

The Relationships among Spirituality, Self-Esteem, and Participation in Physical Activity  
in Late Adolescent and Young Adult Females

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## ABSTRACT OF THE DISSERTATION

The Relationships among Spirituality, Self-Esteem, and Participation in Physical Activity  
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The purpose of this study was to explore the relationships among spirituality, self-esteem and participation in physical activity among late adolescent and young adult females. Pender's (2015) Health Promotion Model served as the theoretical framework from which four hypotheses were derived: 1) Spirituality will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents; 2) Spirituality will have a positive relationship to self-esteem among late adolescent and young adult female respondents; 3) Self-esteem will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents; 4) Self-esteem will intervene on the relationship between spirituality and participation in physical activity among late adolescent and young adult female respondents. Secondary analysis of publically available data from Wave III of The

National Longitudinal Survey of Adolescent to Adult Health (Add Health) was conducted. Tobit regression was used to test each of the hypotheses. Hypotheses one and four were supported. A statistically significant inverse relationship was found between spirituality and self-esteem, this was the opposite of the direction indicated by hypothesis two. While an inverse relationship was indicated between self-esteem and participation in physical activity, the finding was not statistically significant. The findings of this study support the inclusion of mental health measures such as self-esteem when exploring the relationship between spirituality and physical activity. Further, this study reflects the complexities of the relationships among spirituality, self-esteem, and participation in physical activity. Finally, these findings may be used to support multifaceted, collaborative, and holistic interventions to increase physical activity rates among late adolescent and young adult females.

## Dedication and Acknowledgements

### Dedication

For my God, your light reminds me. For my husband, your love restores and nurtures me. For my children, your curiosity and authenticity inspire me. For my family, your foundation roots and supports me. For my friends, your confidence and enthusiasm fuel me. For my mentors, your wisdom and insight guide me. For my dissertation committee and colleagues, your teamwork and experience advise me. For my students, your generosity and sincerity encourage me. For my patients, your strength and trust humble me. You all nourish and sustain me. Without the grace of God and without each of you this journey would have been even more dark and relentless.

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Note: Use of this acknowledgment requires no further permission from the persons named.

## Table of Contents

### CHAPTER I. THE PROBLEM

- A. Discussion of the Problem
- B. Statement of the Problem
- C. Sub-problems
- D. Definition of Terms – Conceptual and Operational
- E. Delimitations
- F. Significance of the Study
- G. Summary

### CHAPTER II. REVIEW OF THE LITERATURE

- A. Theoretical Framework
- B. Empirical Support
- C. Theoretical Rationale
- D. Hypotheses
- E. Summary

### CHAPTER III. METHODS

- A. Summary of the Data Set
- B. Research Setting and Sample
- C. Protection of Participant's Rights
- D. Instruments/Measures
- E. Variables of Interest and Control Variables
- F. Data Collection

G. Plan for Analysis

CHAPTER IV. ANALYSIS OF THE DATA

- A. Psychometric Properties of Instruments used in the Study
- B. Statistical Description of the Variables
- C. Hypothesis Testing

CHAPTER V. DISCUSSION OF FINDINGS

- A. Findings for each Hypothesis
- B. Additional or Ancillary Findings

CHAPTER VI. SUMMARY, CONCLUSIONS, IMPLICATIONS,  
RECOMMENDATIONS

- A. Summary
- B. Conclusions
- C. Implications
- D. Recommendations

REFERENCES

The Relationships among Spirituality, Self-Esteem, and Participation in Physical Activity  
in Late Adolescent and Young Adult Females

**CHAPTER I.**

**The Problem**

Nurses have a long tradition of concern for the health of the “whole” patient (Cumbie, 2001). Florence Nightingale (1860) recognized that nurses “have charge of someone’s health” (preface), tending to not only the ill, but also assisting the healthy by paying attention to their unique physical, environmental, and spiritual needs (Nightingale, 1860). The concept of health is widely accepted as essential to the nursing metaparadigm (Fawcett, 2000) and attention to the uniqueness of each individual is recognized as a fundamental commitment of modern nursing care (ANA, 2010). Nursing care and assessment of patient needs must include both inquiry about health and spiritual needs (The Joint Commission, 2014). A shift in the national focus from disease management to health promotion (CDC, 2011) further supports the value of renewed focus on the unique health perspectives of individuals and calls on nurses to carefully consider the influence of a variety of factors, including spirituality, on the health promoting behaviors of patients.

**Discussion of the Problem**

It is well known that health promotion behaviors such as physical activity are necessary for the prevention of chronic disease (Hallal, Victoria, Azevedo, & Wells, 2006). The CDC (2014) has monitored and continues to monitor physical inactivity of youth and adolescents, as it has been consistently identified as a priority health risk for chronic disease. Chronic diseases account for more than 75% of United States (U.S.)



health care costs each year (CDC, 2011), yet many chronic diseases are preventable, particularly when health promoting behaviors are established in early life (CDC, 2014; Hallal et al., 2006). Nonetheless, the U.S. Department of Health and Human Services (HHS) (Fakhouri et al., 2014) suggests that only one-quarter of U.S. youth meet physical activity guidelines. Those meeting guidelines in underserved diverse populations is even less.

