In order to achieve a pattern of PA, small successful steps could lead to positive SE, which in turn will aid in achieving overall wellness. Efficacy beliefs have a direct effect on aspirations and goals. If SE is strong, goals are set higher, and commitment is stronger. If the SE is low, the goal setting is diminished, and people easily give up because they are convinced the outcome is futile. Those with high SE find ways to overcome obstacles, and have perseverance toward obtaining their goal (Bandura, 2004). In adopting healthy behaviors, such as PA, an individual has a better chance of achieving personal goals if they have a strong sense of self and strong SE; the stronger the perceived ESE the more active one becomes in their daily life (Bandura, 2000).

Pender (2011) reports that the construct of SE has been determined to be one of the most important predictors of human behavior. As an individual masters a desired behavior, such as PA, he or she experiences a positive feeling of competence in their ability to overcome obstacles in pursuit of the desired goal (Pender et al., 2006). Bandura (2000) postulates that if SE is strengthened, the ability to overcome undesirable personal behaviors is stronger, and ultimately skill level improves. An individual's perception of personal efficacy has a wide range of self-beliefs that affect the intensity of motivation, affect, thought and action (Pender et al., 2006). SE expectations are influenced by four

principal sources of information: mastery expectations (accomplishments), vicarious learning (modeling), verbal persuasion, and somatic responses to specific situations to build self-competencies and confidence (Pender et al., 2011).

The greater the perceived SE, the stronger and more persistent the individual will be in engaging in the behavior, regardless of how difficult or aversive obstacles might be (Bandura, 2000). Individuals with high SE expectations are more likely to set higher goals, expect their efforts will produce a favorable result and believe they can overcome obstacles to achieve their goals (Pender et al., 2011).

Activity-Related Affect

Activity-related affect (for exercise) is another HPM variable that is pertinent to this study. Activity-related affect refers to the subjective feelings individuals experience prior to, during, and after physical activity. These feelings stem from the stimulus properties connected to the behavioral event. These feelings can be mild, moderate, or strong and recur with subsequent acts of the behavior associated with the affective responses (Pender et al., 2011). There are three components that exist with activity-related affect: (1) emotional excitement to the specific act (act related); (2) the self-acting (self-related); and (3) the environment where the action takes place (context related), (Pender et al., 2006). The feelings related to the three components of activity-related affect vary in a range from negative to positive, and will have a direct response on the behavior. Behaviors that are associated with a positive activity-related affect are more likely to be repeated than those that invoke a negative response (Pender et al., 2006).

Commitment to a plan of action

The commitment to a plan of action is the initiation of the behavioral event, (Pender et al., 2006), and was added as a new construct added to the 1996 edition of the HPM (Srof, B., Velsor-Friedrich, B., 2006). Once the individual is committed to a specific behavior, it is posited the person will engage in the behavior unless a barrier or competing demand that cannot be avoided occurs (Pender et al., 2006). Pender postulates that a commitment to a plan of action implies the following essential cognitive processes: (a) a commitment to carry out the plan of action at a stated time and place with another person or alone, even in light of competing forces; and (b) identifying specific strategies to be used at different times in the behavior sequence so the plan of action will be successfully implemented (Pender et al., 2006). Pender (2006) reports when clients are in control of selecting the strategy that is desired to promote change clients become energized, thus reinforcing the preferred behavior. Without a plan, the commitment alone will not contribute to the desired health behavior (Pender et al., 2006).

Empirical Support**Interpersonal influences (societal norms).**

Pender's HPM was used as the conceptual framework in examining the predictors of health promotion lifestyle (HPL) in three ethnic groups: Ho-Lo, Hakka and aboriginal women (aged 65 to 91 years) of rural Taiwan (Wang, 1999). Findings showed that living arrangements were a significant predictor of a health promotion lifestyle that included various measures of physical activity ($p < 0.001$). The living arrangements of elderly Ho-Lo and aboriginal women provided individuals with environmental resources that may support a healthy lifestyle. It was concluded that living with others may meet supporting

and interaction needs among the group that enhance motivation to engage in HPL (Wang, 1999).

Social norms were measured in the Kerr, Lusk and Ronis (2002) study to test the applicability of the HMP model among 119 Mexican American workers and their use of hearing protection devices. A scale was adapted using Pender's (1993) instrument that was developed by the Child/Adolescent Health Behavior Research Center at the University of Michigan. Six items measured social norms (a sub-concept of interpersonal influences), which assessed workers beliefs about how strongly they felt that other persons in their work setting should wear hearing protection when exposed to a high noise environment. It was found that demographic characteristics, interpersonal influences, and situational factors were significant paths to one cognitive-perceptual factor: self-efficacy ($R^2 = .23, p < .01$).

Wu and Pender (2005) used a prospective study design to test a structural model of relationships between cognitions, interpersonal influences, and physical activity. The Norms Physical Activity Scale included 8 items that measured how much adolescents believed significant others thought they should exercise. The results indicated that norms and modeling were less consistent predictors than cognition variables and social support. The results indicated that females were less active than males in 8th and 9th grades (Wu and Pender, 2005). Limitations of this study were that the PA was self-report, and the subjects were from an urban setting, and limited to adolescents.

Smolowski and Bacallao (2006) studied cultural factors among the Hispanic parent-adolescent relationship with respect to cultural risk factors and assets. Familism was assessed using six items that had a rating of a 4-point Likert scale from strongly

agree to strongly disagree. This tool measured: (1) family members respect for one another; (2) values and beliefs as a family; (3) trust and confidence in family members; (4) loyalty to family; (5) feeling proud; and (6) being able to express feelings within family. Internal consistency reliability was .87. Familism was found to be an important predictor of lower adolescent aggression, with a statistically significant negative correlation between familism and parent child conflict ($r = -.50, p < .01$) (Smolowski et al., 2006). More information is needed to understand how familism affects cultural involvement in addressing health concerns, especially PA. In a review of existing literature of interventions to promote nutrition and exercise in Hispanics, familism was the cultural value most frequently measured in the interventions (Mier, Ory, & Medina, 2010). Mier et al. (2010) emphasizes the need to establish culturally sensitive models in behavioral research so that interventions can be tailored specifically to the needs of Hispanics.

Few studies exist how acculturation may influence physical activity among pre-adolescents (Liu, Probst, Harun, Bennet & Torres, 2009). In a study with data from the 2003 National Survey of Children's Health, acculturation and PA was examined with Hispanic girls aged 10 – 17 years ($n = 4,704$) (Liu, Probst, Harun, Bennet & Torres, 2009). Individuals who did not report participating in physical activity that was vigorous to cause sweating and hard breathing for 20 minutes at least three days per week were defined as not meeting PA requirements. Of the Hispanic females studied, 25.2% were first generation, 43.8% were second generation and 31.1% were third generation. English was the primary language for 42.8% of the participants. Females from immigrant families had greater odds for not obtaining PA requirements as compared to the third

generation individuals. In homes where English was not the primary language, there was also an association with not obtaining the recommended PA requirements (Liu, Probst, Harun, Bennet, & Torres, 2009). Generational status and English language should be examined as possible indicators to increase PA.

Few studies have also examined culturally competent interventions that address the correlates of physical activity for Hispanic women (Evenson, Sarmiento, Tawny, Macon and Ammerman, 2003). As part the Women's Cardiovascular Health Network Project, 671 first generation Hispanic immigrants, aged 20 to 50 participated in an in-person interview. The Latinas in this study reported that only 37% met vigorous or moderate recommendations for PA, with 42% insufficiently active and 21% inactive. Women reported they were more likely to exercise if they knew people who exercised (32.5%), or saw people exercise in their neighborhood (83.4%) (Evenson, et al., 2003). Limitations in this study include that the Latina population is culturally diverse, with many participants coming from different countries, physical activitie measures were self-reported and it was not reported the about the types of activities that were engaged by the women.

Wu and Pender (2002) used constructs from the HPM to examine the direct and indirect effects of Taiwanese family and peer influences related to PA. In this study, peers were found to have a stronger influence than parents with regard to active participation in PA among adolescents. One possible explanation for this finding may be that early adolescence is a time when youths affirm their independence from their parents and identify themselves with peers. It is also possible that adolescents prefer to participate in the same physical activities as their friends (Wu & Pender, 2002).

Children value family interactions and approval. However, adolescents often place specific importance on peer relationships (Garcia et al., 1995). It is vital to examine the effects of familial and social norms in relationship to PA among youth. As children enter into adolescence, peer friendships and relationships are valued (Wu and Pender, 2002). Behavioral choices that adolescents make are in part determined by social norms or how the behavior will be accepted among their peers (Evens, Gilpin, Faskas, Shenassa, and Pierce, 1995).

Societal norms, whether they be personal or cultural have a direct effect on PA. Pender has conducted limited research on societal norms, however, the results demonstrate the need to consider such concepts in understanding the specific ways that different cultures view health and the relationship that PA contributes to overall health and well being. There have been no studies on societal norms in Hispanic women and their adolescent daughters.

Exercise and perceived self-efficacy research.

Shin, Jang, and Pender (2001) used Pender's HPM to assess the psychometric properties of the Exercise Self-Efficacy (ESE) Scale among Korean adults with chronic diseases. Descriptive analysis established that Korean adults with chronic diseases demonstrated low ESE. ESE was significantly related to gender, education, regular exercise and frequency of exercise ($p < .005$) (Shin et al., 2001). The ESE scale demonstrated to be a useful measure of exercise beliefs of Korean adults with chronic disease. However, it is uncertain if the ESE scale would literally translate well with other populations. Further research is needed to validate the exercise self-efficacy scale among other cultures.

Pender, Bar-Or, Wilk, and Mitchell (2002) studied 103 girls, 8 to 17 years of age to assess (1) pre-ESE, (2) if pre-ESE perceptions influenced post-ESE and (3) if ESE increased after PA. Results indicated that girls with high pre-ESE reported lower perceived exertion during exercise than did the girls who reported low pre-ESE. ESE increased significantly from pre-to post-exercise. This occurred for the group with a lower efficacy score, ($p < .001$), as well as for the group initially higher in SE, ($p = .001$) (Pender, et al., 2002). In conclusion, findings from this study indicate that interventions directed at both increasing SE and promoting positive responses during SE can be effective methods of promoting PA among sedentary girls.

Wu and Pender, (2002) conducted a study among Taiwanese adolescents ($N = 832$) using the HPM to examine the relationships among interpersonal influence and behavioral cognitions (including SE), competing demands and PA. SE was measured with 14 items of the Perceived Self-Efficacy subscale that measured the strength of the participants' belief in their ability to engage in PA regardless of barriers. The subscale had adequate reliability with alpha coefficient greater than .80. The results from structural equation modeling indicated perceived self-efficacy was the most significant predictor of PA. From this study, it was determined that exercise self-efficacy is the strongest predictor of participation in PA among Taiwanese pre adolescents to adolescents, supporting the concept that girls with higher levels of ESE will more likely be physically active. A limitation in this study is that due to the cross-sectional study design, a causal relationship between variables was not inferred (Wu, et al., 2002). It is not known if the results would translate to other adolescent populations in other cultures.

Wu and Pender, (2005) addressed the limitations from the Wu, et al (2002) study and created a prospective study design, using the HPM. The purpose of this study was to “test a theoretically based model and explore the causal relationships between individual characteristics, interpersonal influences, and cognitions that predicted physical activity in Taiwanese adolescents” (Wu, et al., 2002). Perceived SE was measured with a 14-item Perceived Self-Efficacy Scale, created from two previous validated measures developed by: Garcia, Norton Broda, Coviak, Pender, and Ronis, (1995) and Sallis, Pinski, Grossman, Patterson, and Nader (1998). The scale consisted of items that measured how confident adolescents were in being physically active in spite of varying degrees of conflicting situations. The measurement of their confidence level ranged from 0% to 100%: 0% = not at all confident of being physically active, to 100% = completely confident of being physically active. This study used a 2-wave panel data to test the structural model. Predictive validity (to measure exercise behavior) was high with a Cronbach alpha coefficient of .90 for Wave 1 and .91 for Wave 2 (Wu, et al., 2002).

It was found that gender, social support, modeling, SE and perceived benefits and barriers had a direct and indirect influence on the behavior of PA. In this study, adolescents ($N = 832$; age of students ranged from 12 to 15 years, with a mean age of 13.5 ($SD = .58$). The sample consisted of more boys (54.8%) than girls (45.2%) (Wu, et al., 2002). Adolescents who had higher exercise SE scores actually performed less PA. This may have been attributed to the developmental stage of adolescence when youth may rebel against familial and societal expectations. In this study, SE and PA explained 25% of the variance in PA (Wu, et al., 2002). A limitation of this study is the use of self-report for PA. An accelerometer or pedometer would have added an objective

component. Also, the sample was taken from an urban setting in Taiwan, so results could not be generalized to other geographic locations. Evenson et. al (2003) also reported an unexpected finding in that higher self-efficacy was associated with lower levels of PA among Latina women. It was postulated that perhaps the Latina women in the study felt they could not do more exercise than what they currently were doing, or that inactive women were confident that they could not increase their PA.

Yang, Laffrey, Stuijbergen et al. (2007) investigated the level of leisure-time physical activity (LTPA) among midlife Korean American women and determined the relationships of LTPA with individual characteristics and behavior-specific cognition and affects. The study was a cross-sectional descriptive study of 152 middle-aged Korean American women from Central Texas. Pender's Health Promotion Model guided the study. LTPA SE was measured by the Exercise Self-Efficacy Scale developed by Bandura. The scale consists of 18 items that measure one's confidence in his or her ability to perform routine exercises in various conditions (Yang, et al. 2007). The answers range from 0 (*cannot do*) to 100 (*certain can do*) with higher scores on the scale representing greater perceived self-efficacy to engage in PA. The scale was translated into Korean, yielding a Cronbach's alpha of .94. The study utilized the translated Korean version of the tool, which exhibited a Cronbach's alpha of .96. Women with higher ESE reported greater levels of LTPA, supporting findings as in previous studies.

An evaluation of SE from Pender's HPM was conducted to predict PA in Iranian adolescent boys (Taymoori, Lubans and Berry, 2010). The study consisted of 515 boys, with mean age 14.33 years. ESE was assessed using a modified version of a scale developed by Garcia, George, Coviak, Antonakas and Pender (1995). This scale is an

eight-item scale in which individuals are asked to indicate how confident they are in their ability to be physically active in various situations. A 4-point Likert-type scale ranging from 1 (*not at all confident*) to 4 (*very confident*) to score the items. A 1-week test-retest reliability of the self-efficacy scale was ($r = .77$), and the alpha coefficient was ($\alpha = .90$) in the study of Iranian boys (Taymoori, et al., 2010). In this study, ESE demonstrated a direct effect on PA, ($p < .001$). The findings from this study support Pender's HPM, that exercise SE can have a direct effect on PA (Pender et al., 2006).

Robbins, Pender, Ronis, Kazanis and Pis (2004) explored the relationship of ESE to perceived exertion of PA among African American and European American boys and girls between the ages of 9 and 17 years of age. In both the girls and boys, there was a significant increase in post-activity SE with a lower perceived exertion during PA. Results indicated post-activity self-efficacy was positively correlated with peak VO_2 ($r = .32, p < .001$) and negatively correlated with reported perceived exertion ($r = -.38, p < .001$) (Robbins et al., 2004). The findings in this study indicated that health care professionals should counsel adolescents to engage in PA that is appropriate for their level of fitness and individual preferences, since higher PA exertion threatens ESE and jeopardizes motivation for regular PA (Robbins, et. al, 2004).

Duffy (1997) used the HPM to explain six dimensions of HPL with employed Mexican American women ($N = 397$). A canonical correlational analysis demonstrated two significant canonical pairs explained 88% of the variance in the subscale mean scores of the Health-Promoting Lifestyle Profile. The statistically significant variables included: demographic characteristics (age and education) and cognitive-perceptual factors ESE, internal and powerful others health locus of control and perceived health status) (Duffy,

1997). ESE was measured using The Self-Efficacy Scale developed by Sherer (1982). This study indicates that using the HPM, ESE may play a role in promoting health lifestyle behaviors, including PA, among Mexican American women.

In summary, six studies using Pender's HPM were examined with relationship to ESE related to PA. In all six studies, ESE had a direct effect on PA. All of the ESE instruments had an acceptable alpha coefficient ($\alpha = .90$). It has been recommended that the influence of various determinants of PA, such as SE be studied in different populations (Sallis and Owen, 1999). The participants in the above studies were varied including Taiwanese, and Iranian adolescent boys and girls, and Korean middle-aged women. The measurement tools were individualized according to specific cultural activities with the Korean population but not in the Hispanic population. It is noted however, that two studies did not support a higher self-efficacy yielded in higher PA rates.

Activity related affect.

Robbins, Pis, Pender, Kazanis, (2004), examined the relationship between feeling states, SE and enjoyment during physical activity, among adolescents. An 11-item Feeling Scale by Gauvin & Rejeski (1993) was administered every 4 minutes during a 20 minute standardized treadmill activity. Validity was indicated with this instrument using a 5 point scale ranging from -5 (*very bad*) to 5 (*very good*); with a correlation of .87 between the scale and both positive and negative feeling states. Enjoyment of PA was overall positively correlated with enjoyment of the treadmill activity ($r = .48, p < .001$). There was a positive correlation with feeling states and postactivity SE ($r = .38, p < .001$). This study by Robbins, Pis et al., (2004) support the relationship in the HPM

between activity related affect and ESE. The findings from this study also suggest that ESE and affect are reciprocally influential bidirectionally (Sroff and Velsor-Friedrich, 2006).

Taymoori et al., (2010) measured enjoyment of PA using six items from the modified 16-item version of the Physical Activity Enjoyment Scale (Motl et al., 2001). Enjoyment of PA items were rated on a 4-point scale ranging from 1 (*not at all true*) to 4 (*very true*) with an alpha coefficient of $\alpha = .85$. The findings, that enjoyment of PA was positively related to participation in PA, support Pender's HPM that behavior specific cognitions can have a direct effect on PA, ($p < .01$).

In a qualitative study, males were more likely than females to report an enjoyment of being physically active, stating they enjoyed winning and achieving a personal best (Burton, N., Turrell, G., and Oldenburg, B., 2003). Results from this study also revealed that socioeconomically disadvantage participants: (a) were less likely to engage in PA; (b) were more likely to have poor health experiences; (c) had limited exposure to PA; (d) had fewer activity-promoting cognitions; (e) expressed fewer anticipated benefits; (f) had less social support, and (g) experienced greater barriers of access and personal functioning (Burton, et al., 2003). A disadvantage of this study is the small sample size that included 30 males and 30 females. Heitzler et al. (2010) measured enjoyment related to PA among a sample of youth aged 10-17 years ($N = 720$) using the 16 item Physical Activity Enjoyment Scale developed by Motl and colleagues (Motl, et al., 2001). Contrary with much of the literature, perceived enjoyment was not found to have a positive association with youth PA. The sample reported a high self-efficacy (mean = 30.6 on a scale ranging between 11 and 40) and a high degree of enjoyment (mean = 29.7

on a scale of 7 – 35). It is thought that high levels of self-efficacy and enjoyment related to PA does not facilitate PA, but low levels of PA may not support regular PA. It was also believed that although students could exercise if they wanted to, but may not have the motivation to carry it out due to low levels of enjoyment (Heitzler, et al., 2010).

In conclusion, activity related effect has an effect on PA. Studies support Pender's HPM that behavior specific cognitions can have a direct effect on PA.

Commitment to a plan of action for exercise.

Commitment to a plan of action was also evaluated as a predictor of PA in the study of Iranian adolescent boys (Taymoori et al., 2010). Evidence of commitment to a plan of action for PA is manifested by different strategies individuals use to increase or commit to a PA plan such as goal setting and monitoring (Pender et al., 2006). The 11-item scale was scored from 1 (*never*) to 3 (*often*). In this study, the alpha coefficient was ($\alpha = .86$), and the reliability of the 2 week test-retest was ($r = .90$) (Taymoori et al., 2010). In accordance with Pender's HPM, commitment to planning was associated with PA ($\beta = .14, p < .05$).

Shin, Yun, Pender, and Jang, (2005) tested constructs in Pender's HPM to develop a causal model of a commitment to a plan for exercise among 403 Korean adults over 18 years of age, with chronic illnesses. Commitment to a plan of action for PA increases readiness for action by identifying specific strategies that an individual will use to initiate a plan of action (Shin, et al., 2005). The path model accounted for 54% of the variance for the construct of a commitment to a plan of exercise among Korean adults with a chronic disease (Shin, et al., 2005). The results supported both direct and indirect effects of SE, exercise social support, and exercise on a commitment to a plan for

exercise. The strongest explanatory variables were past experiences of exercise and the perceived benefits of exercise (Shin, et al., 2005). It was determined in this population there is a need for reliable and valid instruments to predict specific individuals commitment to a plan of exercise to determine the relationship between the actual commitment and exercise behavior. It is important to note that the subjects suffered from a chronic illness so the motivation to exercise may be different for healthy versus chronically ill individuals.

Nies, Vollman, and Cook (1998) studied European American women to determine the facilitators, barriers and strategies that contribute to exercise performance. In this qualitative study, commitment was identified as a facilitator to exercise. Commitment was defined as the determination to engage in PA (Nies et al., 1998). For those who rated commitment as a facilitator to exercise, the need to make time for things that were important was listed as a reason for the commitment. Among those who did not make the commitment for physical activity, lack of dedicated time to exercise was cited as the chief reason. Women, who associated exercise with weight loss or stress reduction, expressed a greater commitment and motivation to carry out PA (Nies et al., 1998).

Commitment to a plan of action was supported as a predictor of PA, as evidenced by the studies previously discussed. A commitment to a plan of action has a positive effect on initiation of a plan to engage in PA.

Conclusion

The Hispanic population continues to be the fastest growing minority group in the United States and is expected to comprise at least 18% of the population by year 2025 (<http://www.census.gov/population/www/projections/natproj.html>, retrieved July 1,

2012). Studies have identified that 74% of Hispanic women report no leisure-time physical activity (Crespo, Smit, Andersen, Carter-Porkras, & Ainsworth, 2002) and Hispanic girls are less likely to be physically active than other racial and ethnic groups (MMWR, 2012; Singh, Yu, S, Siahpush, & Kogan, 2008). There is ample evidence that Hispanic women are concerned with PA and view PA as an important issue in maintaining overall health and well being, yet the majority of research related to promotion of PA has focused on majority, middle-income women and men (Keller, Fleury, Castro, Ainsworth and Perez, 2009).

To promote PA among Hispanic girls and women to levels that are consistent with national health objectives, research is needed to understand the unique cultural perspectives of Hispanic women and their daughters regarding PA. Most PA research has been conducted on Caucasians and adults, and with Asians subjects using the HPM (Wu and Pender, 2002). Little is known about the determinants of physical activity among younger populations, particularly those from diverse ethnic and cultural groups (Wu and Pender, 2002). Research is needed to better understand the mother-daughter relationship, with respect to PA. Little is known about the specific ways mothers can influence their daughters to become more physically active.

Pender's HPM has cross-cultural testing with the Asian population. The predictive value of explaining health behavior across cultures can be improved through testing and making revisions to the model (Kerr et al., 2002). Berg, Cromwell, and Arnett (2002) state that for interventions to be successful in increasing PA to a habitual occurrence, the values and beliefs of the participants must be considered. Culturally based worldviews are essential to the success of PA interventions, and should be at the

core of such planning. Rather than believing that such cultural beliefs need to be corrected or changed, researchers should value divergent cultural perspectives as strengths upon which to build successful health promoting interventions.

This study will add to the HPM knowledge about societal norms, ESE, and activity related affect on commitment to exercise among mothers and adolescent daughters in the Hispanic population. The results of this study will increase an understanding of the factors which can promote health through physical activity among Hispanics.

Hypotheses

Theoretical rationale

The HPM identifies background factors that influence an individual's health behavior. A central focus of the HPM includes the concept of health that is achieved through inherent and acquired human potential, which is an evolving life experience (Pender, 2011). The HPM contends that optimal health is achieved through goal-directed behavior, competent self-care, and fulfilling relationship with others. When an individual experiences perceived SE to carry out a desired behavior, such as PA, the likelihood of commitment to action and actual performance of the desired behavior increases. When positive emotions or affect are linked with a specific behavior such as PA, the chances of commitment and action is increased (Pender, 2011). Based on these theoretical propositions, the following hypotheses are derived and will be tested:

1. There will be a significant relationship between societal norms and commitment to a plan of physical activity among Hispanic women and their daughters.

2. There will be a significant relationship between exercise self-efficacy and commitment to a plan of physical activity among Hispanic women and their daughters.
3. There will be a significant relationship between activity related affect and commitment to a plan of physical activity among Hispanic women and their daughters.
4. There will be a significant relationship between commitment to a plan of physical activity and participation in physical activity among Hispanic women and their daughters.
5. There will be significant differences in societal norms, exercise self-efficacy, activity related affect and commitment to exercise between Hispanic women and their daughters.
6. Societal norms, self-efficacy, activity related affect and commitment to a plan of physical activity of mothers will be significant predictors of physical activity levels of daughters.

Chapter 3

Methodology

This chapter will explicate the research design for the proposed study, describing the research setting, sampling methods, sample, the instruments, the procedure for data collection, and method of data analysis. The design used for this study is a descriptive, correlational research design.

Research Setting

Following approval by the Rutgers Institutional Review Board (IRB), the study took place in three Catholic churches in communities in Western Michigan, an area with a substantial population of immigrant Hispanic families. Although sixty percent of Hispanics identify themselves as Catholic, (www.pewhispanic.org), this figure falls to 49% among second and third generation young Hispanics. Since the Catholic faith is the religion preference among Hispanics, Catholic churches were chosen for the research setting. All three churches are located in low-income Hispanic neighborhoods. Two of the churches are located in the same city, which has a significantly higher percentage of Hispanics (19.45% versus 4.4%) and a higher poverty rate (16.3% versus 14.8%) than does the state of Michigan as a whole (U.S. Census, 2012). These two churches each report a total 700 Hispanic people who attend each mass on Saturday and Sunday. The third church is in a location with a Hispanic or Latino rate of 22.7% compared to 4.4% in Michigan, and a poverty rate of 15.4% compared to 14.8% in Michigan (U.S. Census, 2012). Although demographic data concerning the ethnic makeup of the parishes are difficult to obtain (interview with Father Steven Cron, September 18, 2012), it is estimated that 700-800 Hispanics attend Mass each weekend at each parish, ensuring an

adequate sample of Hispanic women and their daughters. The rate of Hispanic parishioners that attend the Spanish Masses is 99%. The Hispanic mothers and pre-adolescent daughters were invited to sign up for the study, after Mass on specific Sundays. Data collection took place in designated areas in the churches and in a school that was related to one of the churches.

Design

Sampling Methods.

An announcement concerning the research study was given to the parish office to be placed in the church bulletin (Appendix A) for one week prior to the actual research date and for three days at the one school that was related to one of the churches. This announcement included the following information: (1) an explanation of the study and eligibility criteria, (2) the location of the study, (3) the date and time of the study. The priest announced the study at the end of Mass, inviting mothers and their daughters between the ages of 8-12 years to come to learn more about the study. The sampling method was a convenience sample. The inclusion criteria consisted of: (1) Self-identified Hispanic mothers and their daughters, ages 8-12 years; (2) the mothers and daughters must live in western Michigan; (3) the mothers and daughters must speak and write either English or Spanish. The exclusion criterion is that the mothers and daughters must be healthy enough health to participate in a 60-90 minute survey.

A snack of clementines, muffins and water was offered to the participants of the study, and to other family members. Childcare was offered for mothers with small children. A solar dancing flower was given to the daughters and siblings of the daughters. Once the study was explained to the mother and daughters in both English and Spanish,

consent forms were signed. Copies of the consent and assent forms in English and Spanish are found in Appendix B. Participants were informed that they may withdraw from the study at any time. They were also informed about their rights to confidentiality and anonymity will be protected. In order to avoid a response bias, the women and their daughters completed the surveys in separate parts of the room. Bilingual research assistants were available to subjects who needed assistance with completing the forms. Following the consent process, the participants' height, and weight were measured, and recorded for Body Mass Index (BMI) to be calculated. The Principal Investigator (PI) gave an accelerometer to each of the participants, along with instructions that they must wear the accelerometer on the right hip, attached to a belt. The instructions were available in Spanish or English, and provided instruction on the use of the actigraph and the importance of caring for the actigraph. The mothers and daughters were asked to wear the accelerometer all the time except while bathing, swimming or sleeping and after three days the participants will return the accelerometer to the church in order to receive the \$20.00 Meijer gift card for each mother and daughter. The software for the Actigraph® was the Lite version and therefore when the participant returned the monitor, it could not be determined if there was sufficient activity data on the accelerometer.

When the monitors were turned in, each strap was removed from the actigraph and washed with laundry soap in a lingerie bag in an electric washing machine, then set in the dryer on low to dry. The actigraph was downloaded to the computer and a flashdrive for data from the actigraph. The actigraphs were initialized and numbered each time for the participants starting at 001M the mothers, and 001D for the daughters.

To protect confidentiality and anonymity, participants' names were not used on any forms, but the form for the actigraph. Participants were informed that their name, address, and phone number was collected and written on the actigraph sheet only for purposes of keeping track of the monitors. Surveys were in a locked cabinet after information is taken. Data was stored on a computer to which only the researcher has access.

Sample size.

The sample size was determined by using the power analysis program, R software package (<http://cran.us.r-project.org>). To achieve a power = 0.85, 78 mothers + 78 daughters will be recruited for this study. The correlation level was currently 0.3.

Instruments

Various instruments were used to collect data on the dependent variables of interest in this study. All of the instruments were available in English and Spanish. The instruments that have not been previously validated in Spanish were translated from English to Spanish then back-translated (Brislin, 1970). Back-translation is the process in which an instrument is translated from its original source language into a target language, and then translated back to the source language (Polit & Beck, 2012). The first translations from English to Spanish was conducted by a bi-lingual college graduate native to Mexico. The Spanish to English back-translation was carried out by a second individual who is bilingual and not familiar with the instruments. The Spanish tools were piloted with Hispanic mothers and their daughters after mass at one of the churches. Minor adjustments such as a letter in a word were made. The Flesh reading ease (<http://office.microsoft.com>) were for the following instruments: Exercise self-

confidence, 75.5%, grade level 4.9; Physical Activity Related Affect, 81.8%, grade level 4.8; Exercise Norms Scale, 99%, grade level 7. The instruments proposed for use in the study are:

Demographic questionnaire.

An eight-item investigator-developed questionnaire was used to collect demographic data. The following demographic data and participant characteristics were collected to describe the study sample: age, marital status, the number of years of school completed, income based on family quartiles, and number of people in the household. A copy of the demographic questionnaire is found in Appendix C.

The short acculturation Scale for Hispanics.

The Short Acculturation Scale for Hispanics (SASH) (Marin & Sabogal, 1987) was used to collect acculturation data, to understand the unique aspect of the Hispanic population (Evenson, et. al, 2003). The SASH is a 12-item questionnaire, measured on a 5 point Likert scale, will be available in Spanish and English, in a paper and pencil format. Eight questions are related to language: languages spoken, languages in reading, thinking listening to on television and radio with response choices from 1 = “Only Spanish” to 5 = “Only English”. Other questions are related to close friends, attending social gatherings, people one chooses to visit, and preference of child’s friend, with response: 1 = “All Latinos/Hispanics” to 5 “All Americans”. Questions related to immigrant generation are assessed. First-generation immigrants are individuals who were board abroad and moved to the U.S. Second-generation immigrants are born in the U.S. and have at least one foreign-born parent, and third-generation immigrants are born in the U.S. with both parents born in the U.S. (Driscoll, Russell & Crockett, 2008).

In the development of the scale, separate factor analyses of the responses of 363 Hispanics and 228 non-Hispanic whites produced three factors: 'Language Use', 'Media' and 'Ethnic Social Relations' (Marin & Sabogal, 1987, p. 183). The 12-item scale explained 67% of the variance for Hispanics, and was highly correlated with the following validation criteria: respondents' generation, length of residence in the U.S., age at arrival to the U.S., self-identification of ethnicity, and with an acculturation index. The first factor with five items explained 54.5% of the variance while having strong correlation with the various criteria. The validity and reliability with the SASH were comparable to other published scales. Validation results were similar to Mexican Americans and Central Americans (Marin & Sabogal, 1987).

Ellison, Jandorf, and Duhamel (2011) presented an analysis to determine the usefulness and validity of SASH in determining the acculturation among Hispanics who participated in a colorectal cancer screening study. Ellison et al. (2011) analyzed relationships between the scale and many common acculturation proxy variables, to determine the extent of the correlation. Proxy variables included: "proportion of life in the USA, years of education in the USA, age at immigration, the number of years lived in the USA, and language preference" (Ellison, et al., 2011, p. 480). Relationships between the scale and several common acculturation proxy variables were analyzed. Among the sample used, a high correlation was found with the variables most used as proxies for acculturation. Cronbach's alpha reliability scores and the SASH inter-scale correlations were uniform throughout the scale. The validity of the SASH scale was strengthened by the extent of the correlation that was determined between the acculturation scale and individual proxy variables (Ellison, et al., 2011). The limitations in this study was that

the sample was adults who were 50 years or older, mostly women, and most had health insurance. The responses from the individuals were self-report and were linguistically and culturally matched with interviewers. A copy of the SASH is found in Appendix D.

Anthropometric measures.

Height, body weight, BMI. Height was measured using standards from the National Health and Nutrition Examination Survey Anthropometry Procedures Manual, (CDC, 2007). Height measurements were taken in stocking feet, in meters, on a Shorr Board® Stadiometer. The Frankfort Horizontal Plane, which is an imaginary line passing through the external ear canal and across the top of the lower bone of the eye socket, immediately under the eye was used in this measurement (CDC, 2007). Weight was measured to the nearest 0.1 kilogram (kg) for each participant in clothing, without shoes, using a Tanita® Inner Scan Body Composition BC534, on a hard surface. The scale capacity is 150 kg (330#), weight increments is 0.1 kg (.21 pounds) and was powered with four AA batteries.

BMI were calculated: $\text{weight (kg)} / \text{height (meters}^2\text{)}$. Data for these variables

Table 2

Body Mass Index for Adults

Measure

Below 18.5	Underweight
18.5 – 24.9	Normal
25.0 – 29.9	Overweight
>30	Obese

were collected and entered on paper forms. The guidelines used to classify the mothers and daughters as overweight or obese, based upon the CDC BMI chart are shown in Table 1 and Table 2 respectively. A copy of the anthropometric measures form is found in Appendix E.

Table 3

Body Mass Index for Children

Measure

BMI \leq 5 th percentile	Underweight
BMI \leq 85 th percentile	Healthy
BMI 85 th percentile \leq BMI 95 th percentile	Overweight
BMI \geq 95 th percentile	Obese

Measures of physical activity

Physical activity was measured by an accelerometer, Physical Activity Recall (PAR) and Lifestyle Profile II.

Accelerometer.

Minutes of moderate vigorous physical activity (MVPA) was assessed by the ActiGraph GT3X-plus, a small lightweight accelerometer (Troost, McIver, Pate, 2005), that is reliable and valid for assessing MVPA (Kelly, Reilly, Grant, 2004; Troost, Ward, Moorehead, Watson, Burke, 1998). This activity monitor provides physical activity measurements: (1) activity counts; (2) energy expenditure; (3) steps taken; and (4) activity intensity levels. The ActiGraph GT3X-plus® records time varying accelerations

with a range in magnitude from +/- 6 g's. The data was stored in a non-volatile flash memory for further analysis (www.theactigraph.com). The Actigraph® was used to measure activity intensity levels of the mothers and daughters.

This Actigraph® records acceleration counts from which minutes of MVPA was estimated by analysis software (Trost, Ward, Watson, Riner, Burke, 1998). The actigraph is a waist-mounted activity monitor. Accelerometers measure body movement and estimate the frequency, duration and intensity of free-living physical activity (Thomas, et al., 2011). This type of activity monitor is real-time data collection and has no reporting errors or errors introduced by interviewers (Thomas, et al., 2011). Refer to Appendix F for Declaration of Conformity for GT3X+.

Physical Activity Recall.

The Physical Activity Recall (P-AR) Scale was developed specifically as part of a non-exercise method to assess aerobic capacity (VO₂ max) (Jackson et al. 1990). The amount of days for the P-AR was designed to measure estimated energy expenditure. Jackson et al., (1990) estimated Vo₂ max based on age, percentage of body fat, gender, and a self- report of activity level using the NASA-JSC PAR Scale. In comparison to direct measurement of VO₂max (treadmill testing), the authors report a validity coefficient of ($r = .79$) and SEE, 5.7 ml/kg/min. There is no validity and reliability data on the PA-R itself. Jackson et al. (1995 and 1996) demonstrated correlations of between VO₂max (as demonstrated by a maximal treadmill exercise test) and the PA-R of ($r = .58, p < .05$) among adult men (Jackson et al., 1995) and ($r = .63, p < .05$) among adult women (Jackson et al., 1996).

A secondary analyses was performed on previously collected data in three cohorts of adults from the National Aeronautics and Space Administration/Johnson Space Center (NASA), the Aerobics Center Longitudinal Study (ACLS), and the Allied Dunbar National Fitness Survey (ADNFS) that included non-exercise model variables to measure cardiorespiratory fitness (CRF) without performing exercise testing (Jurca et al., 2005). All three databases included self-reported physical activity levels (SR-PA) from the original eight-category scale used by Jackson et al. (1996). The study indicated that CRF might be accurately assessed using self-reported activity. Participants included men and women aged 20 to 70 years whose CRF level was quantified with a maximal or submaximal exercise test as part of NASA, ACLS, or ADNFS. Results indicated that CRF may be assessed from a non-exercise test model across a diverse population. The mean CRF of the NASA and ADNFS men were most likely higher than the ACLS men, and the mean CRF of the NASA women was lower than in ACLS and ADNFS women with a relatively small difference. The SR-PA profiles of the ACLS and ADNFS women were similar, however the NASA women reported high and very high ratings. The multiple correlation coefficients obtained within NASA, ACLS, and ADNFS participants were 0.81, 0.77, and 0.76 respectively. All regression models demonstrated a high level of cross-validity (0.72, R, 0.80). The P-AR will be available in English and Spanish and will be used in pencil and paper format. A copy of the PAR is found in Appendix G.

Lifestyle Profile II.

The Lifestyle Profile II (HPLP II) adult version (Walker et al., 1995), and The Adolescent Lifestyle Profile (Hendricks, C., Murdaguh, C., & Pender, N., (2006). This test will be completed by the mother and daughter, to assess their current way of life and

physical activity habits. The 52-item HPLPII is composed of a total scale and six subscales to measure dimensions of a health-promoting lifestyle including spiritual growth, interpersonal relations, nutrition, physical activity, health responsibility, and stress management. Two of the six subscales will be tested: interpersonal relations and physical activity, which will result in 8 questions. Interpersonal relations compromised of sense of intimate relationships and communication through sharing of thoughts and feelings. Physical activity includes regular participation in light, moderate, and/or vigorous activity that may be planned for health and fitness, or may be part of daily life or leisure activities (Walker & Hill-Polerecky, 1996). Content validity was established through literature review and content experts' evaluation. Construct validity was established through factor analysis that confirmed a six-dimensional structure of health-promoting lifestyle by convergence with the Personal Lifestyle Questionnaire; ($r = .68$), and by a non-significant correlation with social desirability. Alpha coefficient of internal consistency for the entire scale was .94; and alpha coefficients for the subscales ranged from .79 to .87. In a 3-week test-retest stability coefficient was .89 for the total scale (Walker & Hill-Polerecky, 1996). Scoring Instructions include Never (N) = 1, Sometimes (S) = 2, Often (O) = 3, Routinely (R) = 4. This scale will be a pencil and paper format.

The HPLPII has been psychometrically validated throughout many groups, however the Spanish version has only been recently validated (Perez-Fortis, Diez and Padilla, 2012). A principal component analysis revealed that a six-component model for 44 items accounted for 40% of the variance, with an internal consistency of .87 for the scale. Confirmatory factor analysis resulted in a better fit of the six-component structure from the principal component analysis, indicating that the health-promoting lifestyle may

be sensitive to context and culture (Perez-Fortis, et al., 2012). A copy of the 8-item Lifestyle Profile II questionnaire in English and Spanish that will be used in this study is found in Appendix H.

The Adolescent Lifestyle Questionnaire was used for the daughters.

Exercise Norms Scale.

The Exercise Norms scale is an instrument designed to measure social norms for PA. Pender created this tool for adolescents, and others have adapted the tool to measure exercise norms in adults. The instrument assess the respondents' beliefs about how much others (such as family member, closest friend, other friends, teacher, doctor), think they should exercise. The Exercise Norms Scale is in response to the question asking how much (does the participant) think particular people expect them to exercise, or be active to the point of sweating, breathing fast or making the heart beat fast. This scale contains 8 items. This item is a 3-point Likert scale ranging from not at all to a lot. Test-retest reliability coefficient is .76 (Pender, 2011). Cronbach's alpha was not calculated due to structure of the scale (Pender, 2011). The method of administration will be a paper and pencil format. In summary, this scale has been used among the adolescent population with limited use among the adult population.

Wu & Pender (2002) used the HPM to examine the relationships among interpersonal influences, including norms. The eight-item Children's Exercise Social Norms Scale (Garcia, Norton Broda, Frenn, Coviak, Pender, & Ronis, 1995) was used. The responses ranged from 1 (*never*) to 4 (*often*). The subscales were scored by calculating the means of all the items. Wu & Pender (2002) state that due to the nature of the norm subscale, psychometrics of assessing internal consistency using Cronbach's

alpha was not assessed. Test-retest reliability coefficients for the norms subscale = .76.

A copy of the Exercise Norms Scale questionnaire in English and Spanish that will be used in this study is found in Appendix I.

Exercise Self-Efficacy.

Self-efficacy for exercise (Bandura, 1986) is a self-assessment of personal capacity to exercise at a specific level on a regular basis. Self-efficacy is noted to be a predictor of exercise among the majority of adolescents (Reynolds, Killen, Bryson et. al., 1900; Zakarian, Hovell, Hofstetter, Sallis, Keating, 1994; Pender, Bar-Or, Wilk, & Mitchell, 2002; Robbins, Pis, Pender & Kazanis, 2004) and adults (Sallis, Pinski, Grossman, Patterson & Nadar, 1988; Garcia, King, 1991; Poag, McAuley, 1992).

Sallis et al., (1988) developed a self-efficacy scale for health-related diet and exercise behaviors among participants 45 years of age or younger with children aged 8-16 years living in the household, who were interested in changing their diet or exercise patterns. Sallis et al. (1988) cited self-efficacy (Bandura, 1977) as a mediator of behavior change, stating that self-efficacy expectations are believed to influence the types of activities individuals participate in, the amount of effort used to engage in the activity and the amount of tenacity to continue the activity in the face of obstacles. The Self-Efficacy for Exercise Behavior Scale consists of 49 items with ratings on a 5-point Likert-type scale from (1) 'sure I could not do it to' (5) with a response option for 'does not apply'. Factor structure of each scale was determined using varimax rotation. The solution contained 11 factors accounting for 69% of the variance, with many of the factors containing only two or three items, and only two factors had eigenvalues > 2.0: resisting relapse and making time for exercise. Factor test-retest reliabilities were both 0.68.

Cronbach's alpha demonstrated internal consistency of 0.83 and 0.85 for each factor. Criterion-related validity was assessed by correlating self-efficacy factors with exercise habits. Self-efficacy factors were significantly reported with reported participation in vigorous activity. There were significant correlations between self-efficacy and health behaviors as evidenced by concurrent criterion-related validity (Sallis, et al., 1988). The Self-efficacy for Exercise Behavior Scale is also known as Exercise Confidence Survey (Sallis et al., 1988)

Pender developed the Children's Self-Efficacy scale (Garcia, et al., 1995) based on scales used previously for adolescents (Desmond, Price, Lock, et al., 1990) and adults (Sallis, Pinski, Grossman, Patterson & Nader, 1988). The scale consisted of eight items with a five-point Likert scale. Cronbach's alpha was .77. The eight items included sentences about exercise, with the definition of exercise including activity that caused fast breathing, getting sweaty or having the heart beat fast.

Wu and Pender (2002) examined several of the constructs from the HPM including self-efficacy related to physical activity. The study was conducted among Taiwanese adolescents, $N = 832$. A 14-item subscale measured the participants' belief in their ability to participate in physical activity despite conflicting situations. Items ranged "0% = I am not sure I can do it, 50% = I am somewhat sure that I can do it, to complete assurance, 100% = I am very sure I can do it", (Wu & Pender, 2002, p. 30). The internal consistency coefficient was .89, and in the pilot study, the criterion-related validity for this subscale had a significant correlation with the global self-efficacy item ($r = .57, p < .01$). Model testing was conducted for this study. Perceived self-efficacy was tested in the first path Model A that indicated a good fit. Model A accounted for 26% of the

variance for this group of Taiwanese adolescents. The results indicated that perceived self-efficacy directly influenced PA. About 19% of the variance in PA was explained by self-efficacy, the strongest predictor among the PA related cognitions that were tested (Wu and Pender, 2002).

Robbins, Gretebeck, Kazanis, and Pender (2006) used the self-efficacy construct from Pender's HPM to assess adolescent girls' confidence in their ability to overcome barriers to PA. Subjects included 77 racially diverse sedentary adolescent girls in grades 6, 7, and 8. The girls were randomly assigned to a control group or an intervention group. A 19-item Perceived PA Self-Efficacy Questionnaire was used. A five-item Likert-type scale ranging from "1 = not at all true to 5 = very true" was used to indicate the level of activity the adolescent would pursue activity in the face of barriers (Robbins, et al., 2006). Cronbach's alpha for the Self-Efficacy Questionnaire was .91.

Wu, Robbins, and Hsieh (2011), measured self-efficacy items used by Pender et al. (2006) and PA-related self-efficacy measures from a comprehensive review of existing instruments or tools. The participants included a convenience sample of 105 boys and 101 girls from grades sixth through eighth; 47.1% were European American, 19.4% were African American, and 18% were other races (Wu et al., 2011). This instrument consisted of the eight items from Pender et al. (2006) with three additional items. The total self-efficacy scale had a Cronbach alpha coefficient of .86.

In a study with Korean adults with chronic disease, the HPM was used to test seven constructs, including exercise self-efficacy (Shin et al., 2005). The Exercise Self-Efficacy Scale was translated into the Korean language. The scale had a total of 18 items using a "100% scale ranging from 0% *cannot do*; intermediate degrees of assurance at

50%, *moderately certain can do*, to complete assurance at 100% *certain can do*” (Shin et al., 2005, p. 120). Participants rated their confidence level on the 0%-100% scale, to indicate related to how confident they were to be physically active in spite of adverse conditions or barriers. The scale had a .94 Cronbach’s coefficient alpha.

The Children’s Self- Efficacy Scale will be available in English and Spanish and administered to adolescents, and The Self-efficacy for Exercise Behavior Scale also known as Exercise Confidence Survey will be available in English or Spanish and administered to mothers in pencil paper format (Appendix J).

The Physical Activity Enjoyment Scale.

The Physical Activity Enjoyment Scale (PACES) will be used to measure the variable of activity related affect in the Hispanic mothers and their daughters. The 18-item PACES was developed to measure enjoyment as a determinant of physical activity among college-aged students (Kendzierski & DeCarlo, 1991). The respondent was asked to rate how he or she felt immediately after a session of physical activity. This instrument assessed various aspects of PA related affect (Duda, 1998). Kendzierski and DeCarlo (1991) conducted two studies to examine the validity and reliability of PACES. In the first study, 37 undergraduate students rode an exercise bike under controlled conditions. There was a negative correlation between PACES and a score on proneness to boredom. In the second study each of the 37 undergraduates rode an exercise bicycle and jogged on a mini-trampoline in separate sessions, then chose which activity they wanted to do in the third session. There was a significant relationship between PACES and the activity they chose. Test-retest reliability was high for jogging, and moderate for bicycling. PACES demonstrated a high internal consistency in both studies (Kendzierski

& DeCarlo, 1991). The adult generated PACES (Kendzierski & DeCarlo, 1991) was found to be less appropriate for children and adolescents than it was for adults (Crocker, Bouffard, & Gessaroli, 1995).

The PACES tool was used to construct measurement for the youth (Motl, et al., 2001). Enjoyment has been noted to be a determinant of PA among youth, however an understanding of the relationships have been hindered by the use of measures that were not adequately validated (Motl, et al., 2001). Factorial validity of the PACES and construct validity of PACES scores were conducted with 1,797 adolescent girls. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were used to estimate the factor structure. The final factor structure was tested with cross-validation sample resulting in hypothesized relationships among scores from four measures: (1) enjoyment; (2) factors influencing enjoyment of physical education; (3) physical activity; and (4) sport involvement. These measures were tested using structural equation model with the complete sample. The result of the CFA indicated the measurement model was a good fit ($\chi^2 = 1769.57$, $df = 451$, $RMSEA = 0.040$ [90% CI = 0.038-0.042], $RNI = 0.93$, $NNFI = 0.92$). The factor loadings, uniqueness, standard errors, t-values, and SMCs were labeled as appropriate sign and/or magnitude. Interfactor correlations ranged between 0.19 and 0.45 ($M = 0.30$, $Md = 0.28$) which are noted as significant (Motl, et al., 2001). The invariance of the structural model was tested across African-American and Caucasian girls and resulted in a good fit. Factorial validity and convergent evidences for construct validity demonstrate that the PACES is a valid measure of physical activity enjoyment among adolescent girls that is appropriate for use as a mediator variable in interventions designed to increase physical activity (Motl, et al., 2001). PACES has not

been used in the Hispanic population. Copies of the Physical Activity Enjoyment Scale will be available in English and Spanish and in pencil and paper format (Appendix H).

Planning Commitment for Exercise for Adolescents and Adults.

The Planning for Exercise for Adolescents and Adults scale (Pender, et al., 2011) will be used. The planning commitment for exercise scale was developed to measure various strategies individuals use to increase PA, such as setting goals and activity monitoring (Pender et al., 2007). Individuals are asked to indicate how often they use different strategies to increase their physical activity commitment, on an 11-item scale. This scale was scored from 1 (never) to 3 (often). The 2-week test-retest reliability of the scale was $r = .90$, and Cronbach's alpha was $\alpha = .82$ (Pender, et al., 2007).