Research has shown that physical activity provides an opportunity for both physical and emotional wellness (Brooks & Magnusson, 2007; Hallal et al., 2006; Spurr, Bally, Ogenchuk & Waller, 2012; Zook, Saksvig, Wu & Young, 2014). For young women, adolescence often marks a decrease in both physical activity and emotional wellness (Brooks & Magnusson, 2007). For some, however, physical activity increases (Zook et al., 2014). A recent study revealed that while personal, social and environmental factors all predicted maintenance of a young woman's level of physical activity, only personal or individual factors predicted the initial adoption of physical activity (Zook et al., 2014). Spirituality may be one factor associated with participation in physical activity among late adolescent and young adult females. Theory and research indicate that intrinsic or personal resources, such as spirituality, are associated with participation in physical activity (Biddle, Whitehead, O'Donovan & Nevill, 2005; Pender, Murdaugh & Parsons, 2015). Nurses are well positioned to promote the adoption of positive physical behaviors by late adolescents and young adults by applying a holistic approach to assessment and intervention (Spurr et al., 2012).

Patients seek personalized care to meet their complex needs, including their spiritual needs (Puchalki, Vitillo, Hull, & Reller, 2014; White House Commission on

Complementary and Alternative Medicine Policy, 2002). Spirituality may be viewed from various perspectives: as an individual, intrinsic resource; extrinsically adopted from a group characteristic, or through connection with others (Fiorito & Ryan, 1998). It is suggested that spirituality perceived as an intrinsic or proximal (personal factor) resource motivates actions more strongly than when spirituality is extrinsically or distally accepted (Cotton, Zebracki, Rosenthal, Tsevat, & Drotar, 2006; Fiorito & Ryan, 1998, Lauver, 2000). Extrinsic or sociocultural/parental religious norms or affiliations seem to be inadequate or poor measures of adolescent choices about health behaviors (Rew & Wong, 2006). Both theory and research suggest that in adolescence, a personal or intrinsic perception of spirituality develops (Erickson, 1968; Fowler, 1995).

Data from various studies suggests that spirituality is, particularly for late adolescents and emerging adults and especially for those from diverse ethnic backgrounds, a protective factor against negative health outcomes (Chae, Kelly, Brown, & Bolden et al., 2004; Cotton et al.; Dyson, Cobb & Forman, 1997; Guinn & Vincent, 2002) and that spirituality seems to have a positive effect on adolescent health attitudes or behaviors (Cotton et al., 2006; Rew & Wong, 2006). Further, the characteristics of a woman's spirituality seem to have much in common with her health (Lauver, 2000; Pender et al., 2015). While spirituality can be viewed from many perspectives and by many schools of thought (Emmons, 2000; Helminiak, 2006; Sessanna, Finnell, & Jezewski, 2007), it is a concept that has been virtually excluded in the health promotion literature (Rew & Wong, 2006; White, 2008). The pathologizing of spirituality is evident in the plethora of literature available focusing on spirituality as simply a protective factor against or a coping mechanism in disease states (Baldacchino & Draper, 2001; Kelly,

2004). Spirituality research with a positive health focus is needed for a holistic understanding of the concept. Pender et al. (2015) have suggested that information gathered from a spiritual assessment can contribute valuable knowledge when developing a health promotion intervention, especially given that spirituality is emerging as a factor essential to self, personhood, and being (Faull & Hills, 2006).

Theory posits that motivation to engage in a health promotion behavior may be determined directly or indirectly, through activity-related affect, by personal factors, such as spirituality (Pender et al., 2015). Holistic consideration of motivating personal factors is an area in need of further study (Cotton et al., 2006; Resnick et al., 1997; Rew & Wong, 2006; Spurr et al., 2012; Zook et al., 2014). In order to develop effective, nurse guided, person centered interventions, it is first necessary to identify how personal factors contribute to or are motivation for health behaviors (Cotton et al., 2006; Resnick et al., 1997; Rew & Wong, 2006). Furthermore, research suggests that further study of spirituality as an independent variable in the development of late adolescents and young adults is needed (Yonker, Schnabelrauch & DeHaan, 2012). Krause, Serlin, Ward, Rony, Ezenwa et al. (2010) and MacKinnon, Lockwood, Hoffman, West & Sheets (2002) suggest that intervening variables may influence the relationship between independent variable of interest and the dependent variable of interest. Thus, in order to fully understand the impact of personal factors (spirituality) on health behaviors, studies must consider the influence of affect or mental health factors such as self-esteem, on the behavioral outcome of interest (Cotton et al., 2006; Hill & Pargament, 2003; Koenig, 2011). Finally, research that considers physical activity beyond the limits of organized sports is suggested (Brooks & Magnusson, 2007; Zook et al., 2014). Given that there is

very little research, particularly in nursing, exploring spirituality as an individual factor motivating attitudes and behaviors concerning physical activity among late adolescents and emerging adults, this study tested the interrelationship between personal factors (spirituality) and health promoting behavior (physical activity) while including activity related affect (self-esteem) as purported in the Health Promotion Model (Pender et al., 2015).