This scale has not been tested with the Hispanic population, therefore face and content validity of the Hispanic version of this scale will be assessed prior to administration. The Planning Commitment for Exercise Scale has however been psychometrically evaluated among Korean adults and Iranian adolescent boys. In the population of the Korean adults, the scale was revised using a qualitative and quantitative approach (Shin, et al., 2003). The revised schedule consisted of 20 items. Results of the revised scale demonstrated sufficient reliability and validity to use among the Korean population. Cronbach's coefficient alpha was .93. Content validity of the scale was conducted by experts who were in agreement that all 20 items were appropriate to assess a commitment to a plan of action for exercise among Korean adults with chronic diseases. Iterated principal factor analysis and varimax rotation was conducted resulting in item distribution among four factors. The first factor with seven items was named Exercise- Conditions ($\alpha = .80, p < .001$), because items were related to the scope of the

exercise experience. The second factor with six items was named Exercise – Cue Expansion ($\alpha = .81, p < .001$), since items were related to things that prompted one to exercise. The third factor with four items was named Exercise- Interpersonal ($\alpha = .81, p < .001$), since the items represented interpersonal connections for exercising. The fourth factor with four items was named Exercise-Recording/Rewards ($\alpha = .87, p < .001$), because the items were related to reinforcement measures or planning types of rewards.

The evaluation of a revised HPM to predict physical activity in Iranian Boys explained 34% of the variance in PA and represented a good data fit ($\chi^2 = 9.12, df = 4, p = .058$) (Taymoori, et al., 2010). In this revised model, self-efficacy ($\beta = .28, p < .001$), enjoyment ($\beta = .26, p < .001$), and commitment to planning ($\beta = .13, p < .05$) were all directly associated with PA (Taymoori, et al., 2010). In this model, commitment to planning, test-retest reliability coefficient, $r = .90$, and Cronbach's alpha, $\alpha = .89$ (Taymoori, et al., 2010).

Planning for commitment to exercise is an important correlate of PA participation. Studies testing commitment to exercise among pre-adolescents rarely have been conducted among Hispanic populations including Hispanic women and their daughters. The Planning for Exercise for Adolescents and Adults Scale (Pender, et al., 2011) will be provided in Spanish and English in pencil and paper format, and will be administered to adolescents and adults. Refer to Appendix K for the Planning for Commitment to Exercise Scale.

Data Analysis Plan

A statistical database using the Statistical Package for the Social Sciences (SPSS) version 19.0 for Windows (IBM SPSS Statistics, 2010) was used to analyze the data.

Testing differences between two group means with the *t*-test compared the two independent groups (Polit, 2012). Descriptive statistics analyzed the demographic data including an analysis of means and standard deviations for the mothers and daughters. Analysis of data among the mothers and daughters from the three churches determined significant differences among the three groups. Frequency tables, histograms, and scatterplots were used to assess the distribution of study variables for normality. Tests for skewness and kurtosis was performed to analyze data for inconsistencies, outliers, and wild data entry codes (Munro, 2005).

Data were collected by surveys from mother/daughter pairs at the beginning of the study. Information from the study yielded quantitative (continuous, categorical or binary) measures of societal norms, exercise self-efficacy, activity related effect and commitment to physical activity for each individual in the study. The participant's physical activity was measured by an accelerometer for three days, and results were analyzed for the level of activity of the mothers and daughters. The goal of this study is to identify associations between some of the measures taken at the beginning of the study (measures of acculturation, societal norms, exercise self-efficacy, activity related effect and commitment to physical activity and examine how the mothers' physical activity level may influence the daughters' physical activity level. Other related associations was measured such as acculturation, level of education, socioeconomic status, height, body weight, BMI level, PAR, and HPLP.

The statistical methodology used for data analysis was the random effects model, or variance component models. Random effects ANOVA is the appropriate model when the levels of independent variables are selected at random from a larger set, when there is

a large number of possible orders (Cohen, 2008). This enabled use of regression analysis or ANOVAs, while accounting for and measuring similarities between mothers and daughters. Hypothesis one through six will be tested with this model. A correlational analysis of the study variables will be conducted using both Pearson product moment correlation coefficient (r) to quantify relationships between two variables. A correlational analysis was conducted to determine if there are any demographic variables that are significantly correlated with the dependent variable. In addition, correlational analysis was conducted to determine if the independent variables are related to the dependent, or outcome variable of commitment on physical activity. Regression analysis will be conducted to determine which behaviors independently predict physical activity outcomes (Munro, 2005). Hypothesis six and seven will be tested with this model.

Chapter 4

Analysis of the Data

The purpose of this study was to determine factors, which affect commitment to a plan of physical activity among low-income Hispanic mothers and their daughters. Data were collected from a sample of 79 Hispanic mothers and their daughters from Hispanic Catholic churches and a Hispanic Catholic school. The following instruments were used in this study: a) a demographic questionnaire, developed by the investigator, was used to collect information on age, marital status, number of children, length of stay in the United States, highest level of education, employment, annual income, level of education, hours of sleep per night for the mothers, and age, birthdate, grade in school, length of stay in the United States, hours of sleep per night for the daughters; b) The Short Acculturation Scale for Hispanics (SASH) was used to collect acculturation data (Marin & Sabogal, 1997) c) Anthropometric measures including height, body weight, body mass index calculated from height and body weight; d) Actigraph GT3X-plus physical activity intensity and duration of physical activity; d) Physical Activity Record (PA-R) measured self-report of physical activity (Jackson et al., 1990); e) Lifestyle Profile II (LP) (adult version) (Walker et al., 1995) and Adolescent Lifestyle Questionnaire (ALQ) were used to measure a self report of physical activity habits; f) Exercise Norms Scale (NORMS) were used to measure exercise norms in adults and children (Pender, 2011); g) Exercise Self-Efficacy (ESE) was used to measure personal capacity to exercise at a specific level on a regular basis for mothers and daughters (Garcia, et al., 1995; Sallis et al., 1988); h) The Physical Activity Enjoyment Scale (PACES) was used to measure activity related affect in the mothers and daughters (Kendzierski & DeCarlo, 1991; Motl, et al., 2001); i)

Planning Commitment for Exercise (COMM) for mothers and daughters was used to measure various strategies individuals use to increase PA (Pender, et al., 2011). The analysis of the data is presented in this chapter.

Statistical Description of the Variables

Data were collected in pencil and paper format and manually entered into the Statistical Package for the Social Sciences (PASW) for Windows, version 20. Descriptive statistics were calculated for each item. The raw data and clean data were maintained in a codebook, and copies of all output and syntax data was stored electronically in computer files. The quality of the data was examined for normality, extreme skewness and kurtosis using frequency tables, histograms and scatterplots as reported in Table 5 (Munro, 2005). The degree of skewness (z-score) was evaluated for normal distribution. Normal distribution occurs if the z-score is in the range of -1.96 to 1.96 (Monro, 2005). All Z scores were within an acceptable range.

Demographic Variables

Scores for the Demographic questionnaire are in noted Appendix 1. Kendall's τ_b Correlational analysis was conducted to examine for significant relationships between demographic variables and commitment for physical activity, to determine if any demographic variable was a covariate that should be controlled for in multivariate analysis. Mothers and daughters were analyzed separately. The data did not suggest any strong associations between commitment to physical activity and the various demographic variables. The range of p values were between age and commitment ($p = .135$), years in the U.S ($p = .426$), income and commitment ($p = .655$), and hours of sleep and commitment ($p = .720$).

Exercise Norms Scale

The mothers' mean score for the Exercise Norms Scale was 1.8 ($SD = .61$), and the daughters' mean score for the Exercise Norms Scale was 2.1 ($SD = .50$). A paired t -test was computed to determine the mean difference in exercise norms between Hispanic women and their daughters. The results of the t -tests revealed significant differences between the mean scores, ($t = -3.78$, $p < .001$, 95% CI $[-.48, -.15]$), indicating the daughters had a higher mean score on exercise norms. In this 4-point Likert scale, the higher the number, the stronger the belief about how much others feel they should exercise. In this 5 item 3-point Likert Scale, the mean score of 2 reflects (sort of) that among Hispanic mothers and daughters, there is some belief that others think they should exercise. Wu and Pender (2002), examined societal norms among Taiwanese adolescents, and reported social norms had a weak and non-significant direct effect on physical activity, but had significant indirect effects on physical activity through perceived benefits and perceived self-efficacy.

Exercise Self-Efficacy

The mean score on the Self-Efficacy Scale for the mothers was $M = 2.39$ ($SD = .62$). (Refer to Table 6). In this 11 item, 5- point Likert scale, higher scores reflect stronger beliefs that an individual can engage in physical activity in face of obstacles. The mean score of 2.39 reflects that among Hispanic mothers, they are "fairly sure they could not do it". The daughters' mean score for the Self-Efficacy Scale, in an 8 item, 5- point Likert scale was slightly higher than the mothers; $M=3.26$ ($SD = .91$). This score reflected an "in-between" belief that the daughters could engage in physical activity in the face of obstacles. A paired t - test was computed to determine the mean difference

between Hispanic women and their daughters exercise self-efficacy, and revealed significant differences in mean scores ($t = 6.63$, $p < .001$, 95% CI $[-1.13, -.60]$), indicating there are significant differences between mothers and daughters, with the daughters having higher exercise self-efficacy than mothers.

Physical Activity Enjoyment Scale

Scores for the Physical Activity Enjoyment Scale were calculated for the sum and mean score. As described in Table 4, the mean score for the Mothers' PACES was 3.21 ($SD = 3.2$), and similarly for the daughters, the mean score was 3.17 (.544). The higher the score (18 item, 5- point Likert scale) on the Physical Activity Enjoyment Scale, the stronger the enjoyment of physical activity was. The mean score for the mothers (3.21) and the mean score for the daughters (3.17), reflects that when the mothers and daughters did exercise, they enjoyed the experience of being physically active. The results of paired t-test for mothers and daughters was ($t = 1.6$, $p = .10$, 95% CI $[-.02, .28]$), which indicates there were no significant differences in the mean scores between mothers and daughters.

Planning for Commitment for Exercise

With this scale, the higher the number (11 item, 3-point Likert scale), the stronger the commitment is for exercise. The mothers' commitment score, ($M = 1.7$ ($SD = .49$), reflects that among Hispanic mothers they sometimes make a commitment for physical activity. The daughters commitment score was similar, ($M = 1.8$, ($SD = .48$), indicating that the daughters also stated they sometimes make a commitment for physical activity. The paired t-test between the mothers and daughters did not reflect differences in commitment means ($t = -.67$, $p > .098$, CI $[-.27, .024]$).

Table 4

Descriptive Statistics of the Study Variables

Variable	Mothers (n=79)	Daughters (n = 79)
	M (SD)	M (SD)
Social Norms	1.8 (.78)	2.1 (.71)
Exercise self-efficacy	2.3 (.62)	3.2 (.91)
Physical activity enjoyment (PACES)	3.2 (3.2)	3.1 (.54)
Commitment to a plan of physical activity	1.7 (.49)	1.8 (.48)
Physical activity recall	1.73 (1.8)	2.39 (1.16)
Adult Lifestyle Profile	1.68 (.47)	N/A
Adolescent Lifestyle	N/A	3.09 (.96)
Acculturation (SASH)	1.96 (.739)	N/A

Table 5

Description of paired t-tests for mother (M) – daughter(D) pairs

	M (SD)	t	p	95% CI
CommitMeansM	1.7 (.50)	-1.67	.09	[-.27, .024]
CommitMeansD	1.8 (.48)			
NormsM	1.8 (.61)	-3.78	.00*	[-.48, -1.5]
NormsD	2.1 (.50)			
Exercise Self-EfficacyM	2.3 (.62)	6.63	.00*	[-1.13, - .60]
Exercise Self-EfficacyD	3.2 (.91)			
PACESM	3.2 (.61)	1.6	.10	[-.02, .28]
PACESD	.13 (.70)			
Moderate Physical ActivityM	82.16 (52)	-1.08	.285	[-1095, 329]
Moderate Physical ActivityD	465 (2500)			
Lifestyle Profile Mothers	1.68 (.47)	-11.64	.00	[-1.64, -1.16]
Lifestyle Profile Daughters	3.09 (.96)			
Physical Activity Recall Mothers	1.73 (1.8)	-2.57	.012	[-1.16, -.14]
Physical Activity Recall Daughters	2.39 (1.61)			

SASH

Since the majority of the women were first generation immigrants and their daughters were born in this country, the SASH tool was only administered to the mothers. The mean score was 1.96 (SD = .739). In this 12 item, 5-point Likert scale, the mean score of 1.96 reflects that the Hispanic women generally had low levels of acculturation. Acculturation is associated with an individual's length of residence in the U.S., age at arrival to the U.S., self-identification of ethnicity and language used (Ellison et al., 2011; Marin & Sabogal, 1987). Although most responses reflected a low level of acculturation;

79.7% of mothers reported they would like their daughters to have friends who were Spanish or English, equally explaining their desires to have their daughters be acculturated to the U.S. cultures, yet maintaining their heritage too. Kendall's tau_b analysis revealed a positive relationship between mothers' acculturation and education, ($\tau_b = .435, p = .001$); education and income, ($\tau_b = .267, p = .003$); and years living in the United States and income, ($\tau_b = .191, p = .024$). These results support findings from previous studies which indicate that acculturation is positively correlated with education and income (Crespo, et al., 2000; Eyler et al., 2002; Portes and Rumbaut, 2007). Portes and Rumbaut (2007) report that for new immigrants to the US, ethnicity does not appear to be a source of progress as it did when Europeans immigrated to the U.S. after World War II, but instead it is a mark of "permanent subordination". There was not a significant relationship between SASH and percentage of total activity, ($\tau_b = -.118, p = .176$). Among mothers from this sample, there was a low level of acculturation and physical activity which reflects previous findings that there is an associations with immigrant females where English is not the primary language and not meeting the recommended PA requirements (Bacallao and Smokowski, 2009; Liu et. al, 2009). Bacallao and Smolowski (2009) report that Mexican immigrants who have mastered both English and Spanish language appear to be healthier.

Anthropometric Measures

Scores for anthropometric measures: height, weight, and body mass were calculated according to the CDC adult and child/teen BMI charts, and described in Table 6. In the sample of Hispanic mothers, 12% of the women were normal weight, 33% were overweight and 33% obese. Among the daughters, 39% were of normal weight, 20%

were overweight and 23% of the daughters were obese. The findings in this study (66%) reflect CDC (2012) findings that Hispanic women have higher obesity rates compared to the general population (78% overweight, obese), and the daughters (46% overweight, obese) is higher than the CDC (2012) report of Hispanic children ages 6-11 are 22.4% (overweight, obese).

Table 6

Description of mother and daughter weight and BMI according to the CDC BMI measurements.

	Mother (n=79)	Mother (n=79)
	n, Percentage	n, Percentage
Weight <18.5 Underweight Child/teen < 5 th percentile	1 (1.13)	0 (0)
18.5-24.9 Normal weight: Adults Healthy: child/teen- 5-85 th percentile	12 (15.2)	36 (45.6)
25.0 – 29.9 Overweight Child/teen: 85 to less than 95 percentile	33 (41)	20 (25.3)
>30.0 Obese Child/teen: >95 th percentile	33 (41)	23 (29.1)

Actigraph® data

Scores for the Actigraph® data were calculated in terms of the number of daily sedentary minutes and total sedentary minutes. Physical activity was classified as either light, life, moderate, vigorous and very vigorous. The mothers and daughters wore the

Actigraphs® for an average of 50 hours of total time. Participants were asked to wear the monitor for three days during waking hours. They were asked to secure the monitor in place first thing in the morning and remove it just before bedtime. The device is not water-proof, so subjects were instructed to avoid using the monitor in the shower or allowing it to become wet. Actigraph® data revealed the mothers were engaged in sedentary activities for 71.12% of the time monitors were in place. Similarly, the daughters engaged in sedentary activities for 71.18% of the time the monitors were in place. Of the total time the Actigraph® was worn mothers engaged in light activity 17% of the time and daughters were engaged in light activity 15% of the time. Neither group reported much in the way of vigorous PA (.3% for mothers and .5% for daughters) and even less time was spent in very vigorous PA, (.04% for mothers and .09% for daughters). This outcome is well below the recommended physical activity guidelines. Cut points are the specific measures that quantify activity levels using Actigraph® products. The cut point measures used for this study were: sedentary 0-99, light 100-759, lifestyle 760- 1951, moderate 1952- 5724, Vigorous 5725 – 9498 and Very Vigorous 9499 - ∞ (Freedson, Pober, & Janz, 2005). Example of measuring physical activity intensity are: 1) sedentary activity – examples include standing, watching the television time spent at the computer standing, watching the television or at the computer, 2) light activity,- includes shopping and cooking, 3) lifestyle activity – examples include walking yard work, housework recreational activities such as golf, bowling and bicycling 4) moderate activity, walking fast, water aerobics, riding a bike on level ground, playing double tennis, 5) vigorous, jogging or running, swimming laps, riding a bike fast, playing

basketball, 6) very vigorous are activities that faster and more intense than vigorous activities (CDC, 2013).

Self-Report Physical Activity

Scores for self-reported measures of physical activity for Physical Active Recall Scale (PAR) (for both mothers and daughters), Lifestyle (physical activity) Health Promotion Scale (LPM) (mothers), and the Adolescent Lifestyle Questionnaire (ALQ) (for daughters) for physical activity were calculated. The lifestyle profiles for mothers (LPM) and daughters (ALQ) were measured by self-report, on a 4- point Likert scale. Higher scores reflect self-reports of increased physical activity. The higher the score on the 7- point PAR scale, the higher the level of PA. The daughters had a slightly higher mean score for the PAR, $M = 2.39$ ($SD = 1.75$), compared to their mothers, who had a mean score = 1.734 ($SD = 1.8$). The mean score for the mothers' Lifestyle Profile, $M = 1.73$ ($SD = 1.8$) and the daughters' $M = 2.39$ ($SD = 1.75$), Adolescent Lifestyle Questionnaire, reflects their self-report of physical activity each week. The mean score for the mothers' Physical Activity Record, $M = 1.73$, ($SD = 1.83$) and the mean score for the daughters' Physical Activity Record, $M = 2.39$, ($SD = 1.61$) also reports weekly PA. As noted in Table 7, there is a significant difference between the mothers' and daughters' mean scores on self-report of PA. The results of paired t-test for the lifestyle physical activity profile was ($t = -11.64$, $p = .00$, 95% CI [- 1.64, -1.16]) and the results of the paired t-test for the PAR was ($t = -2.57$, $p = .01$, 95% CI [- 1.16, -.15]). In both paired sample correlations of self-report of physical activity, the daughters had higher mean scores than the mothers, which indicates that the daughters' self-report they were more physically active than their mothers'.

Psychometrics of Instruments in Study

As reported in Table 7, the psychometric properties of the instruments used in this study were analyzed for their reliability. Among the mothers, all Cronbach coefficients were within the acceptable range. However among the daughters, the PACES Scale instrument (Cronbach alpha = .56) and the Adolescent Lifestyle Questionnaire (ALQ) (Cronbach alpha = .68) were somewhat lower than expected. This indicates that both tools may need to be refined for improved reliability.

Table 7

Alpha Coefficients for Instruments in Study

Instrument	Cronbach alpha; means for Moms	Cronbach alpha; daughters	Means
SASH	$\alpha = .94, M = 1.97$	N/A	
Social Norms	$\alpha = .79, M = 1.85$	$\alpha = .71, M = 2.16$	
ESE	$\alpha = .94, M = 2.4$	$\alpha = .81, M = 3.3$	
PACES	$\alpha = .79, M = 3.3$	$\alpha = .56, M = 3.15$	
Commitment Scale	$\alpha = .92, M = 1.7$	$\alpha = .85, M = 1.8$	
HPLP	$\alpha = .83, M = 1.69$	N/A	
ALQ	N/A	$\alpha = .68, M = 3.09$	

Hypotheses Testing

Hypotheses 1 through 4 were tested using correlational analysis between the mothers and daughter dyads and between groups of mothers and daughters. Kendall's τ_b was used to measure the relationship between two ranked ordinal variables (Munro, 2005). Values close to 1 indicate a strong agreement, values close to -1 indicate a strong disagreement. Hypothesis 5 was tested using paired t – tests for mother daughter pairs. The hypothesized relationships were tested using two tailed tests of significance set at the .05 level (Tabachnick & Fidell, 2007). Hypothesis 6 was tested using multiple regression.

Hypothesis I

Hypothesis I, there will be a significant relationship between societal norms and commitment to a plan of physical activity among Hispanic women and their daughters, was derived from Pender's proposition that societal norms influences health promoting behaviors directly and indirectly (Pender et al., 2011). The Kendall τ_b was used to determine whether there was a significant association between the mean score on the Social Norms Scale and the mean score on the Commitment to a Plan of Physical Activity Scale. The Kendall τ_b statistic was computed comparing the scores for the mothers and daughters separately. Correlational analysis did not reveal a significant relationship between social norms and commitment of mothers, ($\tau_b = .087, p = .29$). However, there was a significant relationship between social norms and commitment of daughters, ($\tau_b = .27, p = .001$). Therefore, this hypothesis was partially supported. These results indicate that as the mean of social norms increase, so does the means of commitment for PA. Therefore, as expectations of others increase for the mothers and daughters to exercise; the level of commitment to physical activity will increase.

Hypothesis 2

Hypothesis 2, was there will be a significant relationship between exercise self-efficacy and commitment to a plan of physical activity among Hispanic mothers and daughters. This hypothesis was derived from Pender's proposition that self-efficacy is determined to be one of the most important predictors of human behavior. Individuals with high SE expectations are more likely to set higher goals, and expect their efforts will produce a favorable result and believe they can overcome obstacles to achieve their goals (Pender et al., 2011).

To determine whether there was a significant association between mean scores on the Exercise Self-Efficacy Scale and the mean score on the Commitment to a Plan of Physical Activity Scale, Kendall τ_b was used. The Kendall τ_b statistic was computed comparing the scores for the mothers and daughters separately. It was determined there was not a significant relationship between the exercise self-efficacy and a commitment to a plan of physical activity among mothers, ($\tau_b = .08, p = .285$). However, there was a significant relationship between the daughters', exercise self-efficacy and commitment to PA ($\tau_b = .27, p = .001$). Thus, Hypothesis 2 was partially supported. These results indicate that as the mean of exercise self-efficacy increases, so does the mean of commitment for physical activity. Therefore, the stronger a daughter belief she can exercise in the face of obstacles, the greater her commitment to PA.

Hypotheses 3

Hypothesis 3, is there will be a significant relationship between activity related affect and commitment to a plan of physical activity Hispanic mothers and daughters. This hypothesis was derived from Pender's proposition that behaviors associated with a positive activity-related affect are more likely to be repeated than those that invoke a negative response (Pender et al., 2006).

To determine whether there was a significant association between mean scores on the Physical Activity Related Affect Scale and on the Commitment to a Plan of Physical Activity Scale, Kendall τ_b was used. The Kendall τ_b statistic was computed comparing the scores for the mothers and daughters separately. Correlational Kendall τ_b analysis did not reveal a significant relationship between physically active related affect and commitment of mothers ($\tau_b = .13, p = .11$). Similarly, there was not a significant relationship between physically active related affect and commitment of daughters, ($\tau_b = .01, p = .22$). Thus, this hypothesis was not supported. The results did not indicate a positive correlation between physical activity related affect and a commitment to physical activity.

Hypotheses 4

Hypothesis 4, is there will be a significant relationship between commitment to a plan of physical activity and participation in physical activity among Hispanic mothers and daughters. This hypothesis was derived from the theoretical proposition that once an individual is committed to a specific behavior, it is posited the person will engage in the behavior.

To determine whether there was a significant association between the mean score on the self-reported physically activity scores: Lifestyle Health Promotion Questionnaire

(LPM) for mothers, the Adolescent Lifestyle Questionnaire (ALQ) for the daughters, the Physical Activity Recall (PAR) and the mean score on the Commitment to a Plan of Physical Activity Scale, Kendall τ_b was used. The Kendall τ_b statistic was computed comparing the scores for the mothers and daughters separately.

Correlational Kendall analysis revealed a significant relationship between LPM and PAR among mothers, ($\tau_b = .33, p = .001$), and between the ALQ Means and PAR for the daughters ($\tau_b = .26, p = .002$). This hypothesis was supported. These results indicate that as self-reported activity increases, so does commitment for physical activity. Therefore, the greater the perception of physical activity among the mothers and daughters, the greater the level of commitment to physical activity.

Hypothesis 5

Hypothesis 5, stated there will be significant differences in societal norms, exercise self-efficacy, activity related affect and commitment to exercise among Hispanic women and their daughters. This hypothesis was derived from the theoretical proposition that when societal norms are supported; when an individual experiences perceived ESE; and when positive emotions or affect are linked with PA, the chances of commitment and physical activity are increased.

To determine differences in the mother-daughter paired group, paired t-tests were conducted.