### **Statement of the Problem**

What are the relationships among spirituality, self-esteem, and physical activity in the late adolescent and young adult population of female respondents?

### **Sub problems:**

1. What is the relationship between spirituality and participation in physical activity for late adolescent and young adult female respondents?
2. What is the relationship between spirituality and self-esteem for late adolescent and young adult female respondents?
3. What is the relationship between self-esteem and participation in physical activity for late adolescent and young adult female respondents?
4. What is the relationship between spirituality and participation in physical activity when self-esteem is controlled for statistically?

### **Definition of Terms – Conceptual and Operational**

Dependent variable – Physical Activity

The dependent variable of interest was the health promoting behavior, physical activity. A health promoting behavior is an action “directed toward attaining positive health outcomes...” (Pender, Murdaugh, & Parsons, 2006, p.57). Health promoting

behaviors were those behaviors that improve overall health. Physical activity represented the theoretical concept of health promoting behavior.

Physical activity was conceptually defined as the movement of skeletal muscle (Caspersen, Powell, & Christenson, 1985). It reflects a range of levels of activity from light activity to vigorous activity which may be monitored, “planned, structured, repetitive, and purposive...” (Caspersen, Powell, & Christenson, 1985, p.128) or may be an incidental part of daily life or leisure (Walker & Hill-Polerecky, 1996). The purpose of physical activity is to condition the body leading to some health outcome (Caspersen, Powell, & Christenson, 1985) such as increasing fitness or well-being (Vaughn, 2009). Physical activity was operationally defined as a series of self-report responses to questions in Wave III of the Add Health Data set Section 33: Daily Activities.

#### Intervening variable – Self-esteem

The intervening or mediating variable of interest was activity-related affect. Activity-related affect is defined as “subjective feeling states....” (Pender et al., 2006, 54). Subjective feeling states influence whether or not a person will adopt or maintain a given behavior. Positive or negative affect as measured by psychological indicators may be useful in the study of the relationship between affect and health behaviors (Flueckiger, Lieb, Meyer & Jutta, 2014). Behaviors associated with a positive affect are likely to be repeated or maintained (Pender et al., 2015). Self-esteem represented the theoretical concept activity-related affect.

Self-esteem was conceptually defined as feeling about one’s own self-worth which reflects evaluation of one’s own worth (Crocker & Major, 1989; Liu, Wu, & Ming, 2015). Self-esteem is a fundamental aspect of an adolescent’s psychological function

(Pinquart, 2012). Self-esteem was operationally defined as a series of self-report responses to questions in Wave III of the Add Health Data set Section 21: Social Psychology and Mental Health.

#### Independent variable – Spirituality

The independent variable of interest was the personal factor, spirituality.

“Personal factors are categorized as biological, psychological, and sociocultural” (Pender et al., 2006, 52). Biological factors include observable or descriptive terms (Fawcett, 1992) such as age and gender. Psychological and sociocultural factors include abstract phenomenon (Fawcett, 1992) such as personality, acculturation, and ethnicity. Research suggests that spirituality has personological significance (Chang et al., 2014; Piedmont, 1999). Spirituality may be considered a synthesis as well as a unique personal expression of biological, psychological and sociocultural factors given that it is expressed through beliefs, values, traditions, and practices (Puchalski et al., 2014). The personal nature of adolescent spirituality is best assessed using measures of proximal spirituality or spiritual salience (i.e. extent to which one identifies themselves as spiritual, degree to which spirituality matters in life) (Yonker et al., 2012). Late adolescence and young adulthood mark an important time in spiritual development as the move from parental control allows for personal decision making. Spirituality represented the theoretical concept personal factor.