The paired t tests revealed significant differences between Hispanic women and their daughters on social norms, ($t = -3.78, p < .000, 95\% \text{ CI } [-.48, -.15]$) and exercise self-efficacy, ($t = 6.63, p = .000, 95\% \text{ CI } [-1.1 \text{ and } -.60]$). However there were no significant differences noted regarding physical activity related affect ($t = -1.67, p = .098, 95\% \text{ CI } [-$

.20, .28]) and commitment to a plan of physical activity, ($t = -1.67$, $p = .098$, 95% CI [.024-.270]). The paired t test for the mother daughter group also revealed that there was not a significant difference in means scores on physical activity related affect, ($t = 1.6$, $p = .10$, 95% CI [-.20, .28]) or commitment to PA among the mothers and daughters, ($t = -1.7$, $p = .098$, 95% CI [.024-.270]). However, the paired t -test for the mother daughter group revealed that there were significant differences in social norm, ($t = -3.78$, $p < .000$, 95% CI [-.48, -.15]); and exercise self efficacy scores ($t = 6.63$, $p = .000$, 95% CI [-1.1 and -.60]). Thus, this hypothesis was partially supported. These results indicate that the daughters have higher social norms mean scores ($M = 2.1$ for daughter and $M = 1.8$ for mothers), and higher self-efficacy mean scores ($M = 3.2$ for daughters and $M = 2.3$ for mothers). Therefore, for daughters, the greater expectation that others think they should exercise, the greater the commitment to physical activity. Also, the more the daughters think they can exercise regardless of obstacles, the higher their commitment to physical activity will be.

Hypothesis 6

Hypothesis 6 stated Societal norms, exercise self-efficacy, activity related affect and commitment to a plan of physical activity of Hispanic mothers will be significant predictors of physical activity levels of the Hispanic daughters. This hypothesis was derived from the theoretical proposition that societal norms are expectations of significant others that set values for performance which individuals may embrace or reject. Also exercise self-efficacy and physical activity related affect have an effect on an individual's commitment for exercise.

A multiple regression analysis was conducted to evaluate how well societal norms, exercise self-efficacy, and activity related affect measures predicted commitment to a plan of physical activity for the mothers and the daughters.

The predictor variables for the daughters were: exercise self-efficacy, social norms and physical activity enjoyment, and the response variable was commitment to a plan of physical activity. The three-predictor variables were derived from theoretical propositions that these variables have a profound effect on commitment to physical activity.

In order to test the prediction model, multiple regression analysis was used to explore the following regression model for the mothers: $Y = \alpha + \beta_1 X + \beta_2 X_2 + \beta_3 X_3 + e$

Y = Commitment for mothers

X_1 = Exercise Self Efficacy for mothers

X_2 = Societal Norms for Mothers

X_3 = Physical Activity Enjoyment for Mothers

As shown in Tables 8, R^2 for the multiple regression did not reveal a significant relationship between the mothers', exercise self-efficacy, societal norms, and physical activity enjoyment and commitment to physical activity. The total $R^2 = .04$ which explains only 4% of the variance for mothers' commitment for physical activity.

Table 8

Variable	B	SE	<i>t</i>	<i>p</i>	95% CI
----------	---	----	----------	----------	--------

ESE	.003	.09	.02	.98	-.18, .18
NORMS	.07	.09	.63	.53	-.13, .24
PACES	.18	.09	1.63	.106	-.34, .346

Multiple Regression Analysis for Mothers' Commitment for Physical Activity

with variables: exercise self-efficacy, societal norms, and physical activity related affect

In order to test the prediction model, multiple regression analysis was used to explore the following regression model: $Y = \alpha + \beta_1 X + \beta_2 X_2 + \beta_3 X_3 + e$

Y = Commitment for daughters

X_1 = Exercise Self Efficacy for daughters

X_2 = Societal Norms for Daughters

X_3 = Physical Activity Enjoyment for Daughters

As shown in Table 9, multiple regression revealed a relationship between the daughters', societal norms, $\beta = .28$, $p = .01$; and exercise self-efficacy, $\beta = .25$, $p = .02$. The total $R^2 = .213$ which explains 21 % of the variance for the daughters' commitment for PA.

Table 9

Multiple Regression Analysis for Daughters' Commitment for Physical Activity

with variables: exercise self-efficacy, societal norms, and physical activity related affect

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

Variable	R	SE	t	p	95% CI
ESE	.253	.058	2.3	.02*	.020, .251
NORMS	.286	.104	2.6	.01**	.067, .482
PACES	.091	.118	.87	.388	-.133, .339

Additional Ancillary Findings

A multiple regression analysis was conducted among mothers and daughters to evaluate additional variable measures to predicted commitment to a plan of physical activity. The predictor variables of the mothers were; exercise self-efficacy, lifestyle health promotion (self- report physical activity), societal norms, acculturation, physical activity enjoyment and age. The response variable was commitment to a plan of physical activity.

In order to test the prediction model, multiple regression analysis was used to explore the following regression model: $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$

Y = Commitment to physical activity for mothers

X₁ = Exercise Self Efficacy for mothers

X₂ = Lifestyle health promotion self PA report

X₃ = Societal Norms for Mothers

X₄ = Physical Activity Enjoyment for Mothers

X₅ = Age for Mother

X₆ = Acculturation Mother

As shown in Table 10, multiple regression revealed a relationship between the mothers' independent variables lifestyle, ($\beta = .57, p = .000$). The total $R^2 = .38$ which explains 38 % of the variance for the mothers' commitment for PA. Age was not a significant factor with mothers and commitment to physical activity.

Table 10

Multiple Regression Analysis for Mothers' Commitment for Physical Activity with variables: exercise self-efficacy, lifestyle promotion, societal norms, acculturation, activity related affect and age.

Variable	B	SE	t	p	95% CI
ESE	-.07	.08	1.26	.21	-.06, .25
LPM	.57	.10	6.0	.000**	.41, .81
NORMS	.12	-.06	1.26	.21	-.06, .25
SASH	.01	.06	.15	.88	-.12, .14
PACES	.13	.08	1.35	.18	-.05, .27
AGE	-.10	.01	-1.04	.30	-.03, .01

** $p < .01$

A multiple regression analysis was conducted also for the daughters to evaluate additional variable measures to predict commitment to a plan of physical activity. The predictor variables for the daughters were exercise self-efficacy, adolescent lifestyle questionnaire, societal norms, physical activity enjoyment and age while the response variable was commitment to a plan of physical activity.

In order to test the prediction model, multiple regression analysis was used to explore the following regression model: $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + e$

Y = Commitment to physical activity for daughters

X_1 = Exercise Self Efficacy for daughters

X_2 = Adolescent health promotion self PA report

X_3 = Societal Norms for Daughters

X_4 = Physical Activity Enjoyment for Daughters

X_5 = Age for Daughter

As shown in Table 11, the daughters' independent variables; PA self report - adolescent lifestyle, ($\beta = .45$, $p = .000$) and societal norms, ($\beta = .23$, $p = .02$); with the daughters' predictor variable and commitment to physical activity. The total $R^2 = .35$ explains 35% of the variance for the daughters' commitment for PA. Age was not a significant factor with mothers or daughters and commitment to physical activity.

Table 11

Multiple Regression Analysis for Daughters' Commitment for Physical Activity: exercise self-efficacy, lifestyle promotion, societal norms, acculturation, activity related affect and age.

Variable	B	SE	<i>t</i>	<i>p</i>	95% CI
ESE	.02	.06	.16	.87	-.11, .13
ALQ	.45	.06	3.9	.00**	.11, .35
NORMS	.23	.10	2.3	.02	.03, .42
PACES	.07	.11	.73	.46	-.13, .30
AGE	-.10	.04	-1.0	.30	-.12, .04

** $p < .01$

A multiple regression analysis was conducted on mothers to evaluate additional variable measures to predict physical activity. The predictor variables were age, education level, hours of sleep, years living in the U.S. and BMI, and the response variable was Actigraph®.

In order to test the prediction model, multiple regression analysis was used to explore the following regression model: $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e$

Y = Actigraph® for mothers

X_1 = age for mothers

X_2 = educational level mothers

X_3 = hours of sleep for mothers

X_4 = years living in the U.S. for Mothers

X_5 = BMI for Mother

As shown in Table 12, multiple regression did not reveal a relationship between the mothers' independent variables age, educational level, hours of sleep, years living in the U.S., or BMI and the Actigraph®. The total $R^2 = .035$ which explains 3.5 % of the variance for the mothers' Actigraph®, which is not a strong predictor for Actigraph® results.

Table 12

Multiple Regression Analysis for Mothers' Actigraph® with variables: age, educational level, hours of sleep, years living in the U.S., BMI.

Variable	β	SE	t	p	95% CI
----------	---------	----	-----	-----	--------

Age	.05	.19	.35	.72	-.314, .447
Educational level	.02	.32	.11	.91	-.61, .69
Hours of sleep	-.09	.98	-.71	.48	-2.65, 1.26
Years living in the U.S.	-.18	.12	-1.23	.22	-.40, .09
BMI	-.02	.16	-.16	.87	-.34, .29

A multiple regression analysis was conducted on daughters to evaluate additional variable measures to predict physical activity. The predictor variables were age, education level, hours of sleep, years living in the U.S. and BMI, and the response variable was Actigraph®.

In order to test the prediction model, multiple regression analysis was used to explore the following regression model: $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + e$

Y = Actigraph® for daughters

X_1 = age for daughters

X_2 = educational level daughters

X_3 = hours of sleep for daughters

X_4 = years living in the U.S. for Daughters

X_5 = BMI for Daughter

As shown in Table 13, multiple regression did not reveal a relationship between the daughters' variables age, educational level, years living in the U.S., or BMI and the Actigraph®. There was a relationship between sleep and the Actigraph®, ($\beta = -.44$, $p = .001$). The total $R^2 = .22$ explains 22% of the variance for the daughters' Actigraph®.

Table 13

Multiple Regression Analysis for Daughters Actigraph® with variables: age, educational level, hours of sleep, years living in the U.S., BMI.

Variable	β	SE	t	p	95% CI
Age	-.34	2.5	-.99	.32	-7.57, 2.57
Educational level	.18	2.8	.48	.63	-4.2, 6.8
Hours of sleep	-.44	1.04	-3.5	.001**	-5.7, -1.5
Years living in the U.S.	.16	.733	1.0	.31	-.72, 2.2
BMI	.027	.25	.21	.83	-.45, .56

To determine whether there was a significant association between the mean score on the demographic variables; age, educational level, hours of sleep, years living in the U.S., and BMI and the mean score of percentage of physical activity on the Actigraph®, Kendall's (τ_b) was used. The Kendall's (τ_b) statistic was computed comparing the scores for the mothers and daughters separately. It was found that Correlational Kendall's (τ_b) analysis did not reveal a significant relationship between demographic variables for the moms, age, ($\tau_b = .03, p = .766$); educational level, ($\tau_b = -.03, p = .740$); hours of sleep, ($\tau_b = .01, p = .884$); years in the U.S., ($\tau_b = -.13, p = .151$); and BMI, ($\tau_b = .20, p = .836$), and Actigraph® measures for the moms. It was also found that Correlational Kendall's τ_b analysis did not reveal a significant relationship between demographic variables for the daughters, age, ($\tau_b = -.15, p = .112$); educational level, ($\tau_b = -.11, p = .265$); hours of sleep, ($\tau_b = -.04, p = .663$); years in the U.S., ($\tau_b = -.08, p = .390$); and BMI, ($\tau_b = -.03, p = .727$), and Actigraph® measures for the daughters. When generating the Kendall (τ_b) among mother daughter relationships, there was not a

significant association between the mean score on the demographic variables and the mean score on the Actigraph®, for the mothers and daughters.

A multiple regression analysis was conducted on mothers to evaluate additional variable measures to predict physical activity. The predictor variables were self-report lifestyle PA, Physical Activity Record, and commitment to PA, and the response variable was Actigraph®.

In order to test the prediction model, multiple regression analysis was used to explore the following regression model: $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$

Y = Actigraph® for mothers

X_1 = Physical Activity Record mothers

X_2 = self-report physical lifestyle activity mothers

X_3 = commitment for PA for mothers

As shown in Table 14, multiple regression did predict physical activity by Actigraph® with the mothers' variables PAR, self-report lifestyle PA, or commitment to physical. The total $R^2 = .053$ which explains 5.3 % of the variance for the mothers' Actigraph®, which is not a strong predictor for Actigraph® results.

Table 14

Multiple regression for mothers' PAR, self-report PA, and commitment on Actigraph®.

Variable	B	SE	<i>t</i>	<i>p</i>	95% CI
PAR	-.13	.64	-.74	.46	-.64, .87
Self-report PA	.29	2.37	1.73	.09	-1.8, .81

Commitment	-.01	2.2	-.01	.93	-4.78, 4.37
------------	------	-----	------	-----	-------------

A multiple regression analysis was conducted on daughters to evaluate additional variable measures to predict physical activity. The predictor variables were self-report lifestyle PA, Physical Activity Record, and commitment to PA, and the response variable was Actigraph®.

In order to test the prediction model, multiple regression analysis was used to explore the following regression model: $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3$

Variable	B	SE	<i>t</i>	<i>p</i>	95% CI
----------	---	----	----------	----------	--------

Y = Actigraph® for daughters

X_1 = Physical Activity Record daughters

X_2 = self-report physical lifestyle activity daughters

X_3 = commitment for PA for daughters

As shown in Table 15, multiple regression did predict physical activity by Actigraph® with the daughters' variables PAR, self-report lifestyle PA, or commitment to physical. The total $R^2 = .045$ which explains 4.5 % of the variance for the mothers' Actigraph®, which is not a strong predictor for Actigraph® results.

Table 15

Multiple regression for daughters' PAR, self-report PA, and commitment on Actigraph®.

PAR	-.007	.796	-.047	.963	-4.47, 7.02
Self-report PA	.175	1.5	1.12	.267	-1.63, 1.55
Commitment	.06	2.87	.44	.66	-1.3, 4.58

Chapter 5

Discussion of Findings

The purpose of this study was to determine factors affecting commitment to a plan of PA among low-income Hispanic mothers and their daughters. This chapter includes an interpretation of the findings of the hypothesized relationships based on the theoretical propositions of the Health Promotion Model (Pender et al., 2011).

Exercise Norms and Commitment

The mean score for exercise norms for the mothers, ($M = 1.8$, $SD = .78$), and for the daughters in the sample ($M = 2.1$, $SD = .71$) indicated that both the mothers and

daughters felt that family members, close friends and physician thought they should exercise. Examination of response frequencies to societal norms, indicated mothers and daughters had similar feelings about how people expected them to exercise. The finding that mothers and daughters both felt that their families expect them to exercise is consistent with Pender's findings that living arrangements were a significant predictor of health promotion activities (Wang, 1999). The findings of the daughters' perception of their peers not expecting them to exercise supports findings in Wu and Pender's (2005) structural model study indicating that societal norms were not predictors of exercise among females in the 8th and 9th grades.

Mean scores for commitment for PA for mothers, ($M = 1.7$, $SD = .50$) and mean scores for commitment for PA for daughters, ($M = 1.8$, $SD = .48$) were based on a 3-point Likert scale, ranging from never to often, indicating that both mothers and daughters sometimes plan for physical activity.

Hypothesis I was derived from Pender's proposition that societal norms influences health promoting behavior directly and indirectly (Pender et al., 2011). This hypothesis was not supported among social norms and commitment for mothers. However the correlational Kendall's (τ_b) analysis did reveal a positive correlation between societal norms and commitment for daughters, indicating that among daughters higher commitment scores are associated with higher societal norms.

Societal norms set standards for performances, such as PA, that people may accept or reject. Individuals vary as to how receptive they may be of others encouragement or social pressures (Pender, et al., 2011). Pender posits that some cultures may place more emphasis on interpersonal influences than others, such as in the Hispanic population

(Pender, et al., 2011). In the Hispanic culture, *familismo* may encourage individuals to engage in certain behaviors for the good of the family and not for individual gain (Pender, et al., 2011). The concept of *familismo* may explain why this hypothesis was partially supported. Kendall tau_b did not reveal a positive correlation between mothers and societal norms and commitment, which may be due to the mothers' feelings that if PA does not benefit the good of the family, then it is not important to them.

Exercise Self-Efficacy and Commitment

Theorists posit that exercise self-efficacy is noted to be a predictor of exercise among the majority of youth (Pender et al., 2002; Robbins et al., 2004; Reynolds et. al., 1990; and Zakarian et al., 1994) and adults (Garcia & King, 1991; Poag & McAuley, 1992; & Sallis et al, 1988). Pender reports that when clients are in control of believing they can exercise in spite of adversity, and those with higher exercise self-efficacy scores will have a higher level of commitment for PA (Pender et al., 2011). Bandura (2002) also postulates the greater the perceived SE, the stronger and more persistent the individual will be in engaging in the behavior, regardless of how difficult or aversive the obstacles might be. Hypothesis 2 was derived from Pender's proposition that self-efficacy is determined to be one of the most important predictors of human behavior, and that individuals with high SE expectations are more likely to set higher goals, and expect their efforts will produce a favorable result and believe they can overcome obstacles to achieve goals (Pender et al., 2011).

For daughters, there was a significant positive correlation between commitment and exercise self-efficacy. These findings suggest that higher commitment scores are associated with higher exercise self-efficacy scores. Those individuals who have a higher

self-efficacy will believe they can participate in PA in the face of obstacles, and will have a higher commitment to PA.

The sample mean score for the mothers, ($M = 2.39$, $SD = .62$) was slightly lower than the sample mean score for the daughters, ($M = 3.26$, $SD = .91$). Scoring was based on a 4- point Likert scale, in which the higher the score, the stronger the belief the subject could engage in PA. The mean score for the mothers reflected they strongly believed they could not participate in PA in the face of obstacles, and the daughters' mean score reflected a moderately strong belief that they could engage in PA in the face of obstacles.

Wu and Pender (2002) examined the construct of exercise self-efficacy and determined through model testing that 19% of the variance in PA was explained by self-efficacy. This hypothesis is inconsistent with findings from other adult populations, but similar to the studies among youth. Previous studies have demonstrated exercise self-efficacy has a positive effect on PA among the Asian population, but not the Hispanic population, (Shin et al., 2001; Wu & Pender, 2002 and Yang et al., 2007).

This hypothesis was supported among daughters. Although Pender postulates that all cognitive perceptual factors influence health-promoting behavior, the mothers' exercise self-efficacy was not a positive effect on commitment of PA. Pender also states the ESE behavior are influenced by four principal sources of information: mastery expectatons (accomplishments), vicarious learning (modeling), verbal persuasion and somatic responses to specific situations to build self-competencies and confidence (Pender et al., 2011). Further investigation should be considered for objective measures for exercise self-efficacy and commitment in the Hispanic population. Pender posits that perceived competence or self-efficacy to carry out a specific behavior increases the likelihood of

commitment to action and actual performance of the behavior, (Pender, 2011), whereas in this study, there was not a positive correlation between self-efficacy and commitment of PA, but there was a positive correlation between the daughters and self-efficacy and commitment to PA. The findings that self-efficacy was not significantly associated with stronger commitment to PA is not consistent with previous studies (D'Alonzo, et al., 2004; Eyler, et al., 2002; Marquez et al., 2006).

Physical activity related affect and commitment to physical activity

Empirical evidence has shown that behaviors associated with a positive activity-related affect are more likely to be repeated than those that invoke a negative response (Pender et al., 2006). Activity-related affect (for exercise) is another HPM variable that is pertinent to this study. Activity-related affect refers to the subjective feelings individuals experience prior to, during, and after physical activity. These feelings stem from the stimulus properties connected to the behavioral event. These feelings can be mild, moderate, or strong and recur with subsequent acts of the behavior associated with the affective responses (Pender et al., 2011). The main proposition being tested was that PA related affect is expected have a positive relationship to commitment to PA.

The Physical Activity Enjoyment Scale (PACES) measures participant reported enjoyment.

Higher scores reflect higher enjoyment with PA. The mean scores for PACES among the mothers was ($M = 3.21$, $SD = 3.2$), while the mean score for daughters was ($M = 3.17$, $SD = .544$), on a 4-point Likert scale. These scores suggest that when the mothers and daughters did exercise, they enjoyed the PA experience. This finding is consistent with a

study by Robbins et al., (2004) that demonstrated enjoyment of PA was overall positively correlated with enjoyment of PA, ($r = .48, p < .001$) among adolescents.

The adult PACES tool was found to have high test-retest reliability, but further testing did not yield the same results for children, (Kendzierski & DeCarlo, 1991). Therefore a PACES tool was created for youth (Motl et al., 2001). In children, confirmatory factor analysis of the revised tool indicated the measurement model was a good fit, with interfactor correlations ranging between $r = 0.19$ and 0.45 which were noted as significant (Motl et al., 2001). This version of the PACES tool was tested across African-American and Caucasian girls with an outcome indicating a good fit.

This hypothesis did not reveal significant relationships between PA related affect and commitment to exercise among mothers, but revealed a significant positive correlation between PA related affect and commitment among daughters. Thus, this hypothesis was partially supported. There are three components that exist with activity-related affect: (1) emotional excitement to the specific act (act related); (2) the self-acting (self-related); and (3) the environment where the action takes place (context related), (Pender et al., 2006). The feelings related to the three components of activity-related affect vary in a range from negative to positive, and will have a direct response on the behavior (Pender, 2006). Consideration should be given to the specific components of activity related affect and use of more objective measures of physical activity enjoyment in future studies.

Lifestyle Profile, Adolescent Lifestyle Profile, Physical Activity Record, Physical Activity and Commitment

Empirical evidence has shown that once an individual is committed to a specific behavior, it is posited the person will engage in the behavior. Individual characteristics

influence health- promoting behavior (Pender et al., 2006). Validated self-report questionnaires were used for the mothers and daughters to assess physical activity lifestyle patterns, as well as Actigraph® measures. Self-report measures of PA are susceptible to inaccuracy and lack of precision since these measurements are dependent on the subjects' ability to recall and report PA (Freedson et al., 1998). Correlational Kendall's tau_b analysis revealed a positive relationship with self-reported measures (Lifestyle Profile for mothers, Adolescent Lifestyle Profile for daughters, and Physical Activity Record for both mothers and daughters) and commitment to PA. However there was not a positive relationship between the Actigraph® measures and commitment to PA. This hypothesis was partially supported.

These results indicate that although the mothers and daughters perceive they are physically active, the Actigraph® measures indicated that 71% of their time was spent in more sedentary activities for both the mothers and the daughters. During the time subjects were not sedentary, most subjects engaged in light activity (17% for moms, 15% for daughters), and very few engaged in vigorous (.3% for mothers and .5% for daughters) or very vigorous activity (.04% for mothers and .09% for daughters). This finding is supported by studies that have reported 74% of Hispanic women report no leisure time physical activity (Crespo et al., 2008) as well as decreased PA among young girls (MMWR, 2012). Limitations existed with the Actigraph study. Recommendations are to wear the Actigraphs® for 7 days for accurate activity measurements (Cain & Geremia, 2011). This study was limited to 3 days due to the limitations on use of the Actigraphs® that were borrowed from Michigan State University.

Social Norms, Exercise Self-Efficacy, Physical Activity Enjoyment related to commitment.

Theorists posit that societal norms are supported when an individual experiences perceived ESE and when positive emotions or affect are linked with PA, the chances of commitment and participation in PA is increased. Societal norms, exercise self-efficacy, activity related affect and commitment to a plan of PA of mothers and daughters were tested to see if these variables were predictors of physical activity. Empirical studies support the theoretical propositions and suggest that exercise self-efficacy, social norms, and physical activity enjoyment related to PA, mother-daughter relationships in childhood and early adolescence may not be well defined, but it appears that children of active mothers are twice as likely to be active than those with inactive parents (Freedson, 1991). Sallis et al., (1988) found significant correlations between energy expenditure and hard leisure activity among Mexican American mothers, and their 11 – year-old children. This hypothesis was partially supported by results in this study.

Societal Norms, Self-Efficacy, Activity Related Affect as predictors to a Commitment for a Plan of Physical Activity

Multiple regression did not reveal a significant relationship between societal norms, self-efficacy, and activity related affect on commitment to PA. The $R^2 = .04$, which explains only 4% of the variance for mothers' commitment for PA. Multiple regression did however reveal a relationship between the daughters' independent variables, NORMS, $\beta = .28$, $p = .01$; and ESE, $\beta = .25$, $p = .02$. The total $R^2 = .213$ which explains 21 % of the variance for the daughters' commitment for PA. Multiple regression exercise

self-efficacy, societal norms, and PA related effect was not a strong predictor for commitment of PA.

Previous studies have shown different outcomes with these predictor variables for PA, Shin et al., (2005) tested constructs from Pender's HPM to predict a commitment of PA among Korean adults. The path model accounted for 54% of the variance for a commitment to PA that supported effects of exercise self-efficacy, social support, and physical activity. Taymoori et al., (2010) evaluated the revised HPM (Pender et al, 2011) to predict physical activity in Iranian Boys. Taymoori et al., (2010) reported self-efficacy ($\beta = .28, p < .001$), enjoyment ($\beta = .26, p < .001$), and commitment to planning ($\beta = .13, p < .05$) were all directly associated with PA. The evaluation to predict physical activity explained 34% of the variance in PA and represented a good data fit ($\chi^2 = 9.12, df = 4, p = .058$).

Ancillary findings.

Factors extraneous to the main analyses were examined to determine effects on commitment to PA. To further test a prediction model with additional variables extraneous to the main analyses, a multiple regression was conducted with the variables exercise self-efficacy, lifestyle physical variables, societal norms, PA enjoyment, age and in addition for the mothers only, was acculturation. The multiple regression revealed a relationship between the mothers lifestyle physical variable ($\beta = .57, p = .000$) which explained 38% of the variance for the mothers' commitment for PA. The daughters' variables, exercise self-efficacy, adolescent lifestyle, societal norms, PA enjoyment and age that explained 35% of the variance for the daughters' commitment for PA. Age was not a significant factor for either the mothers or the daughters and commitment to PA. It

is important to note that the mothers' lifestyle physical variable and adolescent lifestyle variable are a self-report of physical activities, and therefore may not be a reliable or accurate account of actual PA. Individual characteristics influence health- promoting behavior (Pender et al., 2006). There is a well- established relationship between income and health. Income inequality affects health outcomes (Keller, et al., 2009). Higher acculturation level explained increased engagement in recommended levels of PA (Evenson et al., 2004; Marquez & McAuley).

The hypotheses for this study were partially supported. Further investigation is needed in analyzing the study tools in Spanish focusing on cultural factors. Also, PA levels as reported from the Actigraph® are below national recommendations, so questions related to PA may not be pertinent to those who do not participate in PA.

Another multiple regression analysis was conducted to evaluate variable measures to predicted PA. The predictors were age, education level, hours of sleep, years living in the U.S. and BMI, and the response variable was Actigraph®. Multiple regression did not reveal a relationship between the mothers' independent variables age, educational level, hours of sleep, years living in the U.S., or BMI and the Actigraph®. The total $R^2 = .035$ which explains 3.5 % of the variance for the mothers' Actigraph®. As shown in Table 14, multiple regression did not reveal a relationship between the daughters' independent variables age, educational level, years living in the U.S., or BMI and the Actigraph®. Sleep ($\beta = -.44, p = .001$) was a significant predictor of physical activity. The total $R^2 = .22$ explains 22% of the variance for the daughters' Actigraph®.

Multiple regression analysis was conducted to evaluate predictor variables of self-report measures of PA including the PAR, and commitment to PA. The response variable

was the Actigraph®. These variables did not predict physical activity, the total R^2 for the mothers was .053, or 5.3% of the variance for mothers' Actigraph®, and R^2 for the daughters was .045 or 4.5% of the variance for daughters' Actigraph®. Results from this study did not contain variables that predicted PA

Chapter 6

Summary, Conclusions, Implications and Recommendations

Summary

The purpose of this research was to examine the relationships among societal norms, exercise self-efficacy and activity related affect on commitment to a plan of PA in a sample of low-income Hispanic women and their daughters. Theoretical propositions derived from the Health Promotion Model (Pender, 2011) were tested.

Theorists posit that societal norms are expectations of significant others that set values for performance which individuals may embrace or reject (Pender et al., 2011). Societal norms enable individuals to understand acceptable behaviors within their peer group and provide groups with examples of desirable behaviors (Fleury & Lee, 2006), such as in PA. This relationship is supported by empirical literature (Kerr et al., 2002; Liu et al., 2009; Wu et al., 2005).

Self-efficacy is a predictor of participation in regular PA (Bandera 1997; Eyler, et al., 2002), and has been reported to be a common correlate of PA for Latinos (Marquez et al., 2006). This relationship is supported by empirical literature (Duffy et al., 1997; Garcia et al., 1995; Pender et al., 2001; Sallis et al., 1998; Shin et al., 2001; Taymoori et al., 2010; Wu et al., 2002).

Theorists posit that activity related affect determines whether the activity will be continued or maintained (Pender et al., 2011). This relationship is supported by empirical literature (Gauvin & Rejeski, 1993; Heitzler, et al.; Motl, et al., 2001; Pender, et al., 2004).

Theorists also posit once the individual is committed to a specific behavior, the person will engage in the behavior unless a barrier or competing demand that cannot be avoided occurs (Pender et al., 2006). This relationship is supported empirically (Nies et al., 1998; Pender et al., 2006; Shin et al., 2005; Taymoori et al., 2010).

Based on the theorized behavior-specific cognitions and affect relationships among societal norms, exercise self-efficacy and activity related affect, on the outcome of commitment to a plan of PA, the following hypotheses were derived for this study “Among Hispanic women and their daughters”:

1. There will be a significant relationship between societal norms and commitment to a plan of physical activity.
2. There will be a significant relationship between exercise self-efficacy and commitment to a plan of physical activity.
3. There will be a significant relationship between activity related affect and commitment to a plan of physical activity
4. There will be a significant relationship between commitment to a plan of physical activity and participation in physical activity.
5. Societal norms, self-efficacy, activity related affect and commitment to a plan of physical activity of mothers will be significant predictors of physical activity levels of the daughters.
6. There will be significant differences in societal norms, exercise self-efficacy, activity related affect and commitment to exercise between Hispanic women and their daughters.

The subjects in this study were recruited through the use of flyers in churches, priests' announcements of the study after Hispanic Catholic masses, and outreach by a Sister of Mercy nun from one of the parishes, the principal of Hispanic school, and a board member from one of the churches. The convenience sample consisted of 79 mothers and daughters who identified themselves as Hispanic. Two churches in one city were more alike than the mothers and daughters from the third city, which is near the lakeshore. The mothers from the lakeshore church were more hesitant to participate in the study than the mothers from the other two churches. Country of origin was not collected due to the churches do not have parishioner registrations. This information is not collected due to it is not part of the Hispanic culture, and many parishioners are not documented. The cabinet members of the church requested this information not be collected for the study to respect the participants. The priests stated that their church members come mainly from Mexico and Guatemala. Since the two churches were in similar low-income neighborhoods, the mothers may have been drawn to participate in the study to obtain the gift card for themselves and their daughters.

Data were analyzed using the Statistical Package for the Social Sciences (SPAWS) version 20.0 for Windows (IBM SPSS Statistics, 2012). Alpha coefficients were calculated for the Exercise Self- Efficacy Scale, Societal Norms Scale, PA Related Affect Scale, and Commitment to a Plan of PA for both the mothers and daughters. Alpha coefficients ranged from .68 to .94. Descriptive statistics were used to analyze sample characteristics. Kendall's τ_b correlation analysis was used to examine the relationship between study variables, and multiple regression analysis was used to test Hypothesis6. The level of significance used for hypothesis testing was $\alpha = .05$.

The first hypothesis, which stated there would be a significant relationship between societal norms and commitment, was partially supported. The second hypothesis, which stated there would be a significant relationship between exercise self-efficacy and commitment, was partially supported. The third hypothesis, which stated there would be a significant relationship between related affect and commitment to a plan of PA, was partially supported. The fourth hypothesis, which stated there would be significant relationship between commitment to a plan of PA and participation in PA, was partially supported. The fifth hypothesis, which stated there would be a significant relationship between societal norms, self-efficacy, activity related affect and commitment to a plan of PA of mothers will be significant predictors of PA levels of the daughters, was partially supported. The sixth hypothesis, which stated there would be a significant differences in societal norms, exercise self-efficacy, activity related affect and commitment to exercise between Hispanic women and their daughters was partially supported. Evidence in support of these hypotheses was found among daughters, in relation societal norms and exercise self efficacy, but not mothers.

In summary, theoretical propositions were tested to explain the relationships among Hispanic mothers and daughters societal norms, exercise self-efficacy, activity related affect and commitment to PA. Only the fourth hypothesis was supported for the mother and the daughter, and supports Pender's theoretical proposition that all factors are expected to be positively related to behavior. Continued work is warranted to differentiate further constructs.

Limitations

The major limitation of this study was the language barrier. Interpreters were used for the study, but twice the scheduled interpreter did not arrive for the study and alternates were used at the last minute. Another limitation was that the Actigraph® accelerometers were borrowed from Michigan State University (MSU) for a timeframe of January through March, so participants wore the accelerometers for three days. Due to licensing agreement, MSU could only load the Actigraph® Lite version for data collection. This version required the Actigraphs® to be downloaded and analyzed by another program at the university. So, at the time the mothers and daughters returned the Actigraph®, the Actigraph Lite version did not immediately display if the mothers and daughters wore the Actigraph®, or for how long they wore the Actigraph®. Minutes of wear time was analyzed at a later date at a local university using the Actigraph® software.

Seasonal effects were another potential limitation of the study. Data was collected in the snowy winter months of January, February and March, which may have resulted in the relatively low rates of PA. While the church locations were ideal venues from which to recruit participants, but the gathering spaces in which the women and their daughters could meet were often small. Although the study was designed for mothers and daughters, there were a few instances where a grandmother and granddaughter wanted to participate because the grandmother was the primary caregiver.

Conclusions

The main findings of this study support, as theorized, the relationship among societal norms, exercise self-efficacy and activity related affect, on commitment to a plan of PA. Theorized relationships between societal norms, exercise self-efficacy and PA related

affected appear to be significant more among the Hispanic daughters but not the mothers. The mothers may have poorly understood the Societal Norms Scale, which indicates further revision of the tool is needed specifically for the Hispanic population. A couple of mothers stated that the social norms did not pertain to them because they did not believe anyone they knew expected them to exercise.

Mothers and daughters with a sedentary lifestyle deprive themselves of the health benefits of PA and increase their risk for serious chronic diseases that may lead to an early death (Berg and Cromwell, 2002). Self-report perceptions of PA were rated higher among the mothers and daughters. Scores for total percentage of PA scores did not meet the recommended PA levels for moms or daughters. In fact, PA levels as measured by the Actigraph® were even lower in this study than NHANES (2010) study. Actigraph® data in this study demonstrated that both mothers and daughters had high percentages of sedentary time.

Daughters had significant relationships for both social norms and self-efficacy scores for commitment to PA whereas mothers did not have significant relationships for social norms and self-efficacy for commitment to PA. The relationship between self-efficacy and PA related affect among the mothers was in the opposite direction of what was expected, but similar to a study by Castro, Sallis, Hickmann, Lee and Chen (1999). It is unclear why these results occurred. However, research on unmeasured factors such as social support, specific barriers such as lack of transportation or lack of safety should be considered as additional factors that could affect PA (Allison, Dwyer and Makin, 1999).

Prediction for commitment for PA revealed societal norms, self-efficacy, and activity related affect was positively correlated for daughters and not mothers. This finding may

be related to the daughters' involvement with organized sporting activities such as soccer, basketball and dance. One mother stated she goes to Zumba® classes and looks forward to this activity, but most mothers stated they did not have any organized method of PA. Ancillary findings of age and BMI were not significant factors of commitment for PA for mothers and daughters. Further research is needed to understand the complexities of PA and the unique issues related to the Hispanic population.

Pender's HPM (2011) has limited cross-cultural testing, and no empirical examinations of factors that influence PA among Hispanic mothers and their daughters. This study generated new knowledge of factors associated with PA in the vulnerable Hispanic population, with 100% of the study population was Hispanic. This study generated new PA measurements of Hispanic mothers and daughters using the Actigraph®. This study strengthen the HPM to guide and advance clinical practice to evaluate the applicability of using factors in the HPM to promote healthy PA behaviors of moms and daughters and to begin to study complex issues of factors related to commitment to exercise. This study adds to the knowledge of PA and young Hispanic girls ages 8-12.

One strength of this research was that it made use of community-based participatory research (CBPR) methodology design (Kneipp, Lutz, Levonian, Cook, et al., 2013) in which academic community partnerships were formed to implement the study. CBPR is a collaborative approach to research where each partner brings unique strengths and assets that each brings to the research. The aim of combining expert knowledge and skill provide action for social change to improve the quality of the community's health and to eliminate health disparities (Israel, Engl, Schulz, & Parker, 2005). Although the PI did

not originally intend to make use of a community-based approach, a number of community-academic partnerships were formed during the planning and implementation of the study which facilitated community participation. For example, local churches donated space and agreed to advertise the study after Sunday Masses. Research assistants and translators were recruited from among the participating churches, while a local superstore provided gift cards for study subjects. In addressing healthcare issues, especially among the underserved, community based participatory approaches are key to the design and implementation of a successful intervention.

Implications for Practice

Findings from this study suggest that Hispanic mothers and daughters are not achieving the recommended amounts of PA. Furthermore, their perceptions of how much PA they are achieving are not consistent with actual measures. This indicates a need for education concerning PA on its importance and the type and frequency of PA that is needed to promote overall health. The use of parish nurses who are fluent in Spanish would provide an excellent way to reach the Hispanic population and to educate these mothers and daughters regarding health-promoting behaviors such as PA. Opportunities exist for mothers to be physically active while their daughters are attending religious education classes. Nurses can determine the types of PA that Hispanic moms and daughters would enjoy, then partner with various organizations to provide the various activities.

Nurses can become involved in policy making in PA. Policies are primary mechanisms for making environmental changes and include formal and informal rules, laws and regulations (Sallis et al., 2009). Incorporating support for PA venues would

increase access to individuals to promote physical activity. Policy making interventions include a multidimensional approach that should include a variety of settings. The clinic approach can increase collaboration between public and private sectors. School nurses should be employed in every school. Nurses can be the link to schools, communities, and homes to provide programs and interventions to increase physical activity (Diet et al., 2007). School employers dictate policies, resources, incentives and or deterrent to physical activity (Sallis et al., 2009).

There are various school based initiatives such as programs like Girls on the Move, an after school sponsored program conducted by MSU. Community based initiatives can include mass media, public policy, and environmental changes to promote physical activity. Programs that support physical activity such as a Walking School Bus (www.walking-school-bus.org) could be developed. The school bus stops several blocks from school, and the children are escorted the rest of the way to school by walking. Hospitals can partner with schools and health care plans to provide intensive community based programs for the mothers and daughters or for the entire family.

Faith based nurses can implement physical activity programs and education targeted at specific populations. Nurses need to be aware of resources in a community and need to be familiar with patients' interests, abilities, needs, and developmental appropriateness to ensure that children will like the physical activity, convenience and cost. Faith based nurses can educate families about PA environments in the home (Sallis et al., 2009).

The role of exercise self-efficacy should be explored in more detail as it pertains to Hispanics. A number of studies have indicated that self-efficacy is not highly associated with participation in PA among Hispanics. Collins, Lee, Albright and King (2004)

reported exercise self-efficacy did not improve among low-income Latinas following a pre-intervention PA course and Voorhees & Young (2003) found that for urban Latinas, exercise self-efficacy was negatively correlated with exercise and PA behaviors. These results suggest that with regard to PA and exercise, there may be other factors which take precedence over self-efficacy among Latinas. Environmental policy changes are needed to increase PA environments where people can be physically active.

Recommendations

Results and study limitations of this study suggest that further research is needed with the Hispanic population related to PA. More research is needed on tailoring measurement tools for this specific population. This study also suggests further research on exercise self-efficacy as related to commitment on PA. Since exercise-self efficacy is the single most predictor of a commitment to PA, intervention studies on self-efficacy and PA may provide a deeper understanding of the role of exercise self-efficacy and PA. Further research is also recommended on culturally appropriate intervention studies and PA throughout the seasons and with objective Actigraph® monitoring. An intervention study using the Actigraph® monitor could not only provide activity data, but could be used as a tool to provide feedback to mothers and daughters regarding how active they really are.

Researchers and practitioners should design multi-faceted interventions that incorporate Pender's cognitive, behavioral and physical domains. Individuals should be screened for sedentary behavior. Interventions to increase PA can include educational booklets, setting goals, and motivation techniques. Post study groups will be conducted at the churches to explain the results of the study and to educate on the importance of physical activity through the use of a Power Point with a bilingual translator, educational

booklets, and discussion on setting goals and motivation techniques. Interventions to improve PA among the Hispanic mothers and daughters must include the values and beliefs of the participants. Culture-based worldviews are essential to the success of such strategies and should be at the core from which interventions are planned (Berg and Cromwell, 2002).

Specific areas for future research may address the following research questions:

1. How can the nurse's role have a positive impact on exercise self-efficacy and physical activity?
2. What societal norms concepts are specifically related to the Hispanic culture, and how do these norms affect physical activity outcomes?
3. Does a tailored physical activity intervention have an effect on exercise self-efficacy and physical activity related affect?
4. What are health conditions are commonly seen in the Hispanic population, and does a physical activity intervention specifically tailored to prevent and/or manage a particular health condition have an effect on physical activity outcomes?
5. What are the physical activity outcomes for seven days of Actigraph® use in various seasons among Hispanic mothers and daughters?
6. What are culturally appropriate ways for the women and their daughters to participate in various types of physical activity?
7. What are the physical activity outcomes for caregivers and daughters related to physical activity related affect, societal norms and exercise self-efficacy?

8. How do the variables related to physical activity change over time for the daughters?

References

- Administration for Children and Families. (2012) <http://www.acf.hhs.gov>
- Amaro, H. & De la Torre, A. (2002). Public health needs and scientific opportunities in research Latinas. *American Journal of Public Health* 92(4), 525-529.
- Bacallao, M., & Smokowski, P. (2009). Entre dos mundos/between two worlds: Bicultural development in context. *Journal Primary Prevention*, 30: 421-451
- Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychology Review* 84(2), 191-215.
- Bandura, A. (2000). *Self-efficacy The exercise of control*. New York, New York: W.H. Freeman and Company.
- Berg, J., Cromwell, S., & Arnett, M. (2002). Physical activity: Perspectives of Mexican American and Anglo American midlife women. *Health Care for Women International*, 23, 894-904.
- Brislin, R.W. (1970). Back translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1, 185-216.
- Brodersen, N.H., Steptoe, A., Boniface, D., and Wardle, J. (2007). Trends in physical activity and sedentary behavior in adolescence: ethnic and socioeconomic differences. *British Journal Sports Medicine*, Vol 41, 140-144.
- Brownson, R., Eyler, A., King, A., Brown, D., Shyu, Y., & Sallis, J. (2000). Patterns and correlates of physical activity among U.S. women 40 years and older. *American Journal Public Health*, 90, 264.

- Burton, N., Turrell, G., & Oldenburg, B. (2003). Participation in recreational physical activity: why do socioeconomic groups differ? *Health Education & Behavior*, Vol. 30 (2), 225-244.
- Cain, K & Geremia, C (2011). Accelerometer Data Collection and Scoring Manual for Adult and Senior Studies. San Diego State University, San Diego, Ca.
- Carteret, M. (2011). Cultural values of Latino patients and families. Dimensions of Culture: cross-Cultural Communications for Healthcare Professionals.
www.dimensionsofculture.com/2011/03/cultural-values-of-latino-patients-and-families/
- Census Data. (2011). <http://2010census.gov>
- Centers for Disease Control. (2009). www.cdc.gov
- Centers for Disease Control. (2011). www.cdc.gov
- Centers for Disease Control (2012). www.cdc.gov
- Cohen, B., (2008). Explaining psychological statistics, third edition. Hoboken, New Jersey: John Wiley and Sons, Inc.
- Collins, R., Lee, R.E., Albright, C.L., & King, A.C. (2004). Ready to be physically active? The effects of a course preparing low income multiethnic women to be more physically active. *Health Education and Behavior*, 31, 47-64.
- Crags, C., Corder, K., van Sluijs, E. & Griffin, S. (2011). Determinants of change in physical activity in children and adolescents. *American Journal of Preventive Medicine*, 40(6), 645-658.
- Crespo, C.J., Smit, E., Andersen R.E., Carter-Pokras, O., & Ainsworth, B.E. (2002). Race/ethnicity, social class and their relation to physical inactivity during leisure

- time: Results from the third national health and nutrition examination survey, 1988-1994. *American Journal of Preventive Medicine*, 18(1), 46-53.
- Crocker, P. R. E., Bouffard, M., & Gessaroli, M.E. (1995). Measuring enjoyment in youth sport setting: A confirmatory factor analysis of the Physical Activity Enjoyment Scale. *Journal of Sport & Exercise Psychology*, 17(2), 200 – 205.
- Crossman, A., Sullivan, A, & Benin, M. (2006). The family environment and American adolescents' risk of obesity as young adults. *Social Medicine*, 63(9), 229-247.
- D'Alonzo, K.T., Stevenson, J.S., & Davis, S. E. (2004). Outcomes of a program to enhance exercise self-efficacy and improve fitness in Black and Hispanic college-age women. *Research in Nursing & Health*, 27, 357 – 369.
- Davison, K.K., Cutting, T.M., & Birch, L.L. (2003, May). Parents' activity-related parenting practices predict girls' physical activity. *Medicine and Science in Sports & Exercise*, 1589-1595.
- Delgado, J.L. (2010). The Latina guide to health consejos and caring answers. In Delgado, J. L., *Caring for ourselves: Body, Mind, and Spirit* (p. 62). New York: Newmarket Press.
- Department of Health and Human Services 1996
- Desmond, S.M., Price, J.H., Lock, R.S., et al. (1990). Urban Black and White adolescents' physical fitness status and perceptions of exercise. *Journal of School Health*, 60(5), 220-226.
- Dixon, S. Graber, J., & Brooks-Gunn, J. (2008). The roles of respect for parental authority and parenting practices in parent-child conflict among African

American, Latino, and European American Families. *Journal of Family Psychology*, 22(1), 1-10.

doi: 10.1037/0893-3200.22.1.1

Driscoll, A.K., Russell, S.T. & Crockett, L. J. (2007). Parenting styles and youth well-being across immigrant generations. *Journal of Family Issues*, 29, 185 - 208

Duda, J. (1998). *Advances in sport and exercise psychology measurement fitness information*. Morgantown, West Virginia: Fitness Information Technology, Inc.

Duffy, M.E. (1997). Determinants of reported health promotion behaviors in employed Mexican American women. *Health Care for Women International*, 18(2), 149-163.

Durand, T. (2011). Latina mothers' cultural beliefs about their children, parental roles, and Education: Implications for effective and empowering home-school partnerships.

Eaton, D., Kann, L., Kinchen, S., Shanklin, S., Flint, K., Hawkins, J., Harris, W. et al., (2012). Youth risk behavior surveillance – United States, 2011. *Morbidity and Mortality Weekly Report (MMWR)*. 61, 1-45. www.cdc.gov

Ellison, J., Jandorf, L., & Duhamel, K. (2011). Assessment of the Short Acculturation Scale for Hispanics (SASH) among low-income, immigrant Hispanics. *Journal of Cancer Education*, 26, 478-483.

Evans, N., Gilpin, E., Farkas, A.J., Shenassa, E., & Pierce, J. (1995). Adolescents' perceptions of their peers' health norms. *American Journal of Public Health*, 85, 1064-1069.

- Evenson, K., Sarmiento, O., & Ayala, G. (2004). Acculturation and physical activity among North Carolina Latina immigrants. *Social Science & Medicine*, 59, 2509-2522.
- Evenson, K., Sarmiento, O., Tawney, K., Macon, M.L., & Ammermann, A.S. (2003). Personal, social, and environmental correlates of physical activity in North Carolina Latina immigrants. *American Journal of Preventive Medicine*, 25 (3Si), 77-85.
- Eyler, A. A., Matson-Koffman, D., Young, D. R., Wilcox, S., Wilbur, J., Thompson, J. L., ... Evenson, K. R. (2002). Quantitative study of correlates of physical activity in women from diverse racial/ethnic groups Women's Cardiovascular Health Network Project introduction and methodology. *American Journal of Preventive Medicine*, 25(3Si), 5-14.
- Faul, F., Erdfelder, E., Lang, A-G, & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39 (2), 175-191.
- [Fitness.gov/better health/ppar.pdf](https://fitness.gov/better-health/ppar.pdf)
- Flegal, K., Carroll, M., Ogden, C., & Curtin, L. (2010). Prevalence and trends in obesity among US adults, 1999-2008. *The Journal of the American Medical Association*, 303(3), 235-241.
- Fleury, J., & Lee, S. M. (2006). The social ecological model and physical activity in African American women. *American Journal of Community Psychology*, 37, 129-140.

- Garcia, A.W. & King, A.C. (1991). Predicting long-term adherence to aerobic exercise: A comparison of two models. *Journal of Sports & Exercise Psychology*, 13, 394-410.
- Garcia, A., Norton Broda, M., Frenn, M., Coviak, C., Pender, N., & Ronis, D. (1995). Gender and developmental differences in exercise beliefs among youth and prediction of their exercise behavior. *Journal of School Health*, 65, 213-219.
- Gauvin, L., & Rejeski, W.J. (1993). The exercise induced feeling inventory: Development and initial validation. *Journal of Sport & Exercise Psychology*, 15, 403-423.
- Gordon-Larsen, Harris, K., Ward, D & Popkin, B., (2003). Acculturation and overweight-related behaviors among Hispanic immigrants to the US: the National Longitudinal Study of Adolescent Health. *Social Science & Medicine* 57 (11), 2023-2034.
- Giesbrecht, N. & Dick, R. (1993). Societal norms and risk-taking behavior: inter-cultural comparisons of casualties and alcohol consumption. *Addiction*, 88, 867-876.
- Gulsvik, A., Thelle, D., Samuelsen, S., Myrstad, M., Mowe, M., & Wyller, T. (2012). Ageing, physical activity and mortality-a 42-year follow-up study. *International Journal of Epidemiology*, 41(2), 521-530.
- Gustafson, S.L., & Rhodes, R.E. (2006). Parental correlates of physical activity in children and early adolescents. *Sports Medicine*, 36(1), 79-97.