There is little consensus on the definition of spirituality (Chae et al., 2004; Chau, 2006; Puchalski et al., 2014). This is due to the term’s subjective and abstract nature, to theoretical debates, to multidisciplinary perspective, to diversification of the American population, to modernization of thought and to the interchangeable use of the terms

spirituality and religiosity in many publications (Chae et al., 2004; Zinnbauer, Pargament & Scott, 1999). Modern understanding reveals that spirituality and religiosity are distinct concepts, but for some, are related. Spirituality is a subjective feeling or experience that transcends organized religious affiliation (Fiorito & Ryan, 1998). From the Latin word *spiritualitatem* meaning a person's being or essence, spirituality is at the core of what it means to be human (Villagomez, 2005). Spirituality “encompass[es] a search for meaning, for unity, for connectedness, for transcendence, and for the highest of human potential” (Emmons, 1999, p. 5). Spirituality is, at least in part, the lived intrinsic and dynamic experience or journey of seeking ultimate meaning and purpose through the connection or relationship to the self, others, and nature (Burkhardt, 1994; Burkhardt & Nagai-Jacobson, 1994; Puchalski et al., 2014). For the purposes of this study, spirituality was operationally defined as a series of self-report responses to questions in Wave III of the Add Health Data set Section 31: Religion and Spirituality.

### **Delimitations**

The sample in this study was delimited to the publically available Wave III Add Health respondents (N=4,882).

### **Significance of the Study**

This study sought to address a gap in the knowledge regarding factors that affect late adolescent and young adult female participation in physical activity. Despite efforts to encourage, educate, and support physical activity, rates of participation in physical activity among adolescents, particularly among women and those of diverse backgrounds, remain lower than projected goals for Healthy People 2020 (HHS, 2008) and have, for more than a decade, been the focus of surveillance by the CDC (2014). Only 15% of all

high school students meet the physical activity goals set forth in Healthy People 2020 (CDC, 2011). According to the CDC's Youth Risk Surveillance (2014), female adolescents were less likely when compared to their male peers to report behaviors increasing physical activity. Additionally, literature suggests that female participation in physical activity declines through the adolescent years (Biddle et al., 2005). Further, Hispanic and African-American students were less likely when compared to their White peers to report behaviors increasing physical activity.

Physical activity in late adolescence and young adulthood has been shown to contribute to healthy behavior choices in adulthood, by ultimately reducing the burden of chronic disease on both the individual and the health system (Hallal et al., 2006; Hendricks, Murdaugh, & Pender, 2006). Health promotion and health education across the lifespan are essential to the role of the nurse. Thus, examining factors that contribute to physical activity among diverse late adolescent and young adult females may be useful to inform the development of nursing strategies to increase the physical activity levels of their late adolescent and young adult female patients which may contribute to meeting both lifelong patient centered needs and national health promotion goals.

Theory posits that personal factors such as spirituality and activity related affect such as self-esteem, may contribute to participation in health promoting behaviors such as physical activity (Pender et al., 2015). Extant research indicates that spiritual, psychological, and physical dimensions all contribute to adolescent wellness (Spurr et al., 2012; Rachele, Cuddihy, Washington & McPhail, 2014). There is emerging evidence that spirituality, understood as an intrinsic resource unique from religiosity, is associated with health, specifically with proactive health behaviors such as physical activity (Rew &



Wong, 2006). Individuals with higher spirituality scores seem to be more active when compared to their less spiritual peers (Nagel & Sgoutas-Emch, 2007). Additionally, intrinsic motivation for physical activity seems to support the continuation of that activity regardless of environment or peer support (Whitehead & Biddle, 2008). Spirituality is also correlated with psychological wellness (Wong, Rew, & Slaikew, 2006). While self-esteem typically decreases through adolescence, higher levels of spirituality are related to higher levels of self-esteem in late adolescents and emerging adults (Yonker et al., 2012). Among adolescents, higher self-reported levels of self-esteem are associated with smaller declines in physical activity (Craggs, Corder, van Sluijs & Griffin, 2011) and with increased likelihood of maintaining physical activity over time (Zook et al., 2014). Hendricks, Murdaugh and Pender (2006), as part of a report on the development of a health profile tool specific to adolescents, that adolescents with higher levels of self-esteem also have higher levels of health promoting profiles. Further, it is suggested that physical activity may have a positive impact on self-esteem (Ekeland, Heian, & Hagen, 2005; Hallal et al., 2006; Rachele et al., 2014) which implies that physical activity is valuable beyond prevention of disease and that the relationship may be circular (Rachele, Cuddihy, Washington & McPhail, 2014).

There has been no holistic and empirical investigation of both the individual and combined influence of spirituality and mental health on the physical activity of a large population of diverse late adolescent and young adult females. The purpose of this study was to address this gap in the available literature. This study expects to supplement existing knowledge about factors contributing to health promoting behavior by:

1. Narrowing the gap in the literature by contributing generalizable information about spiritual factors that might be related to physical activity while considering the influence of mental health
2. Contributing to a better understanding by nurses of the value of spiritual assessment and intervention to measurable health outcomes
3. Encouraging additional research in the areas of spirituality and physical activity, especially among diverse youth

### **Summary**

The World Health Organization (1948) defines health as a state of complete physical, mental, emotional, spiritual, social and environmental well-being and not merely the absence of disease or infirmity. Health is conceptualized to include many components, including spirituality. Spirituality is the least understood and the least studied of all of the factors of health. The complexity of the role that spirituality plays in health promotion behaviors is an area of burgeoning study. It is important that nurses recognize spirituality in the context of health and health behaviors consistent with the diverse individual perspectives of their patients (Pesut, Fowler, Taylor, Reimer-Kirkham, & Sawatzky, 2008) in order to contribute to person centered health promotion interventions. Further, given that rates of participation in physical activity are below recommended levels, particularly among diverse youth populations, identifying factors that contribute to physical activity should be an important focus for any health behavior research (Hays, Damush, & Clark, 2005).