- Hahn, R.A., Teutsch, S.M., Rothenberg, R.B., & Marks, J.S. (1990). Excess deaths from nine chronic diseases in the United States, 1986. *Journal of the American Medical Association*, 264 (20), 2654-2659.
- Hallal, P., Bauman, A., Heath, G., Kohl, H. (2012). Physical activity: more of the same is not enough. *The Lancet*, 380, 190-191. Doi:10.1016/S0140-6736(12)61027-7
- Haskell. W.L., Lee, I.M., Pate, R.R., Powell, K.E., Blair, S.N., Franklin, B.A., Macera, C.A., Heath, G.W., Thompson, P.D., & Bauman, A. (2007). Physical activity and public health: updated recommendation for adults from the American College of sports medicine and the American Heart Association. *Medicine Science Sports Exercise*, 39(8), 1423-1424.
- Healthy people.gov/ 2012/LH1/2020 indicators.aspx retrieved July 1, 2012
- Hearst, M., Patnode, C., Sirard, J., Farbakhsh, K., & Lytle, L. (2012). Multilevel predictors of adolescent physical activity; a longitudinal analysis. *International Journal of Behavior*, 9(8) 1-10.
- Heitzler, C.D., Lytle, L.A., Erickson, D.J., Barr-Anderson, S., & Sirard, J.R., (2010). Evaluating a model of youth physical activity. *American Journal health Behavior*, 34 (5), 593-606.
- Henderson, K., & Ainsworth, B. (2003). A synthesis of perceptions about physical activity among older African American and American Indian women. *American Journal of Public Health*, 93(2), 313-317.
- Himmelgreen, D., Perez-Escamilla, R., Martinez, D., Bretnall, A., Eells, B., Peng, Y., & Bermudez, A. (2004). The longer you stay, the bigger you get: Length of time

and language use in the U.S. are associated with obesity in Puerto Rican Women.

American Journal of Physical Anthropology, 125, 90-96.

Hunt, L., Schneider, S. & Comer (2004). Should “acculturation” be a variable in health research? A critical review of research on US Hispanics. *Social Science & Medicine*, 59, 973-986.

HealthyPeople.gov. (2012). <http://healthypeople.gov/2020/LHI/default.aspx>

Im, E-O, Lee, B., Hwang, H., Yoo, K., Chee, W., Stuifbergen, A., Walker, L....(2010).

“A waste of time”: Hispanic women’s attitudes toward physical activity. *Women & Health*, 50 (6), 563-579.

Jackson, A, Blair, S., Mahar, M., Wier, L., Ross, R., Stuteville, J. (1990). Prediction of functional aerobic capacity without exercise testing. *Medicine & Science in Sports & Exercise*, 22, 863-870.

Jackson, A., Beard, E., Wier, L. Ross, Stuteville, J., Blair, S. (1995). Changes in aerobic power of men ages 25-70 y. *Medicine & Science in Sports & Exercise*, 27, 113-120.

Jackson, A., Wier, L., Aers, G., Beard, E., Stuteville, J., Blair, S. (1996). Changes in aerobic power of women, ages 20 to 64 y. *Medicine & Science in Sports & Exercise*, 28, 884-891.

Jurca, R., Jackson, A., LaMonte, M., Morrow, J., Blair, S., Wareham, J.... Laukkanen, R. (2005). Assessing cardiorespiratory fitness without performing exercise testing. *American Journal of Preventive Medicine*, 29 (3), 185- 193.

- Keller, C., Fleury, J., Gonzalez Castro, F., Ainsworth, B., & Perez, A. (2009). Moderators of physical activity in Hispanic women. *Hispanic Health Care International*, 7(2), 60-71.
- Kelly, L.A., Reilly, J.J., Grant, S., & Patron, J.Y. (2004). Objective measurement of physical activity in pre-school children: Comparison of low accelerometers against direct observation. *Medicine & Science in Sports & Exercise*, 36, s329
- Kendzierski, D., DeCarlo, K. (1991). Physical Activity Enjoyment Scale: Two validation studies. *Journal of Sport and Exercise Psychology*, 13(1), 50-64
- Kerr, M. J, Lusk, S. L., & Ronis, D.L. (2002). Explaining Mexican American workers' hearing protection use with the Health Promotion Model. *Nursing Research*, 51(2), 100-109.
- King, A.C., Castro, C., Wilcox, S., Eyler, A.A., Sallis, J.F., & Brownson, R. C. (2002). Personal and environmental factors associated with physical inactivity among different racial-ethnic groups of U.S. middle-aged and older-aged women. *Health Psychology*, 19(4), 354-364.
- Kim, S., Glynn, N., Kriska, A, Barton, B., Kronsberg, S., Daniels, S., ...Liu, K. (2002). Decline in physical activity in black girls and white girls during adolescence. *The New England Journal of Medicine*, 347 (10), 709-715.
- Kneipp, S., Lutz, B.J., Levonian, C, Cook, Hamilton, J., Roberson, D. (2013). Womens' experience in a Community – Based Participatory Research randomized controlled trial. *Qualitative Health Research*, June 23(6); 847 – 860.
- Kohl 3rd, H., Craig, C., Lambert, E., Inove, S., Alkandari, J., Leetongin, G., Kahlmeier, S.

- (2012). The pandemic of physical inactivity: global action for public health. *The Lancet*, 380, 294-305. Doi:10.1016/S0140-6736(12)60898-8
- Lee, I-M., (2010). Physical activity and cardiac protection. *Current Sports Medicine Med. Rep.*, 9 (4), 214-219.
- Liu, J., Probst, J.C., Harun, N., Bennet, K., & Torres, M.E. (2009). Acculturation, physical activity, and obesity among Hispanic adolescents. *Ethnicity & Health*, 14 (50), 509-525.
- Markides, K. & Coreil, J. (1986). The health of Hispanics in the Southwestern United States: an epidemiologic paradox. *Public Health Report* 101(3), 253-265.
- Marin, G. & Sabogal, F. (1987). Development of a short acculturation scale for Hispanics. *Hispanic Journal of Behavioral Sciences*, 9(2), 183-205.
- Marquez, D.X., & McAuley, E. (2006). Psychosocial correlates and outcomes of physical activity among Latinos: A review. *Hispanic Journal of Behavioral Science* 26(2), 195-229.
- Marquez, D. & McAuley, E. (2006). Social cognitive correlates of leisure time physical activity among Latinos. *Journal of Behavioral Medicine*, 29 (3), 281-288.
- Merten, M.J., & Henry, C.S., (2011). Family structure, mother-daughter relationship quality, race and ethnicity, and adolescent girls' health risks. *Journal of Divorce & Remarriage*, 52, 164-186.
- Mier, N., Ory, M.G., & Medina, A.A., (2010). Anatomy of culturally sensitive interventions promoting nutrition and exercise in Hispanics: A critical examination of existing literature. *Health Promotion Practice*, 11, 541-554.

- Moore, J., Yin, Z., Hanes, J., Duda, J., Gutin, B., Barbeau, P. ,(2001). Measurements of enjoyment of physical activity in adolescent girls. *American Journal of Preventive Medicine*. 21, 110-117
- Mosavel, M., Simon, C., & VanStade, D., (2007). The mother-daughter relationship: What is its potential as a locus for health promotion? *Health Care for Women International*, 27, 646-664.
- Motl, R., Dishman, R., Saunders, R., Dowda, M., Felton, G. & Pate, R. (2001). Measuring enjoyment of physical activity in adolescent girls. *American Journal of Preventive Medicine*, 21(2), 110-117.
- National Conference of State Legislature. (2006). *Childhood obesity: legislative policy approaches and the evidence base to date*. Retrieved from <http://www.ncsl.org/IssuesResearch/Health/ChildhoodObesityLegislativePolicyApproaches/tabid/13933/Default.aspx>
- O'Connor, T. M., Jago, R., & Baranowski, T. (2009). Engaging parents to increase youth physical activity a systematic review. *Am J Prev Med*, 37(2), 141-149.
- Ogden, C., & Carroll, M. (2010). Prevalence of obesity among children and adolescents: United States, trends 1963-1965 through 2007-2008. Retrieved from www.cdc.gov/nchs
- Patterson, t., Semple, S., Fraga, M., Bucardo, J., Davila-Frager, W., & Strathdee, S. (2005). An HIV- prevention intervention for sex workers in Tijuana, Mexico: a pilot study. *Hispanic Journal of Behavioral Sciences*, 27(1), 82-100.
- Pender, N.J., Bar-Or, O., Wilk, B., & Mitchell, S. (2002). Self-efficacy and perceived exertion of girls during exercise. *Nursing Research*, 51(2), 86-91.

- Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2002). *Health Promotion in Nursing Practice* (4th ed.). Upper Saddle River, NJ: Prentice Hall.
- Pender, N. J., Murdaugh, C. L., & Parsons, M. (2006). *Health Promotion in Nursing Practice* (5th ed.). New Jersey: Pearson Prentice Hall.
- Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2011). *Health Promotion in Nursing Practice* (6th ed.). Boston, MA: Pearson.
- Pender, N.J. (2011). Health Promotion Manual. <http://deepblue.lib.umich>
- Perez, A, Fleury, J., & Keller, C. (2010). Review of intervention studies promoting physical activity in Hispanic women. *Western Journal of Nursing Research*, 32 (3), 341-362.
- Perez-Fortis, Diez, & Padilla (2012). Psychometric properties of the Spanish version of the Health-Promoting Lifestyle Profile II. *Research in Nursing and Health*, 35, 301-313.
- Plunkett, S. W., Henry, C.S., Robinson, L.C., Behnke, A., & Falcon, P. (2007). Adolescent perceptions of parental behaviors, adolescent self-esteem, and adolescent depressed mood. *Journal of Child & Family Studies*, 16, 760-772.
- Poag, K., & McAuley, E. (1992). Goal setting, self-efficacy, and exercise behavior. *Journal of Sport Exercise Psychology*, 14, 352-360.
- Polit, D., Beck, C., (2012). *Nursing Research: Generating and Assessing Evidence for Nursing Practice* (9th ed), Philadelphia,Pa.: Wolters Kluwer Lippincott Williams & Wilkins.

- Popkin, B., & Udry, R. (1998). Adolescent obesity increases significantly in second and third generation U.S. immigrants: The National longitudinal study of adolescent health. *Community and International Nutrition, 128*, 701-706.
- Reynolds, K.D., Kille, J.D., & Bryson, S.W. et al. (1990). Psychosocial predictors of physical activity in adolescents. *Preventive Medicine, 19*, 541-551.
- Ritchie, L.D., Welk, G., Styne, D., & Gerstein, D.E. (2005). Family environment and pediatric overweight: What is a parent to do? *Journal of the American Dietetic Association, 105* (5), S70-S79.
- Robbins, L.B., Pender, N.J., Ronis, D.L., Kazanis, A.S. & Pis, M.B. (2004). Physical activity, self efficacy, and perceived exertion among adolescents. *Research in Nursing and Health, 27*, 435-446.
- Robbins, L.B., Pis, M.B., Pender, N.J. & Kazanis, A.S. (2004). Exercise self-efficacy, enjoyment, and feeling states among adolescents. *Western Journal of Nursing Research 26*(7), 699-715.
- Portes, A., & Rumbaut, R. (2005). Introduction: The second generation and the children of Immigrants Longitudinal study. *Ethnic and Racial Studies 28*:6, 983-999.
- Ruiz, R., Gesell, S., Buchowski, M., Lambert, W., & Barkin, S. (2011). The relationship between Hispanic parents and their preschool-aged children's physical activity. *Pediatrics, 127*, 888- 895.
- Sallis, J.F., & Owen, N. (1999). Physical activity and behavioral medicine. Thousand Oaks, CA: Sage.

- Sallis, J., Pinski, R., Grossman, R., Patterson, T., & Nader P. (1988). The development of self-efficacy scales for health-related diet and exercise behaviors. *Health Education Research, 3*, 283-392.
- Samitz, G., Effer, M., Zwahlen, M. (2011). Domains of physical activity and all-cause mortality: systematic review and dose-response meta-analysis of cohort studies. *International Journal of Epidemiology, 40(1)*, 1382-1400.
- Sherer, M., Maddux, J. E., Mercadante, B. O., Prentice-Dunn, S., Jacobs, B., & Rogers, R. N. (1982). The self-efficacy scale: Construction and validation. *Psychological Reports, 51*, 663-671.
- Shin, Y., Jang, H., and Pender, N. (2001). Psychometric evaluation of the exercise self-efficacy scale among Korean adults with chronic diseases. *Research in Nursing and Health, 24*, 68-76
- Shin, Y.H., Yun, S.K., Pender, N., & Jang, H.J. (2005). Test of the Health Promotion Model as a Causal Model of commitment to a plan for exercise among Korean adults with chronic disease. *Research in Nursing and Health, 28*, 117-125.
- Singh, G., Yu, S., Siahpush, M., & Kogan, M. (2008). High levels of physical inactivity and sedentary behaviors among US immigrant children and adolescents. *Arch Pediatric Adolescent Medicine, 162(8)*, 756-763.
- Smokowski, P. R., & Bacallao, M. L. (2006). Acculturation and aggression in Latino adolescents: A structural model focusing on cultural risk factors and assets. *Journal of Abnormal Child Psychology 34*, 659-673.
- Srof, B.J., & Velsor-Friedrich, B. (2006). Health promotion in adolescents: A review of Pender's Health Promotion Model. *Nursing Science Quarterly, 19*, 336-373.

- Stucky-Ropp, R. & DiLorenzo, T. (1993). Determinants of exercise in children. *Preventive Medicine*, 22, 880-889.
- Taningco, M. (2007). Revisiting the Latina health paradox. The Tomas Rivera Policy Institute, Los Angeles, CA.
- Taymoori, P., Lubans, D., & Berry, T. (2010). Evaluation of the Health Promotion Model to predict physical activity in Iranian adolescent boys. *Health Education Behavior*, 37 (84), 84-96.
- Thomas, J., Nelson, J., & Silverman, S. (2011). Research methods in physical activity. 6th edition Champaign, IL: Human Kinetics.
- Tortolero, S., Masse, L., Fulton, J., Torres, I., Kohl, H (1999). Assessing physical activity among minority women: focus group results. *Women's Health Issues* 9 (3), 135-142.
- Trost, S.G., Owen, N., Bauman, A.E., Sallis, J.F., & Brown, W. (2002). Correlates of adults' participation in physical activity: review and update. *Medical Science Sport Exercise* 34(12): 1996-2001.
- Trost, SG, McIver, KL, & Pate, RR. (2005). Conducting accelerometer-based activity assessments in field-based research. *Medicine & Science in Sports & Exercise*. 37, s531-s543
- Trost, SG, Ward, DS, Moorehead, SM, Watson, PD, Riner, W., & Burke, JR. (1998). Validity of the computer science and applications (CSA) activity monitor in children. *Medicine & Science in Sports and Exercise*, 30, 629-633.
- United States Department of Health and Human Services. *HHS Action plan to reduce racial and ethnic disparities: A nation free of disparities in health and health*

- care*. Washington, D.C: U.S. Department of Health and Human Services, [April 2011]
- U.S. Department of Health and Human Services. *Physical Activity Guidelines for Americans. Be Active, Healthy, and Happy*. Washington, D.C., USA, 2008
- U.S. Department of Health and Human Services Office of Minority Health. (2008). <http://minorityhealth.hhs.gov>.
- U.S. Census (September 18, 2012). <http://quickfacts.census.gov>
- VanHook, Baker, Altman, & Frisco (2011). Canaries in a coalmine: Immigration and overweight among Mexican-origin children in the US and Mexico. *Social Science & Medicine*, 74, 125-134
- Vorhees, C. C., & Young, D. R. (2003). Personal, social, and physical environmental correlates of physical activity levels in urban Latinas. *American Journal of Preventive Medicine*, 25(3Si), 61-68.
- Walker, S.N., & Hill-Polerecky, D.M. (1996). Psychometric evaluation of the Health-Promoting Lifestyle Profile II. Unpublished manuscript, University of Nebraska Medical Center.
- Walker, S.N., Sechrist, K.R., & Pender, N.J. (1987). The health-promoting lifestyle profile: Development and psychometric characteristics. *Nursing Research*, 36(2), 76-80.
- Wang, H-H. (1999). Predictors of health promotion lifestyle among three ethnic groups of elderly rural women in Taiwan. *Public Health Nursing*, 16(5), 321-327.

- Wang, Y., Beydoun, M.A., Liang, L., Caballero, B., & Kumanyika, S.K. (2008). Will all Americans become overweight or obese? Estimating the progression and cost of the U.S. obesity epidemic. *Obesity, 16*, 2323-2330.
- Wieland, M., Weis, J., Palmer, T., Goodson, M., Loth, S., Omer, F., Abbenyi, A., Krucker, K., Edens, K., & Sia, I. (2012). Physical activity and nutrition among immigrant and refugee women: A community-based participatory research approach. *Women's Health Issues, 22*(2), e225-e232
DOI:10.1016/j.whi.2011.10.002.
- Woodcock, J., Franco, O., Orsini, N., & Roberts, I. (2011). Non-vigorous physical activity and all-cause mortality: systematic review and meta-analysis of cohort studies. *International Journal of Epidemiology, 40*(1), 121-138
- Wu, T-Y, & Pender, N. (2002). Determinants of physical activity among Taiwanese adolescents: An application of the Health Promotion Model. *Research in Nursing and Health, 25*, 25-36.
- Wu, T-Y, & Pender, N. (2005). A panel study of physical activity in Taiwanese youth: Testing the revised Health-Promotion Model. *Family Community Health, 28*(2), 113-124.
- Yang, K., Laffrey, S., Stuifbergen, A., Im, E-O, May, K. & Kouzekanani, K. (2007). Leisure-time physical activity among midlife Korean immigrant women in the US. *Journal of Immigrant Minority Health, 9*, 291-298.
- Zakarian, J.M., Hovell, M.F., Hofstetter, C.R., Sallis, J.F., & Keating, K.J. (1994). Correlates of vigorous exercise in a predominantly low SES and minority high school population. *Preventive Medicine, 23*(3), 314-32.

Announcement

Appendix A



Announcement



Appendix B

Parental INFORMED CONSENT**“Factors affecting commitment to a plan of physical activity among low income Hispanic girls and their mothers”**

Your daughter is invited to participate in a research study that is being conducted by Suzanne M. Keep PhD (c), RN, who is a doctoral student in the Nursing Department at Rutgers University.

The purpose of this research is to determine, **“Factors affecting commitment to a plan of physical activity among low income Hispanic girls and their mothers”**

Approximately 200 subjects between the ages of 8 and 12 for the adolescent, and the mother, older than 18 years old, will participate in the study, and each individual's participation will last approximately 20-30 minutes.

The study procedures include completing surveys, height and weight measurement, and wearing an actigraph that measures physical activity, for 3 days.

Participation in this study will involve the following:

- Completion of a questionnaire and surveys that are designed to learn more about your daughter's physical activity. Your daughter will be asked to complete the surveys. People from the church will be available if your daughter needs help
- Your daughter will first be asked to complete a couple of brief questionnaires about her age, level of education, number of hours of sleep she gets, and her ethnicity. I will then measure your daughter's height and weight
- Next, your daughter will be asked to complete four brief questionnaires about her physical activity, what her belief is about how much others think she should exercise, how confident your daughter feels about exercising, how she feels when she exercises, and her level of planning for commitment for physical activity.
- The final phase will be for your daughter to wear an accelerometer (which is a small device that is worn on a belt around your waist that will measure your physical activity), for three days.
- After she has worn the accelerometer for three days, please return the accelerometer to the church office, and she will receive a \$20.00 gift card to Meijer.

This research is confidential. The research records will include some information about your daughter and this information will be stored in such a manner that some linkage between her identity and the response in the research exists. Some of the information collected about your daughter includes keeping her name and phone number in a locked cabinet so that I may reach your daughter in case she forgot to turn in her accelerometer. Please note that we will keep this information confidential by limiting individual's access to the research data and keeping it in a secure location, in a locked cabinet in a locked room at Aquinas College.

The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see the data, 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 data will be kept for three years.

There are no foreseeable risks to participation in this study, however if your daughter feels uncomfortable about anything and needs to talk to someone you may contact Network 180 Community Mental Health, 790 Fuller Ave NE, Grand Rapids, MI 49503, 616-336-3909.

Your daughter will be told that the benefits of taking part in this study may be that she thinks about her health and think more about physical activity. However, she may receive no direct

benefit from taking part in this study. Your daughter will receive a 20-dollar Meijer gift card for completing the entire study.

Code # _____

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

If you have any questions about the study or study procedures, you may contact myself at Aquinas College, 1607 Robinson Rd., Grand Rapids, MI 49006, 616-632-2823.

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

Rutgers University, the State University of New Jersey
Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs
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 consent form for your records.

Sign below if you agree for your daughter to participate in this research study:

Daughter's name (Print) _____

Parent's name (Print) _____

Parent's Signature _____ Date _____

Principal Investigator Signature _____ Date _____

código# _____

La Patria Potestad Consentimiento Informado

“Factores que Afectan el Compromiso a Seguir un Plan de Actividad Física Entre Madres e Hijas Hispanas de Bajos Ingresos”

Su hija está invitada a ser parte de una investigación que será conducida por Suzanne M. Keep Ph.D (c), RN, quien es una estudiante doctoral en el Departamento de Enfermería en Rutgers University. El propósito de esta investigación es determinar, “Factores que Afectan el Compromiso a Seguir un Plan de Actividad Física Entre Madres e Hijas Hispanas de Bajos Ingresos”

Aproximadamente 200 sujetos entre las edades de 8 a 12 años de edad para las adolescentes, y mayores de 18 años para las madres, participaran en esta investigación y la participación de cada individuo durara aproximadamente 20-30 minutos.

Los procedimientos de esta investigación incluyen completar encuestas, medidas de estatura y peso, y el traer puesto en la cintura un acelerómetro que mide la actividad física de la participante por tres días.

:

Participación en esta investigación incluirá lo siguiente:

- Completar un cuestionario y encuestas diseñadas para aprender más sobre su actividad física. A su hija se le preguntara que complete las encuestas sin la ayuda de usted. Gente de la iglesia estará disponible por si ella ocupa ayuda
- Primeramente a su hija se le preguntara que complete unos breves cuestionarios sobre su edad, nivel de educación, número de horas que usted completa al dormir, y su raza
- Luego, su hija completara unos cuestionarios cortos sobre su actividad física, lo que usted piensa sobre lo que otras personas consideran un ejercicio apropiado, que tan confidente se siente ella sobre el hacer ejercicio, como se siente cuando hace ejercicio, y cuanto ella planea para comprometerse a llevar y hacer actividades físicas
- La última fase será ponerle a su hija un acelerómetro (un aparato que se coloca alrededor de su cintura que mide su actividad física) por 3 días
- Después de los tres días, por favor regrese el acelerómetro a la oficina de la iglesia y recibirá una tarjeta de regalo de \$20 para Meijer.

Esta investigación es completamente confidencial. Los archivos de la investigación incluyeran información sobre su hija y esta será guardada para que su identidad y lo que se aprenda de la investigación serán secretos. Información de su hija, como su nombre y número de teléfono serán guardados con llave para que yo pueda comunicarme con ella en caso de que olvide regresar el acelerómetro. Por favor note que esta información será confidencial y se limitara el acceso a esta, será guardada en una locación segura y con candado en un cuarto de Aquinas College.

El equipo de investigación y el Institutional Review Board at Rutgers University (un comité que revisa estudios de investigación como este para proteger a los participantes como usted) serán los únicos con derechos a ver los datos de esta investigación, excepto en casos que sean requeridos por la ley. Si algún reporte de esta investigación es publicado, o los resultados

presentados a una conferencia de profesionales, solo resultados en grupo serán presentados. Información sobre participantes individuales no será relatada. Los datos que se acumulen de esta investigación serán conservados por tres años.

No hay riesgos en participar en esta investigación, sin embargo si su hija se siente incómoda sobre algo y necesita hablar con alguien puede contactar a Network 180 Community Mental Health, 790 Fuller Ave NE, Grand Rapids, MI 49503, 616-336-3909.

ID# _____

Se le dirá a su hija que algunos beneficios que vienen por ser parte de esta investigación son el que ella esté más consciente de su salud y actividad física. Sin embargo, puede que ella no reciba algún

beneficio directo en la participación de esta investigación. Su hija recibirá una tarjeta de regalo de Meijer con el valor de \$20 al completar la investigación.

La participación en esta investigación es completamente voluntaria. Su hija guarda el derecho de no participar, y puede salirse de la investigación cuando usted o su hija desean sin algún castigo. También su hija tiene el derecho de no contestar cualquier pregunta que le incomode.

Si su hija o usted tienen alguna pregunta sobre la investigación o los procedimientos, pueden contactarme a Aquinas College, 1607 Robinson Rd., Grand Rapids, MI 49006, 616-632-2823.

Si usted tiene algunas preguntas sobre los derechos de su hija como participante de investigación, puede contactar al Administrador de IRB en Rutgers University:

Rutgers University, the State University of New Jersey
Institutional Review Board for the Protection of Human Subjects
Office of Research and Sponsored Programs
3 Rutgers Plaza
New Brunswick, NJ 08901-8559
Tel: 848-932-0150
(Correo electrónico): humansubjects@orsp.rutgers.edu

Se le dará una copia de este formulario para sus archivos.

Firme abajo si usted consiente participar en esta investigación de estudio:

Hija Participante (Imprima)

Nombre de Padre/Madre (Imprima)

Fecha

Firma de Padre/Madre

Fecha

Firma de Investigador Principal

Fecha

ID# _____

Code #

ASSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES

Investigator: Suzanne M. Keep PhD(c), RN
Rutgers University

Study Title: **“Factors affecting commitment to a plan of physical activity among low income Hispanic girls and their mothers”**

This assent form may contain words that you do not understand. Please ask the researcher or your parent to explain any words or information that you do not clearly understand before signing this document.

1. Ms. Suzanne M. Keep is inviting you to take part in her research study. Why is this study being done?

I want to find out about physical activity among Hispanic mothers and daughters and understand what mothers and daughters think about exercise such as what you think others think about your physical activity, how you feel when you exercise, and what plan or commitment do you have for exercise. Between 90 and 100 adolescent daughters, and between 90-100 mothers of adolescents will be a part of this study. The girls will be from the ages of 8 to 12, and the mom's will be over 18 years old.

2. What will happen:

First you will complete some surveys about physical activity, what your belief about how much others think you should exercise, how sure you are that you can exercise, how you feel when you exercise and your commitment for a plan to exercise. The surveys will last about 20-30 minutes. For these surveys, you will choose the best answer that is right for you. Then, I will give you an accelerometer (a small device that goes around your waist and will measure your physical activity) to wear for three days. When you are done wearing the accelerometer, I would like you to give it to your mom to bring back to the church office.

3. What does it cost and how much does it pay?

You don't pay to take part in this study. I will give you a 20-dollar Meijer gift card when you return the accelerometer to the church office.

4. There are very few risks in taking part in this research, but the following things could happen:

Probably: Nothing bad would happen.

Very unusual: You could be upset or embarrassed by a few of the questions. If this should occur, remember that you don't have to answer any questions you don't want to and either you or a member of the research team may choose to stop the project.

Resource information has been given to your parent if you should need counseling:

Network 180 Community Mental Health, 790 Fuller Avenue NE, Grand Rapids, MI 49503, 616-336-3909.

5. Are there any benefits that you or others will get out of being in this study?

All research must have some potential benefit either directly to those that take part in it or potentially to others through the knowledge gained. The only direct benefit to you may be that you may think about your health and how you might be more physically active. The knowledge gained through this study may allow me to develop more effective programs to assist persons who need help to be more physically active.

It's completely up to you! Both you and your parents have to agree to allow you to take part in this study. If you choose to not take part in this study, we will honor that choice. No one will get angry or upset with you if you don't want to do this. If you agree to take part in it and then you change your mind later, that's OK too. It's always your choice!

6. CONFIDENTIALITY: I will do everything I can to protect the confidentiality of your records. If I write professional articles about this research, I will never say your name or anything that could give away who you are. I will do a good job at keeping our entire records secret by following the rules made for researchers.

7. Do you have any questions? If you have any questions or worries regarding this study, or if any problems come up, you may call the principal investigator Ms. Keep at: Aquinas College 1607 Robinson Road, Grand Rapids, MI, 49506. Phone 616-632-2823.

You may also ask questions or talk about any worries to the Institutional Review Board (a committee that reviews research studies in order to protect those who participate). Please contact the IRB Administrator at Rutgers University at:

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

Your parent or guardian will also be asked if they wish for you to participate in this study. You will be given a copy of this form for your records.

Please sign below if you assent (that means you agree) to participate in this study.

Signature Date

Name (Please print): _____

Investigator's Signature: _____ Date: _____

código# _____

CONSENTIMIENTO PARA PARTICIPACIÓN EN ACTIVIDADES DE
INVESTIGACIÓN

Investigator: Suzanne M. Keep PhD(c), RN
Rutgers University

Study Title: "Factores que Afectan el Compromiso a Seguir un Plan de Actividad Física
Entre Madres e Hijas Hispanas de Bajos Ingresos"

Esta forma de consentimiento puede que contenga palabras que usted no entienda. Por favor pregúntele al investigador o a sus padres que le expliquen estas palabras o cualquier información que usted no comprenda claramente antes de firmar este documento.

1. La Señora Suzanne M. Keep la está invitando a que usted forme parte de su investigación. Cuál es el motivo de esta investigación?

Me gustaría aprender más sobre la actividad física entre madres e hijas Hispanas y entender lo que madres e hijas piensan sobre el ejercicio como también aprender lo que otros piensan sobre el ejercicio de ustedes, como se sienten cuando hacen ejercicio, y también que plan o compromiso formulan ustedes para hacer ejercicio. Entre 90 a 100 hijas adolescentes, y entre 90 a 100 madres de las adolescentes serán parte de esta investigación. Las niñas tendrán edades entre los 8 y 12 años, and las madres serán mayores de 18 años de edad.

2. Que pasara:

Primeramente usted completara unas encuestas sobre la actividad física, que piensa usted sobre lo que otras personas consideran la cantidad adecuada de ejercicio, que segura está usted que pueda hacer ejercicio, como se siente cuando hace ejercicio y su compromiso para planear hacer ejercicio. Las encuestas duraran de 20-30 minutos. Para estas encuestas, usted elegirá la respuesta que es la más correcta para usted. Luego, yo le daré un acelerómetro (un aparato que se coloca alrededor de su cintura que mide su actividad física) que usted traerá durante 3 días. Cuando termine, por favor regrese el acelerómetro a la oficina de la iglesia.

3. Cuánto cuesta y cuando se nos pagara?

Usted no tiene que pagar para ser parte de esta investigación. Yo le daré una target de regalo de \$20 para la tienda Meijer cuando usted regrese su acelerómetro a la oficina de la iglesia.

4. No hay muchos riesgos en ser parte de esta investigación, pero las siguientes cosas pueden suceder:

Probablemente: Nada malo sucederá.

No Muy Probable: Es probable que usted se sorprenda o le dé pena con algunas de las preguntas que se le darán. Si esto ocurre, recuerde que usted no tiene que contestar preguntas que le incomoden y usted o algún miembro de esta investigación pueden detener el proyecto. Información de recursos se le ha dado a su madre si usted necesita apoyo: Network 180 Community Mental Health, 790 Fuller Avenue NE, Grand Rapids, MI 49053, 616-336-3909.

5. Hay beneficios que usted o otros recibirán por ser parte de esta investigación?

Todas las investigaciones tienen el potencial de beneficiar a los que participan directamente o indirectamente a otros con el conocimiento que se dé a conocer durante el experimento. El único beneficio directo para usted es el que usted empiece a considerar su salud mejor y pensar en cómo usted puede ser más activa físicamente.

Es totalmente su decisión! Ambos usted y sus padres tienen que estar de acuerdo en dejar que sea parte de esta investigación. Si usted elige no ser parte de esta investigación, nosotros respetaremos esa decisión. Nadie tomara su decisión personalmente y nadie se enojara. Si usted está de acuerdo en ser parte y luego cambia de decisión, esto es totalmente aceptable también. Siempre es su decisión la que se tomará en cuenta!

CONFIDENCIAL: Yo hare todo lo que pueda para proteger sus records de una manera confidencial. Si escribo artículos y papeles profesionales sobre esta encuesta, nunca escribiré o daré su nombre o información sobre quién es usted. Protegeré y guardare los archivos de su información en secreto, siguiendo las reglas hechas para los investigadores en estas situaciones.

6. Tiene algunas preguntas? Si usted tiene preguntas o preocupaciones sobre esta investigación, por favor llame a la investigadora principal, Ms. Keep al: Aquinas College 1607 Robinson Road, Grand Rapids, MI, 49506. Teléfono 616-632-2823.

Usted también tiene el derecho de hacer preguntas o platicar sobre cualquier preocupación que tenga con el Institutional Review Board (un comité que revisa estudios de investigación como este para proteger a los participantes como usted). Por favor contacte el Administrador de IRB en Rutgers University:

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

ID# _____

A su padre o guardián también se le preguntara si ellos desean que usted sea parte de esta investigación. A usted de le dará una copia de este formulario para sus archivos.

Favor de firmar abajo si usted consiente (está de acuerdo) participar en esta investigación.

Firma

Fecha

Nombre (Imprima)

Firma de Investigador

Fech

Appendix C

Code# _____

Demographic Form**Please put an X in the box that best answers the question for you.****Please fill in the blank lines as necessary.**

1. Person completing this form:

	1	Mother
	2	Daughter

2. Number of children (if no children, go to next question)

	0	0
	1	1
	2	2
	3	3
	4	4
	5	5
	6	6 or more

3. Age

What is your birth date (please include month date, and year)?

_____ Age _____

4. Marital Status (Please check the one that applies to you)

	1	Single
	2	Married
	3	Separated
	4	Divorced

5. What is the highest degree or level of school you have completed? If currently enrolled, mark the previous grade or highest degree received. (Please check the one that applies to you)

	1	No schooling completed
	2	Nursery School to 8 th grade
	3	9 th ,10 th ,or 11th grade
	4	12 th grade, no diploma (did not graduate)
	5	High School graduate, or GED (high school equivalent)
	6	Some college credit, less than a year
	7	1 or more years of college, no degree
	8	Associate degree
	9	Bachelor's degree
	10	Master's degree
	11	Professional Degree like a dentist or lawyer
	12	Doctorate degree (for example PhD, EdD)

6. Please specify your race.

	1	Hispanic or Latino
	2	Not Hispanic

7. Are you currently working?

(Please check the one that applies to you)

<input type="checkbox"/>	1	employed by someone or a company
<input type="checkbox"/>	2	Self-employed
<input type="checkbox"/>	3	Out of work and looking for work
<input type="checkbox"/>	4	Out of work but not currently looking for work
<input type="checkbox"/>	5	A homemaker
<input type="checkbox"/>	6	A student – if yes, Current Grade _____
<input type="checkbox"/>	7	Retired
<input type="checkbox"/>	8	Unable to work
<input type="checkbox"/>	9	Other (please explain)

8. What is your total household income? (Please check the one that applies to you)

<input type="checkbox"/>	1	Less than \$10,000
<input type="checkbox"/>	2	\$10,000 to \$40,000
<input type="checkbox"/>	3	\$40,000 to \$70,000
<input type="checkbox"/>	4	over \$70,000

Demographic form in Spanish**Codigo#**_____**Forma del demográfico. Madres e hijas favor de completar:****Favor de poner "X" en la caja que sea la más apropiada a usted.****Favor de llenar las líneas vacías como sea necesario.**

1. Persona completando esta forma:

	1	Madre
	2	Hija

2. Número de hijos en total (favor de seguir a la pregunta siguiente si no tiene hijos)

	0	0
	1	1
	2	2
	3	3
	4	4
	5	5
	6	6 o mas

3. Edad

Cuál es su fecha de nacimiento (favor de incluir mes y año)?

_____ Edad _____

4. Estado matrimonial

	1	Soltera
	2	Casada
	3	Separada
	4	Divorciada

5.Cuál es el nivel de educación más alto que usted a completado?

Favor de indicar nivel más alto: _____

6. Favor de indicar su raza

	1	Hispano, caucásico (blanco)
	2	Hispano, Negro-Africano
	3	Hispano, mesclado

7. Presentemente, está usted trabajando fuera de casa?

(Favor de indicar el que le favorezca mas)

	1	empleado/a por alguien o una compañía (indique cuantas horas a la semana)#_____
	2	Empleada por migo-misma (horas)#_____
	3	Desempleada y buscando trabajo
	4	Desempleada pero no estoy buscando trabajo
	5	Ama de casa
	6	Estudiante- nivel: _____
	7	Retirada
	8	No puedo trabajar
	9	Otra razón: favor de explicar

8. Cuál es el ingreso total por hogar anual

	1	Menos de \$10,000
	2	\$10,000 to (a) \$40,000
	3	\$40,000 to \$70,000
	4	sobre \$70,000
	5	No tengo esta información a mano

9. Cuantos años a vivido en los Estados Unidos? _____

Appendix D

Short Acculturation Scale for Hispanics English Version **Code#** _____

1. In general, what language do you read and speak?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Only Spanish	Spanish better than English	Both Equally	English better than Spanish	Only English

2. What was the language(s) you used as a child?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Only Spanish	Spanish better than English	Both Equally	English better than Spanish	Only English

3. What language(s) do you usually speak at home?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Only Spanish	Spanish better than English	Both Equally	English better than Spanish	Only English

4. In which language(s) do you usually think?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Only Spanish	Spanish better than English	Both Equally	English better than Spanish	Only English

5. What language(s) do you usually speak with your friends?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Only Spanish	Spanish better than English	Both Equally	English better than Spanish	Only English

Appendix D (continued)

6. In what language(s) are the T.V. programs you usually watch?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Only Spanish	Spanish better than English	Both Equally	English better than Spanish	Only English

7. In what language(s) are the radio programs you usually listen to?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Only Spanish	Spanish better than English	Both Equally	English better than Spanish	Only English

8. In general, in what language(s) are the movies, T.V. and radio programs you *prefer* to watch and listen to?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Only Spanish	Spanish better than English	Both Equally	English better than Spanish	Only English

9. Your close friends are:

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
All Latinos/ Hispanics	More Latinos than Americans	About Half & Half	More Americans than Latinos	All Americans

10. You prefer going to social gatherings/parties at which the people are:

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
All Latinos/ Hispanics	More Latinos than Americans	About Half & Half	More Americans than Latinos	All Americans

11. The persons you visit, or who visit you are:

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
All Latinos/ Hispanics	More Latinos than Americans	About Half & Half	More Americans than Latinos	All Americans

12. If you could choose your children's friends, you would want them to be:

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
All Latinos/ Hispanics	More Latinos than Americans	About Half & Half	More Americans than Latinos	All Americans

A. Spanish

1. Por lo general, que idioma(s) lee y habla usted?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Solo Español	Español mejor que Inglés	Ambos por igual	Inglés mejor que Español	Solo Inglés

2. Cual fué el idioma(s) que hablo cuando era niño(a)?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Solo Español	Más Español qué Inglés	Ambos por igual	Más Inglés que Español	Solo Inglés

3. Por lo general, en que idioma(s) habla en su casa?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Solo Español	Más Español qué Inglés	Ambos por igual	Más Inglés que Español	Solo Inglés

4. Por lo general, en que idioma(s) piensa?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Solo Español	Más Español qué Inglés	Ambos por igual	Más Inglés que Español	Solo Inglés

5. Por lo general, en que idioma(s) habla con sus amigos(as)?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Solo Español	Más Español qué Inglés	Ambos por igual	Más Inglés qué Español	Solo Inglés

6. Por lo general, en que idioma(s) son los programas de televisión que usted ve?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Solo Español	Más Español qué Inglés	Ambos por igual	Más Inglés qué Español	Solo Inglés

7. Por lo general, en que idioma(s) programas de radio que usted escucha?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Solo Español	Más Español qué Inglés	Ambos por igual	Más Inglés qué Español	Solo Inglés

8. Por lo general, en que idioma(s) *prefiere* oír y ver películas, y programas de radio y televisión?

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Solo Español	Más Español qué Inglés	Ambos por igual	Más Inglés qué Español	Solo Inglés

9. Sus amigos y amigas mas cercanos son:

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Solo Latinos	Más Latinos qué Americanos	Casi mitad y mitad	Más Americanos qué Latinos	Solo Americanos

10. Usted prefiere ir a reuniones sociales/fiestas en las cuales las personas con:

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :

Solo	Más	Casi mitad	Más	Solo
Latinos	Latinos qué	y mitad	Americanos	Americanos
	Americanos		qué Latinos	

11. Las personas qué usted visita o qué le visitan son:

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Solo	Más	Casi mitad	Más	Solo
Latinos	Latinos qué	y mitad	Americanos	Americanos
	Americanos		qué Latinos	

12. Si usted pudiera escoger los amigos (as) de sus hijos (as), quisiera qué ellos (as) fueran:

1	2	3	4	5
: _____ :	: _____ :	: _____ :	: _____ :	: _____ :
Solo	Más	Casi mitad	Más	Solo
Latinos	Latinos qué	y mitad	Americanos	Americanos
	Americanos		qué Latinos	

Marin, G., Sabogal, F., VanOss, B., Otero-Sabogal, R., and Perez-Stable, E. (1987). Development of a short acculturation scale for Hispanics. *Hispanic Journal of Behavioral Sciences*, 9(2), 183-205

Appendix E

Anthropometric form**Code#** _____

Height in inches	
Weight in kilograms	
Actigraph number	

Medidas de Madre e Hija Codigo#_____

Altura en Pulgadas	
Peso en Libras	
Índice de masa corporal	
Numero de Actigraph	


Appendix F

Physical Activity Record (PAR)**Code#** _____

Which best describes your level of physical activity?	¿Cuál describe mejor su nivel de la actividad física?
I. Does not participate in programmed recreation, sport or physical activity	I. No tome parte en la recreación programada, el deporte ni la actividad física
0 Avoids walking or exercise (for example always uses elevators, drives whenever possible instead of walking)	0 Evita andar o ejercicio (por ejemplo siempre utiliza elevadores, manejan siempre que posible en vez de andar)
1 Walks for pleasure, routinely uses stairs, occasionally exercises sufficiently to cause heavy breathing or perspiration	1 Las caminatas para el placer, utilizan la escalera rutinariamente, ocasionalmente ejercitan suficientemente para causar respirar pesados o sudor
II. Participates regularly in recreation or work requiring modest physical activity (such as golf, horseback riding, gymnastics, bowling, weight lifting or yard work)	II. Participa regularmente en la recreación o el trabajo que requieren la actividad física modesta (tal como el golf, la equitación, la gimnasia, el lanzamiento, el peso que levanta o el trabajo de yarda)
2 10-60- minutes per week	2 10-60- minutos a la semana
3 Over 1 hour per week	3 Mas que una hora a la semana
III. Participates regularly in heavy physical exercise (such as running or jogging, swimming, cycling, rowing, skipping rope, running in place) or engages in vigorous aerobic type activity (such as tennis or basketball)	Participa regularmente en ejercicio físico pesado (tal como corriendo o para correr, la natación, remar, saltar a la comba, corriendo en el lugar) o entra en un tipo de la actividad aeróbica vigorosa (tal como el tenis o el baloncesto)
4 Runs less than 1 mile per week or spends less than 30 minutes per week in comparable physical activity	4 Corren menos de 1 milla a la semana o pasan menos de 30 minutos a la semana en actividad física comparable
5 Runs 1-5 miles per week or spends 30-60 minutes per week in comparable physical activity	5 Corren 1-5 millas a la semana o pasan 30-60 minutos a la semana en actividad física comparable
6 Runs 5-10 miles per week or spends 1-3 hours per week in comparable physical activity	6 Corren 5-10 millas a la semana o pasan 1-3 horas a la semana en actividad comparable
7 Runs more than 10 miles per week or spends more than 3 hours per week in comparable physical activity	7 Corre más de 10 millas a la semana o pasa más de 3 horas a la semana en actividad físico comparable

Appendix G

Declaration of Conformity for GT3X+

DECLARATION OF CONFORMITY	
IN ACCORDANCE TO ISO/IEC GUIDE 22	
FOR	
<i>Activity Monitors</i>	
MANUFACTURER:	ActiGraph 49 East Chase Street Pensacola, Florida 32502 Phone: 850-332-7900 Fax: 850-332-7904
MODEL NUMBER:	GT3X+, ActiSleep
REPORT #:	F2LQ4078-01E F2LQ4078-02S
DIRECTIVES:	Medical Devices Directive 93/42/EEC Electromagnetic Compatibility Directive 2004/108/EC
STANDARDS:	<ul style="list-style-type: none">- <i>Medical Electrical Equipment Part 1: General Requirements for Safety</i> <i>IEC 60601-1:1988+A1:1991+A2:1995</i>- <i>Medical Electrical Equipment Part 1-2: General Requirements for Basic Safety and Essential Performance – Collateral Standard: Electromagnetic Compatibility – Requirements and Tests</i> EN 60601-1-2:2007- <i>Electromagnetic Compatibility-Part 4: Testing and Measurement Techniques – Section 2: Electrostatic Discharge Immunity Test</i> EN 61000-4-2:1995- <i>Electromagnetic Compatibility-Part 4: Testing and Measurement Techniques – Section 3: Radiated, Radio-Frequency, Electromagnetic Field Immunity Test</i> EN 61000-4-3:1996- <i>Limits and Methods of Measurement of Radio Disturbance, Characteristics of Industrial, Scientific and Medical Radio Frequency Equipment</i> EN 55011:2007
TESTING FACILITIES:	<i>F-Squared Laboratories</i> 26501 Ridge Road Damascus, Maryland 20745 USA <i>F-Squared Laboratories</i> 16740 Peters Road Middlefield, Ohio 44062 USA
The Activity Monitors, GT3X+ and ActiSleep, are in effective conformance to the Directives and Standards referenced above.	
Authorized by:	
Date:	October 27, 2011
Name:	Adam Simon
Title:	Quality Manager

Appendix H

LIFESTYLE PROFILE II English Version Adult**Code#** _____

DIRECTIONS: This questionnaire contains statements about your *present* way of life or personal habits.

Please respond to each item as accurately as possible, and try not to skip any item. Please place a check [X] in the box that answers the question best for you.

	Never	Sometimes	Often	Routinely
1. Follow a planned exercise program				
2. Exercise vigorously (breathing hard) for 20 or more minutes at least three times a week such as walking fast, riding a bike fast, aerobic dancing, or using a stair climber				
3. Taking part in light to moderate physical activity (such as walking 30-40 minutes 5 or more times a week)				
4. Take part in recreational physical activities such as swimming, dancing or biking.				
5. Do Stretching exercises at least 3 times per week.				
6. Get exercise during usual daily activities like walking during lunch, taking stairs instead of the elevator, parking car away from destination and walking.				
7. Check my pulse rate when exercising				
8. Reach my target heart rate when exercising				

Cuestionario Del Estilos De Vida II Spanish Version**Code#** _____

INSTRUCCIONES: Este cuestionario contiene declaraciones sobre su actual forma de vida o hábitos personales.

Por favor, responda a cada elemento con la mayor precisión posible, y tratar de no omitir ningún elemento. Por favor, marque [✓] en el cuadro que responde a la pregunta mejor para usted.

	N = nunca	A = algunas veces	M = frecuentem ente	R = rutinariament e
1. Sigo un programa de ejercicios planificados.				
2. Hago ejercicios vigorosos por 20 o más minutos, por lo menos tres veces a la semana tales y como caminar rápidamente, andar en bicicleta, baile aeróbico, usar la maquina escaladora).				
3. Tomo parte en actividades fisicas livianas a moderadas (tales como carminar continuamente de 30 a 40 minutos, 5 o mas veces a la semana				
4. Tomo parte en actividades físicas de recreación (tales como nadar, bailar, andar en bicicleta).				
5. Hago ejercicios para estirar los músculos por lo menos 3 veces por semana				
6. Hago ejercicios durante actividades fisicas usuales diariamente (tales como caminar a la hora del almuerzo, utilizar escaleras en vez de elevadores, estacionar el carro lejos del lugar de destino y, caminar).				
7. Tomo mi pulso mientras que estoy hacienda ejercicios				
8. Alcanzo mi pulso objetivo				

cuando hago ejercicios.				
-------------------------	--	--	--	--

ADOLESCENT LIFESTYLE QUESTIONNAIRE

Code _____

Welcome to a survey about YOU! There are no right or wrong answers! Please place a check in the box where the answer that is honest for you. No one else will ever know how you answered.

1= NEVER, 2= RARELY, 3= SOMETIMES, 4= OFTEN, 5= ALMOST ALWAYS

	1= Never	2 =Rarely	3= Sometimes	4= Often	5= Almost Always
1. In an average week, I exercise 3-4 times such as running, taking long walks, dancing, playing ball, swimming.					
2. I participate (take part) in a regular program of sports/exercise at school.					
3. I exercise vigorously (really hard) for 20-30 minutes at least 3 times per week.					
4. I play sports at least 3 times per week.					

¡ Bienvenido a una encuesta sobre usted! No existen respuestas correctas o incorrectas! Por favor, marque la casilla donde la respuesta que es honesto para usted. Nadie sabrá nunca cómo ha respondido.

1 NO = NUNCA 2 = RARA VEZ 3 = A VECES, 4 = A MENUDO, 5 = CASI SIEMPRE

	1 = Nunca	2 = Rara vez	3 = A veces	4 = A menudo	5 = Casi siempre
1. En una semana promedio, hago ejercicio 3-4 veces como correr, tardando caminatas, bailar, jugar a la pelota, natación.					
2. Participar en un programa regular de deportes y ejercicio en la escuela.					
3. Hago ejercicio vigorosamente (muy difícil) para 20-30 minutos por lo menos 3 veces por semana.					
4. Practicar deportes por lo menos 3 veces por semana.					

Appendix I

Exercise Norms Scale**Code#** _____

How much do you think the following people expect you to exercise (be active to the point that you sweat, breathe fast, or your heart beats fast)? Place a check (✓) in the box for your answer.

J1. Family members	Not at all	Sort of	A lot
J2. My closest friend	Not at all	Sort of	A lot
J3. 5 or 6 friends I spend most of my time with	Not at all	Sort of	A lot
J4. The teacher I am closest to	Not at all	Sort of	A lot
J5. My doctor	Not at all	Sort of	A lot

Scoring Instructions for the Exercise Norms Scale

In scoring:

J1 to J5 0 = Not at all 1 = Sort of 2 = A lot 0 = Don't know

The **total** Exercise Norms Scale score is the sum of J1 to J5.

Normas Ejercicio Escala (Hijas)**Código# _____**

¿Cuánto cree usted que las siguientes personas esperan que usted haga ejercicio (actividad hasta el punto de sudar, respirar rápido, o su corazón late rápido)? Coloque una marca (✓) en la caja de su respuesta.