## **CHAPTER II.**

### **Review of the Literature**

The purpose of this chapter is to provide a comprehensive and current review of the literature available regarding the variables of interest in order to offer support for the purpose of the study. Included is a discussion of the theoretical framework guiding the study and of the literature that provides support for the relationships between and among following concepts: (1) spirituality; (2) self-esteem; and (3) physical activity. Finally, the formulated hypotheses are listed.

A foundational search was conducted to explore existing empirical literature and identify gaps in information. The research study was framed based on extant theory and the results of the literature review. Articles were accessed using Rutgers, The State University of New Jersey, Saint Anselm College, and Walden University electronic library databases. CINAHL, PubMed, PyscINFO, Medline, EBSCO, ERIC (Education Resources Information Center), Cochrane Database of Systematic Reviews, and ATLA Religion Database were the primary database engines sourced. Search terms used both individually and in combination included: ‘spirit’, ‘spiritual’, ‘spirituality’, ‘youth’, ‘young adult’, ‘adolescent’, ‘emerging adult’, ‘health’, ‘self-esteem’ and ‘physical activity’. Additionally, ‘health promotion’, ‘health outcome’, ‘health behavior’, and ‘physical exercise’ were used to enhance the search.

Literature was reviewed using Galvan’s (2006) recommendations for literature review in the social and behavioral sciences. Primary peer-reviewed research articles from nursing and related scholarly disciplines were reviewed. The focus is on articles from within the last 10 years. To supplement the search, information from unpublished

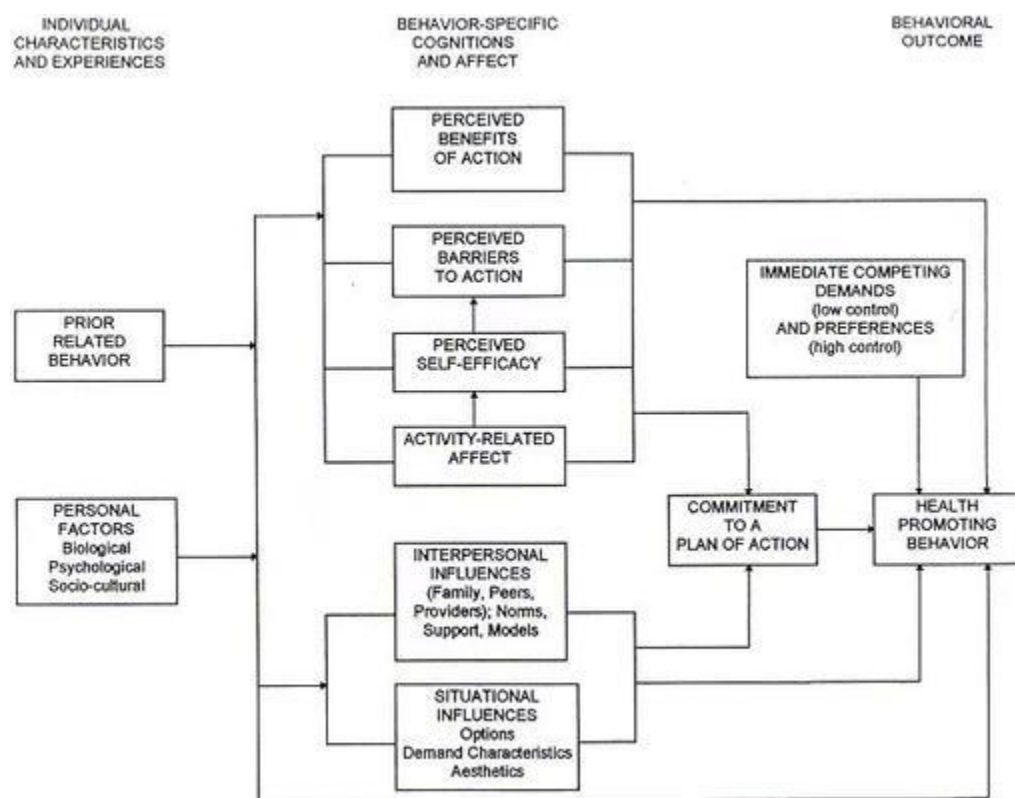
studies and reliable websites such as Institute of Medicine, the Centers for Disease Control and Prevention, the Department of Health and Human Services was explored. Article abstracts were explored for any combination of the relationships between and among spirituality, self-esteem and physical activity in the adolescent, late adolescent or emerging adult population. Articles were excluded if methods did not include a measure of spirituality, self-esteem or physical activity.

### **Theoretical Framework: The Health Promotion Model**

Pender's Health Promotion Model (HPM) is a nursing model grounded in multidisciplinary theory that has been applied to the study of adolescents. The model recognizes individual people as holistic and unique. Each person is assumed to be an active participant in the process of seeking and maintaining personal wellness. The model focuses on characteristics of an individual affecting health promoting behavior (Pender et al., 2015). Health behaviors are the outcome of individual traits and both internal and external motivators. The primary goals of health promotion are to increase well-being and self-actualization (Pender et al., 2015). The HPM is presented in Figure 1.

Pender first presented the HPM in 1982. It has been revised and refined times to “depict the multidimensional nature of persons interacting with their interpersonal and physical environments as they pursue health” (Pender et al., 2006, p. 50). Two questionnaires have been developed from the model, the Health Promoting Lifestyle (HPLP) (Walker, Sechrist & Pender, 1987) (now revised as HPLP II (Walker & Hill-Polerecky, 1996)) and the Adolescent Lifestyle Profile (Henricks et al., 2006) both of which are designed to measure domains of a health promoting and assess the effects of interventions designed to influence health outcomes. The model is grounded in two

theories, Bandura's (1985) Social Cognitive Theory and Feather's (1982) Expectancy-value theory.



*Figure 1- The Health Promotion Model*

Note: Pender, Nola J.; Murdaugh, Carolyn L.; Parsons, Mary Ann, *Health Promotion in Nursing Practice*, 7<sup>th</sup>, © 2015. Reprinted by permission of Pearson Education, Inc., New York, New York.

Social cognitive theory explains human behavior as dynamic and three fold: behavior, personal factors and environment (Baranowski, Perry, & Parcel, 2002). The three elements are interactive. Thus, human behavior is shaped by internal and external stimuli (Pender et al., 2015). Expectancy-value theory explains that behavior is motivated by perceived value and expectation of a desired outcome (Pender et al., 2015).

Pender expands on concepts developed by Bandura (1985) and Feather (1982) and highlights three major constructs: individual characteristics and experiences, behavior-specific cognition and affect and behavioral outcomes. Individual characteristics and experiences, such as personal factors, are antecedents to action. Personal factors are believed to be predictive of a given behavior. “Behavior-specific variables...are considered to have major motivational significance” (Pender et al., 2006, p. 52). These variables include perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences and situational influences. Health promotion behavior is a behavioral outcome that improves overall health. Pender et al. (2015) propose that personal factors can have both direct and indirect effects on a given health promoting behavior such that personal factors may or may not be mediated by affect impacting a health promoting behavior. Finally, the model suggests the direction and potential combination of those influences.

Pender’s Health Promotion Model was selected to guide this study for its explicit focus on positive health behaviors. Further, it has been used in the study of adolescent physical activity. To date, there are no published studies that examine the relationships between and among spirituality, self-esteem and physical activity in adolescents using the HPM as the theoretical model. It has been suggested that the model constructs do predict health promoting behavior in adolescents, but that further exploration is necessary in order to better understand how nurses might support the constructs and intervene to promote health behavior in adolescents (Strof & Velso-Friedrich, 2006). This study will explore the direct and indirect relationships among the individual characteristics/experiences (personal factor represented by spirituality), behavior-specific

cognition and affect (activity-related affect represented by self-esteem), and behavioral outcome (health promoting behavior represented by physical activity) among female adolescents participating in Wave III of the Add Health Study.

## **Empirical Support**

### **Spirituality and self-esteem.**

Six studies were found that provide empirical support for the relationship between spirituality and self-esteem in adolescents. To, Tam, Ngai & Sung (2014) explored the relationships between and among sense of meaningfulness, sources of meaning, and self-evaluation in a sample of 373 low-income Chinese adolescents. The study focuses on the relationship among four sources of meaning and two dimensions of self-evaluation. Four levels of sources of meaning were included: self-preoccupation, individualism, collectivism and self-transcendence. The levels reflect the hierarchical connection of the adolescent to the source of meaning and to purpose in life beyond self-interest. The highest three levels of sources, which reflect an intrinsic source of meaning and a building of self-awareness, and questionnaire items reveal conceptual approximation to spirituality. The Chinese version of the Sources of Meaning Questionnaire was used to measure the adolescents' perceived sources of meaning. Two dimensions of self-evaluation were included, self-efficacy and self-esteem. A translated version of the Rosenberg Self-Esteem Scale was used to assess the adolescents' self-esteem.