J1. Miembros de la familia	En absoluto	Tipo de	mucho
J2. Mi mejor amiga	En absoluto	Tipo de	mucho
J3. Cinco o seis amigas que pasan la mayor parte de mi tiempo con	En absoluto	Tipo de	mucho
J4. Maestro estoy más cerca de	En absoluto	Tipo de	mucho
J5. Mi médico	En absoluto	Tipo de	mucho

Appendix J

Code # _____

EXERCISE CONFIDENCE SURVEY (Exercise Self-Efficacy)

Below are sentences about exercise. Exercise is being active enough to breathe fast, get sweaty, or have your heart beat fast.

Please put a check in the box to show how true each sentence is about you.

	Not at all true	Not very true	In- between	Sort of true	Very True
G1. I could exercise even if I was tired					
G.2 I could exercise even if I had other things I wanted to do					
G.3 I could exercise even if I had to exercise alone.					
G.4 I could exercise even if I had a bad day at school					
G. 5 I could exercise even if I was feeling lazy.					
G. 6 I could exercise even if I was not very good at it.					
G. 7 I could exercise even if I was sore from exercising the day before.					
G. 8 I could exercise even if I was not in the mood.					

Scoring Instructions for Self-Regulatory Efficacy Score as follows:

Not at all true – 1

Not very true – 2

In-between – 3

Sort of true – 4

Very true – 5

Add the scores across all items and calculate mean self-regulatory score.

Pender, N.J, Garcia, A., Ronis, D. (1995) Health Promotion Model - Instruments to Measure HPM Behavioral Determinants : Perceived Regulatory Self-Efficacy [Efficacy for Overcoming Barriers to Physical Activity]

Code # _____

Eficacia de Ejercicio Para Hijas: Favor de completar por hijas

Las siguientes son oraciones sobre ejercicio. El ejercicio es ser activo para respirar que el pulso suba.

Favor de indicar en la caja la respuesta que más le pertenezca a usted:

	No del todo cierto	No muy cierto	En-entre	especie de verdad	muy cierto
1. Puedo hacer ejercicio aunque este cansado/a					
2. Podría hacer ejercicio aunque tenga otras cosas que hacer					
3. Haría ejercicio aunque nadie me acompañe					
4. Haría ejercicio aunque tuviera un día pesado en la escuela					
5. Haría ejercicio aunque me sintiera con pereza o sin ganas de hacer nada					
6. Haría ejercicio aunque no fuera muy buena o tuviera mucha experiencia en actividades físicas					
7. Haría ejercicio aunque todavía estuviera dolida por hacer ejercicio el día anterior					
8. Pudiera hacer ejercicio aunque no tuviera ganas de ser activa					

EXERCISE CONFIDENCE SURVEY (Exercise Self-Efficacy) Mothers

Below is a list of things people might do while trying to increase or continue regular exercise. We are interested in exercises like running, swimming, brisk walking, bicycle riding, or aerobics classes.

Whether you exercise or not, please rate how confident you are that you could really motivate yourself to do things like these consistently, for at least six months.

Please circle one number for each question.

How sure are you that you can do these things?

	I know I cannot		Maybe I can		I know I can	Does not apply
1. Get up early, even on weekends, to exercise.	1	2	3	4	5	(8)
2. Stick to your exercise program after a long, tiring day at work.	1	2	3	4	5	(8)
3. Exercise even though you are feeling depressed.	1	2	3	4	5	(8)
4. Set aside time for a physical activity program; that is, walking, jogging, swimming, biking, or other continuous activities for at least 30 minutes, 3 times per week.	1	2	3	4	5	(8)
5. Continue to exercise with others even though they seem too fast or too slow for you.	1	2	3	4	5	(8)
6. Stick to your exercise program when undergoing a stressful life change (e.g., divorce, death in the family, moving).	1	2	3	4	5	(8)
7. Attend a party only after exercising.	1	2	3	4	5	(8)
8. Stick to your exercise program when your family is demanding more time from you.	1	2	3	4	5	(8)
9. Stick to your exercise program when you have household chores to attend to.	1	2	3	4	5	(8)
10. Stick to your exercise program even when you have excessive demands at work.	1	2	3	4	5	(8)
11. Stick to your exercise program when social obligations are very time consuming.	1	2	3	4	5	(8)

ENCUESTA de confianza del ejercicio (ejercicio autoeficacia) La Madre

Abajo se encuentra una lista de cosas que la gente podría hacer al intentar aumentar o continuar el ejercicio regular. Estamos interesados en ejercicios como correr, nadar, caminar, montar en bicicleta o clases de aeróbicos. Si usted ejercer o no, por favor valore la confianza que usted tiene que realmente podría motivar a sí mismo para hacer cosas como estas constantemente, durante al menos seis meses. Por favor marque un número

How sure are you that you can do these things?	Sé que no puedo	Tal vez pueda	Sé que puedo	No se aplica
1. Levantarse temprano, incluso los fines de semana, para ejercer.	1 2	3 4	5 6	8
2. Adherirse a su programa de ejercicio después de un largo y agotador día en el trabajo.	1 2	3 4	5 6	8
3. Adherirse a su programa de ejercicio después de un largo y agotador día en el trabajo.	1 2	3 4	5 6	8
4. Reservar tiempo para un programa de actividad física; Es decir caminar, trotar, natación, ciclismo u otros continuo actividades durante al menos 30 minutos, 3 veces por semana.	1 2	3 4	5 6	8
5. Seguir ejerciendo con los demás aunque ellos parece demasiado rápido o demasiado lento para usted.	1 2	3 4	5 6	8
6. Adherirse a su programa de ejercicio cuando se someten a una cambio de vida estresante (p. ej., divorcio, muerte en la familia, en movimiento).	1 2	3 4	5 6	8
7. Asistir a una fiesta sólo después del ejercicio.	1 2	3 4	5 6	8
8. Adherirse a su programa de ejercicio, cuando su familia es exigen más tiempo de usted.	1 2	3 4	5 6	8
9. Adherirse a su programa de ejercicio cuando tienes para atender los quehaceres domésticos.	1 2	3 4	5 6	8
10. Pegarse a su programa de ejercicio, incluso cuando tienes exigencias excesivas en el trabajo	1 2	3 4	5 6	8
11. Adherirse a su programa de ejercicio cuando social obligaciones son muy lentos.	1 2	3 4	5 6	8

Physical Activity Enjoyment Scale – Girls to complete

	Disagree a lot	Disagree	Neutral	Agree	Strongly agree
1. I enjoy it	1	2	3	4	5
2. I feel bored	1	2	3	4	5
3. I dislike it	1	2	3	4	5
4. I find it pleasurable	1	2	3	4	5
5. It's no fun at all	1	2	3	4	5
6. It gives me energy	1	2	3	4	5
7. It makes me depressed	1	2	3	4	5
8. It's very pleasant	1	2	3	4	5
9. My body feels good	1	2	3	4	5
10. I get something out of it	1	2	3	4	5
11. It's very exciting	1	2	3	4	5
12. It frustrates me	1	2	3	4	5
13. It's not at all interesting	1	2	3	4	5
14. It gives me a strong feeling of success	1	2	3	4	5

When I am active.....please circle the response that applies to you.

código# _____

Escala de cuanto se Disfruta la Actividad Física (para adolescente) Cuando soy activa.....favor de circular la respuesta que más se aplique a ti:

	No estoy de acuerdo completamente	No estoy de acuerdo	Neutral	Estoy de acuerdo	Estoy de acuerdo completamente
1. Lo disfruto	1	2	3	4	5
2. Me siento aburrida	1	2	3	4	5
3. No me gusta	1	2	3	4	5
4. Me trae placer	1	2	3	4	5
5. No es divertido	1	2	3	4	5
6. Me da energía	1	2	3	4	5
7. Me deprime	1	2	3	4	5
8. Me hace sentir bien	1	2	3	4	5
9. Mi cuerpo se siente bien	1	2	3	4	5
10. Me llevo algo mas que placer físico	1	2	3	4	5
11. Es muy excitante	1	2	3	4	5
12. Me frustra	1	2	3	4	5
13. No es muy interesante	1	2	3	4	5
14. Me da un placer fuerte de exito	1	2	3	4	5

Appendix K

Code# _____

Physical Activity Enjoyment Scale (PACES) for Mothers to Complete

When I am active.....please circle the response that applies to you.

	Disagree a lot	Disagree	Neutral	Agree	Strongly Agree
1. I enjoy it	1	2	3	4	5
2. I feel bored	1	2	3	4	5
3. I dislike it	1	2	3	4	5
4. I find it pleasurable	1	2	3	4	5
5. I am very absorbed in this activity	1	2	3	4	5
6. It's no fun at all	1	2	3	4	5
7. I find it energizing	1	2	3	4	5
8. It makes me depressed	1	2	3	4	5
9. It is very pleasant	1	2	3	4	5
10. I feel good physically while doing it	1	2	3	4	5
11. It's very invigorating	1	2	3	4	5
12. I am frustrated by it	1	2	3	4	5
13. It's very gratifying	1	2	3	4	5
14. It's very exhilarating	1	2	3	4	5
15. It's not at all stimulating	1	2	3	4	5
16. It gives me a strong sense of accomplishment	1	2	3	4	5
17. It's very refreshing	1	2	3	4	5
18. I felt as though I would rather be doing something else	1	2	3	4	5

código# _____

Escala disfrute sobre actividad física (pasos) para que las madres completa

Cuando estoy activa... por favor encierre en un círculo la respuesta que le corresponda.

	Disagree a lot	Disagree	Neutral	Agree	Strongly Agree
1. Lo disfruto	1	2	3	4	5
2. Me siento aburrida	1	2	3	4	5
3. No me gusta	1	2	3	4	5
4. Me trae placer	1	2	3	4	5
5. Soy muy absorbido en esta actividad	1	2	3	4	5
6. No es divertido	1	2	3	4	5
7. I find it energizing	1	2	3	4	5
8. Me deprime	1	2	3	4	5
9. Me hace sentir bien	1	2	3	4	5
10. Me siento bien físicamente mientras haciendo	1	2	3	4	5
11. Es muy estimulante	1	2	3	4	5
12. Me siento frustrado por ella	1	2	3	4	5
13. Es muy gratificante	1	2	3	4	5
14. Es muy emocionante	1	2	3	4	5
15. Es no estimulante	1	2	3	4	5
16. Me da un fuerte sentido de logro	1	2	3	4	5
17. Es muy refrescante	1	2	3	4	5
18. Sentí como si estarían haciendo más bien algo más	1	2	3	4	5

Appendix L

Planning for Exercise – English version

Code #

Directions: Please think carefully about each statement below and indicate how often you do each of the following activities related to exercise (never, sometimes, or often). Please circle the correct response for you.

1. I plan specific times for exercise or active sports in my weekly schedule.	Never	Sometimes	Often
2. I lay out my exercise shoes and clothes to remind me to exercise	Never	Sometimes	Often
3. I exercise in a specific location or facility	Never	Sometimes	Often
4. I keep written records of my exercise activity.	Never	Sometimes	Often
5. I reward myself for exercising.	Never	Sometimes	Often
6. I post notes where I can see them to remind me to exercise.	Never	Sometimes	Often
7. I vary my exercise routine to avoid boredom.	Never	Sometimes	Often
8. I work toward exercise goals that are progressively more challenging.	Never	Sometimes	Often
9. I consider exercise so important in my life that I allocate time for it.	Never	Sometimes	Often
10. I let people know about my commitment to exercise.	Never	Sometimes	Often
11. I encourage my friends to exercise.	Never	Sometimes	Often

Planning For Exercise- Spanish Version **código#** _____**Planear para Ejercicios**

Instrucciones: Por favor piense cuidadosamente sobre cada declaración siguiente y indique con que frecuencia usted es parte de cada actividad relacionada con ejercicio (nunca, a veces, frecuentemente)

1. Planeo tiempos específicos para deportes o ejercicios por semana	Nunca	A veces	Frecuentemente
2. Saco y tengo a la mano mis zapatos y ropa de ejercicio para recordarme a mi misma	Nunca	A veces	Frecuentemente
3. Hago ejercicio en un lugar o locación específica	Nunca	A veces	Frecuentemente
4. Tengo archivos y datos escritos sobre mis actividades físicas	Nunca	A veces	Frecuentemente
5. Me recompenso por hacer ejercicio	Nunca	A veces	Frecuentemente
6. Escribo y pongo notas en lugares donde pueda verlas para recordarme de hacer ejercicio	Nunca	A veces	Frecuentemente
7. Mis ejercicios son variados para prevenir aburrimiento	Nunca	A veces	Frecuentemente
8. Trabajo por completar metas de ejercicios que son cada vez más difíciles	Nunca	A veces	Frecuentemente
9. Considero que el ejercicio es muy importante en mi vida que hago tiempo para hacerlo	Nunca	A veces	Frecuentemente
10. Dejo que la gente sepa sobre mi compromiso a hacer ejercicio	Nunca	A veces	Frecuentemente
11. Alentó y apoyo a mis amigos para que hagan ejercicio	Nunca	A veces	Frecuentemente

Appendix M

Table A

Mother and Daughter Characteristics as Mean and Standard Deviation of the Sample

Variable	Mother (n=79)		Daughter (n=79)	
	M	(SD)	M	SD
Age	36.53	(5.43)	9.89	(1.21)
Education	9.70	(3.39)	4.55	(1.20)
Hours of Sleep	7.17	(.98)	9.25	(1.13)
Years in U.S.	17.66	(8.14)	9.60	(1.79)
BMI	29.876	(6.13)	21.10	(4.44)

Table B

Mother Characteristics as Frequency and Percentage of Sample

Variable	Mother (n=79) n Percentage
Race	
Hispanic	79 (100)
Employment	
Employed by someone or a company	44 (55.7)
Self-employed	3 (3.8)
Out of work and looking for work	10 (12.7)
Out of work but not currently looking for work	2 (2.5)
Homemaker	16 (20.3)
Student	1 (1.3)
Retired	1 (1.3)
Unable to work	2 (2.5)
Income	
less than 10,000	9 (11.4)
11,000-20,000	21 (26.6)
21,000-30,000	25 (31.6)
31, 000-51,000	11 (13.9)
51,000 +	11 (13.9)
Unknown	1 (1.3)
Number of Children	
One	5 (6.3)
Two	18 (22.8)
Three	26 (32.9)
Four	18 (22.8)
Five	5 (6.3)
Six or more	7 (8.9)

Appendix N

Subject	RE: requesting permission to use PACES tool in study
From	Rodney K Dishman <rdishman@uga.edu>
Date	Friday, January 11, 2013 3:29 pm
To	"Suzanne M. Keep" <keeps@pegasus.rutgers.edu>

Of course, Suzanne, you have permission.

Good luck with your study. Please keep me informed about your success.

I wonder if our self-motivation measure might moderate commitment? I've attached the short form versions for adults and children, just in case.

From: Suzanne M. Keep [keeps@pegasus.rutgers.edu]
 Sent: Friday, January 11, 2013 3:14 PM
 To: Rodney K Dishman
 Subject: requesting permission to use PACES tool in study

Hello Dr. Dishman - I am requesting to use your PACES tool from Physical Activity Enjoyment Scale: Motl, R.W., Dishman, R. K., Saunders, R., Dowda, M., Felton, G., Pate, R.R. (2001). Measuring enjoyment of physical activity in adolescent girls. American Journal of Preventive Medicine 21(2), 110-117, in my dissertation study. My research study is on Factors affecting commitment to a plan of action of physical activity among low-income Hispanic mothers and their daughters (ages 8-12). I have successfully defended my dissertation proposal and have IRB approval, and am ready to start data collection.

I am thankful you answered your phone today!

thank you,

Suzanne Keep

Subject	RE: Permission to use Adolescent Lifestyle Questionnaire
From	Angela Gillis <agillis@stfx.ca>
Date	Friday, January 18, 2013 12:11 pm
To	"Suzanne M. Keep" <keepsm@pegasus.rutgers.edu>

Hello Suzanne,

I am pleased to give permission to use the ALQ in your dissertation research. I have attached a copy of it to this message.

I wish you much success in your PhD study. Completing a PhD is an exciting time in one's professional career. I have two beautiful daughters who were nine years and thirteen years old when I was working on my research. They now have children of their own, making me a proud grandmother!

Best wishes for success in your work.

Angela

Angela Gillis, PhD, RN
Professor
PO Box 5000
St FX University School of Nursing
West Street Entrance (Courier Address)
Antigonish, NS
B2G 2W5

-----Original Message-----
From: Suzanne M. Keep [mailto:keepsm@pegasus.rutgers.edu]
Sent: Friday, January 18, 2013 12:48 PM
To: Angela Gillis
Subject: Permission to use Adolescent Lifestyle Questionnaire

Dear Dr. Gillis- I would like permission to use your Adolescent Lifestyle Questionnaire in my dissertation research. I would like to use the items related to physical activity/exercise. I have read about your instrument in the 1997 Canadian Journal of Nursing Research 29(1). My interest of study is self-efficacy, societal norms, activity related affect among Hispanic mothers and their daughters (ages 8-12).

Thank you for your consideration.

Sincerely,

Suzanne Keep

Suzanne M. Keep PhD(c), RN
Rutgers College of Nursing
231-215-0895 (cell)
616-647-5998 (home)



Fr. Steven D. Cron, Pastor
St. Joseph the Worker Church
Church: 225 32nd Street, S.W.
Office: 3138 Birchwood Ave., S.W.
Wyoming, MI 49548-1048
Phone: (616) 456-7982
FAX: (616) 301-1759
E-mail: stevencron@sanjoseobrero.net

May 14, 2012

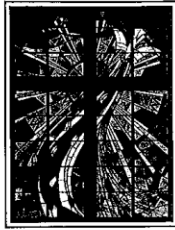
Dear Members of the IRB at Rutgers University,

I am writing this letter on behalf of PhD Rutgers Nursing candidate Suzanne M. Keep, RN, in support of her conducting her Dissertation research at our parish, Iglesia Católica San José Obrero (St. Joseph the Worker Catholic Church). Suzanne will meet with potential participants after our 11:00 A.M. Mass in Spanish on Sundays this summer and possibly in the fall. We will provide space for the study to take place and will assist in finding interpreters to help those individuals who do not speak or write English well.

While her research will be of value to her in writing her Dissertation, we expect that it will be of value to our parish community as well, and for both reasons we welcome Suzanne and her work.

Sincerely yours,

(Rev.) Steven D. Cron
Pastor
Parroquia San José Obrero / St. Joseph the Worker Parish



Holy Name of Jesus Parish

1630 Godfrey Avenue S.W. • Wyoming, MI 49509

Dear Members of the IRB at Rutgers University,

This letter is in support of PhD Rutgers Nursing candidate, Suzanne M. Keep RN, to conduct her Dissertation research at our Parish, Holy Name of Jesus, in Wyoming, Michigan. Suzanne will meet with potential participants after our Spanish 11:30am mass on Sundays this summer and possibly in the fall. We have a large population of Hispanic/Latino people who come to this mass.

We will provide space for the study to take place and will assist in finding translators to help those individuals who do not speak or write English.

Sincerely,

A handwritten signature in black ink, appearing to read "Stephen Dudek". The signature is fluid and cursive, with the first name "Stephen" and last name "Dudek" clearly distinguishable.

Fr. Stephen Dudek, Pastor

Holy Name of Jesus Parish

Phone: (616) 241-6489 / Fax: (616) 241-6480 / Email: holynamenameofjesus@comcast.net

RUTGERS UNIVERSITY
Office of Research and Sponsored Programs
ASB III, 3 Rutgers Plaza, Cook Campus
New Brunswick, NJ 08901

July 23, 2012

P.I. Name: Keep
Protocol #: 12-755M

Suzanne M. Keep
3676 Bridgehampton Drive NE
Grand Rapids MI 49546

Dear Suzanne Keep:

✓
(Initial / Amendment / Continuation / Continuation w/ Amendment)

Protocol Title: "The Role of Societal Norms, Exercise Self-Efficacy and Activity Related Affect on Commitment to a Plan for Exercise Among Hispanic Adolescent Girls and their Mothers"

This is to advise you that the above-referenced study has been presented to the Institutional Review Board for the Protection of Human Subjects in Research, and the following action was taken subject to the conditions and explanations provided below:

Approval Date:	5/30/2012	Expiration Date:	5/29/2013
Expedited Category:	7	Approved # of Subject(s):	200

This approval is based on the assumption that the materials you submitted to the Office of Research and Sponsored Programs (ORSP) contain a complete and accurate description of the ways in which human subjects are involved in your research. The following conditions apply:

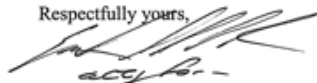
- **This Approval-**The research will be conducted according to the most recent version of the protocol that was submitted. **This approval is valid ONLY for the dates listed above;**
- **Reporting-**ORSP must be immediately informed of any injuries to subjects that occur and/or problems that arise, in the course of your research;
- **Modifications-**Any proposed changes **MUST** be submitted to the IRB as an amendment for review and approval prior to implementation;
- **Consent Form(s)-**Each person who signs a consent document will be given a copy of that document, if you are using such documents in your research. The Principal Investigator must retain all signed documents for at least three years after the conclusion of the research;
- **Continuing Review-**You should receive a courtesy e-mail renewal notice for a Request for Continuing Review before the expiration of this project's approval. However, it is your responsibility to ensure that an application for continuing review has been submitted to the IRB for review and approval prior to the expiration date to extend the approval period;

Additional Notes: Expedited Approval per 45 CFR 46.110

Failure to comply with these conditions will result in withdrawal of this approval.

Please note that the IRB has the authority to observe, or have a third party observe, the consent process or the research itself. The Federal-wide Assurance (FWA) number for the Rutgers University IRB is FWA00003913; this number may be requested on funding applications or by collaborators.

Respectfully yours,



Sheryl Goldberg
Director of Office of Research and Sponsored Programs
gibel@grants.rutgers.edu

cc: Karen D'Alonzo

Dear Suzanne:

We only have the instruments available that you see on the website.
 You are welcome to translate and back translate the instruments into
 Spanish ---see information on translation in the Deep Blue Website at
 UM. Sorry I cannot be of greater assistance with Spanish
 translations. If you do translate the instruments, please let me know.

Wishing you good health,

Nola Pender

Quoting keepsm@pegasus.rutgers.edu:

> Hello Dr. Pender - I am using your HPM for my dissertation, and I have a
 > question regarding social support within the cultural context of social
 > relationships and the Hispanic/Latino population. I would like to know if
 > you have developed any specific measurement tools for the Hispanic/Latino
 > population to measure societal norms.
 >
 > I have been reviewing your UofM site for information on the HPM.
 > I did see the HPLP in English and Spanish and would like to know if you
 > have tools for exercise self-efficacy, activity related affect, commitment
 > to a plan of physical activity and societal norms (as mentioned above). I
 > live in Grand Rapids, MI, and am planning on collecting data this summer
 > in GR and in Holland, MI. My concern is that many of the mothers of
 > adolescent girls speak and write Spanish, so I would like to have the
 > tools in both languages.
 >
 > Also, I appreciate having the adolescent tools for planning for exercise,
 > exercise norms, and ESE, on the UofM website, but wondered if the adult
 > versions of these tools are available on a website as well.
 >
 > Thank you,
 >
 > Suzanne Keep
 >
 >
 >
 > Dear Suzanne:
 >>
 >> You have my permission to use and reprint the revised Health Promotion
 > Model in your dissertation. Good luck with your academic work.
 >>
 >> Wishing you good health,
 >>
 >> Nola Pender

Appendix O

Suzanne M. Keep

3676 Bridgehampton Dr., Grand Rapids, MI | 231-215-0895 | keepsm@pegasus.rutgers.edu

Date and place of birth January 26, 1957, Detroit, MI

EDUCATION

Wayne State University, Detroit, MI 1987
Masters of Science Community Health
Minor in Nursing Administration

Nazareth College, Kalamazoo, MI
Bachelor of Science in Nursing 1979

Bishop Gallagher High School, Harper Woods, MI 1975

TEACHING EXPERIENCE

University of Detroit Mercy at Aquinas College in Grand Rapids, MI 2006-present
Chair of the Pre-licensure BSN program
Assistant Professor of Nursing for theory courses and clinical practicum
for undergraduate and RN-BSN program

University of Michigan – Flint 2005-2006
Project Coordinator for the Accelerated Health Care Career
Training Initiative Grant funded by the State of Michigan;
Clinical Coordinator – Facilitated affiliation agreements with clinical sites
Adjunct clinical and theory in

Saginaw Valley State University
Adjunct Nursing Instructor, 2004-2005; 1996-2000, 2004-2005
Educator with Michigan State University Medical Students and
SVSU nursing students on Asset Based Community Development program
RN to BSN Coordinator; 1998-2000

Michigan Community Blood 2003-present
Nursing assessment and preparation patients for bone marrow transplants

Visiting Nurses, Flint, Michigan 2003-2004
Conducted Flu Shot clinics

U of M Ann Arbor, MI 1988-1993
Nursing Instructor for Outreach program in Grand Rapids, MI

Research Associate 1988-1989
CDC funded study on HPV, Dr. Richard Reid

Hospice of Greater Kalamazoo 1983-1987
Program Director

Kalamazoo Visiting Nurses 1980-1983
Staff nurse

Bon Secours Hospital, Grosse Pointe, MI 1979-1980
Staff nurse