Zero-order correlation analysis was used to examine the correlations between presence of meaning, sources of meaning (4 levels) and self-evaluation (2 dimensions). Individualism ( $r = .19$ ), collectivism ( $r = .18$ ), and self-transcendent sources of meaning ( $r = .18$ ) were significantly correlated with self-esteem ( $p < .001$ ). The interaction of

presence of meaning and sources of meaning on self-evaluation were tested using hierarchical regression. Statistically significant ( $p < .05$ ) relationships were found between self-esteem and individual ( $r = .01$ ), collectivism ( $r = .01$ ), and self-transcendent sources of meaning ( $r = .01$ ). It is important to note that the relationship between self-efficacy and individual, collectivism and self-transcendent sources of meaning was not significant. These findings indicate that an intrinsic or personal source of meaning is related to self-esteem. Further, these findings indicate the conceptual and empirical differentiation between self-esteem and self-efficacy. Finally, these findings support the theorized relationship between spirituality and self-esteem in adolescents.

Papazisis, Nicolaou, Tsiga, Christoforou & Sapounntzi-Krepia (2014) examined the relationships between religious and spiritual beliefs, self-esteem, anxiety and depression in a sample of 110 nursing students with a median age of 20.5 years in Cyprus. Spirituality was measured using the Royal Free Interview for Religious and Spiritual Beliefs translated into Greek. Self-esteem was measured using the Rosenberg Self-Esteem Scale. Other instruments implemented through self-report include the Beck Depression Inventory II and the State-Trait Anxiety Inventory. The majority of the students (98.2%) reported high levels of religious and/or spiritual belief. Typical self-esteem levels were reported for 71.3% of students. Study findings revealed a statistically significant ( $r = 0.26, p < 0.01$ ) correlation between spirituality measured by the strength of religious and/or spiritual beliefs and self-esteem. This finding offers support for the theorized relationship between spirituality and self-esteem, but the independent relationships between religiosity and self-esteem and spirituality and self-esteem were not examined.



Haymen, Kurpius, Befort, Nicpon, Hull-Blanks et al. (2007) conducted a study to examine the relationships between spirituality, self-esteem, body image, and stress in a sample of 204 college freshmen with a mean age of 18.17 years in the United States. All of the students self-identified as being highly spiritual. The students completed series of self-report instruments. Of interest to this study are those selected to measure spirituality and self-esteem. Spirituality was measured using the self-report Faith Maturity Scale. The scale was revised by the researchers to include 20 of the 38 items focused on spiritual growth and experiences. Further, item wording was revised to replace the word “faith” with a reference to “spirituality”. The reported Cronbach’s alpha for the study sample was .95. The Rosenberg Self-Esteem Scale was used to assess global self-esteem. The reported Chronbach’s alpha for the study sample was .78.

Zero-order correlation was used to determine the relationship between spirituality and self-esteem. Spirituality was positively and statistically significantly correlated to self-esteem ( $r = .19, p = .05$ ). Furthermore, the researchers report that the correlation between spirituality and self-esteem was statistically significant ( $r = .22, p = .01$ ) for female participants but was not statistically significant for male participants. These findings support the theorized relationship between spirituality and self-esteem, and suggest that the relationship may be stronger for in the female subset or confounded by gender.

In a longitudinal study, Sallquist, Eisenberg, French, Purwono & Suryanti (2010) investigated the relationships between and among spiritual and religious experiences and socioemotional functioning in a sample of Indonesian adolescents. Participants responded at three points in time to multiple measures all of which were translated from

English to Indonesian. While the researchers hypothesized, based on the understanding that Islam is highly integrated into Indonesian culture and personal life that for the majority Muslim participants, religion and spirituality would be one construct, each construct was measured uniquely for selected points in time. Spirituality was measured using the Daily Spiritual Experiences Scale and the Brief Multidimensional Measure of Religiousness/Spirituality. Measures of spirituality were implemented only at T2 and T3. Self-esteem was measured on a scale from 1 (really not like me) to 4 (really like me) using the Cognitive Competence subscale and the Global Self-Worth subscale. Research findings indicated that while adolescent self-report of religious practices decreased over time (T2 and T3), spirituality remained stable. Further, self-esteem was statistically significantly ( $r = .22, p < .05$ ) related to spirituality at T3, but religiosity was not. Following initial correlation analyses and despite findings suggesting unique contributions from both spirituality and religiosity measures, researchers grouped the two constructs together for subsequent analyses and called the construct SR. Finally, T1 self-esteem predicted T2 SR, but the inverse relationship was not tested as measures of spirituality and religiosity were not implemented at T1. These findings support the theorized relationship between spirituality and self-esteem and seem to offer support for the measurement of spirituality as a construct unique from religiosity. Further, the relationship between spirituality and self-esteem may be reciprocal rather than unidirectional. Finally, the researchers' arguments support spirituality as an important personal element of sociocultural norms.

Weber & Kurpius (2011) examined the interrelationships among the importance of self-beliefs (i.e. self-esteem, mattering to friends, spirituality) and relational aggression

in a sample of 457 college students. Participants were between the ages of 18 and 23. Fifty-six (56) of the 457 students classified themselves as spiritual but not religious. Spirituality was measured using the Faith Maturity Scale. The word “faith” was replaced with the word “spirituality” to avoid misinterpretation of the word faith as religious faith. The reported Cronbach’s alpha for the scale was .95. Self-esteem was assessed using the Rosenberg Self-Esteem scale; the reported Cronbach’s alpha was .86. Findings revealed that spirituality and self-esteem were related ( $r = .18, p = .001$ ). Discriminant analysis revealed spirituality as the most powerful discriminator; spirituality was higher in the female participants. This study supports the theoretical relationship between spirituality and self-esteem, but was generally limited in its reporting of statistical methods and discussion.

Joshanloo & Daemi (2015) hypothesized that in a sample of 322 Iranian undergraduates with a median age of 22.03 years, self-esteem would be correlated to spirituality. Further, the researchers hypothesized that self-esteem would mediate the relationship between spirituality and measures of well-being. Two measures of spirituality were used, the Spiritual Involvement and Beliefs Scale Revised and the Spiritual Meaning Scale; the scores from both scales were transformed into z-scores then summed to create a composite index for each student (Joshanloo & Daemi, 2015). The Rosenberg Self-Esteem Scale was used to measure global self-esteem. Statistically significant gender differences were found in scores on the Spiritual Involvement and Beliefs Scale Revised with females scoring higher than males. Self-esteem and both measures of spirituality were found to be significantly correlated. Mediation analysis using a series of regression analyses revealed that spirituality explained 24.8% of the total

variance in subjective well-being, that spirituality explained 31.3% of the total variance in self-esteem, and that self-esteem explained 45.6% of the total variance in subjective well-being. The Sobel test was used to test the indirect relationship of spirituality with subjective well-being through self-esteem; the results indicated that the relationship was significant ( $z = 8.08, p < .001$ ). Hierarchical regression was used to determine if the mediation was complete or partial. Self-esteem was entered into the first block and spirituality into the second block. The results indicated that spirituality remained significant in predicting subjective well-being; the results indicate that self-esteem is a partial mediator of the relationship between spirituality and subjective well-being.

This study offers support for the theorized relationship between spirituality and self-esteem. Further, it emphasizes the nature of self-esteem as a consequence of spirituality as well as a partial mediator between spirituality and well-being constructs. Finally, the study emphasizes that gender may play a role in the aforementioned relationships.

All of the studies reviewed offer empirical support for the theorized relationship between spirituality and self-esteem. Nearly all of the research was conducted by non-nurses. While most studies selected the Rosenberg Self-Esteem Scale as the measure of global self-esteem, the studies used a variety of measures of spirituality some of which were modified from the original versions. Issues of diverse measures of spirituality persist throughout the extant (both current and historical) literature and is a common critique. Further, the studies highlight the importance of gender and race/ethnicity to the relationship between spirituality and self-esteem as well as highlight the value of measuring spiritual and religious constructs separately. The relationship between

spirituality and mental health constructs such as self-esteem has not been systematically studied in the late adolescent population (Wong, Rew & Slaikeu, 2006). In addition, negative measures of mental health (i.e. depression and anxiety) are over represented in the literature (Keyes, 2003). Research suggests that further exploration of this relationship from a holistic and positive perspective will more fully inform our understanding of late adolescent well-being (Benson, Roehlkepartain & Rude, 2003) and late adolescent achievement of stable identity as they transition to adulthood (Erikson, 1963, 1968).

### **Spirituality and physical activity.**

Four studies were found that offer empirical support for the relationship between spirituality and physical activity. Rachele, Cuddihy, Washington & McPhail (2014) explored the associations between self-reported dimensions of wellness and physical activity. Two instruments the Five-Factor Wellness Inventory and the International Physical Activity Questionnaire for Adolescents were used to gather information from the adolescent (n=324) participants. Logistic regression was used to examine the associations between physical activity and five higher order dimensions of wellness, including spirituality. Spirituality was found to have a statistically significant ( $\beta = .016$ ,  $p = .014$ ) relationship to meeting physical activity guidelines.

This study offers empirical support for the theorized relationship between spirituality and physical activity. Further, it suggests that the relationship may be circular in nature. Finally, it highlights the need for investigation of such relationships from a holistic perspective.

Nagel & Sgoutas-Emch (2007) examined the relationships between health beliefs, behaviors and spirituality in a population of 364 young, healthy undergraduates. The majority of the 364 participants were female (81%), Caucasian (69.9%), and Catholic (46.4%). Students responded to a series of self-report instruments including the Index of Core Spiritual Experiences ( $\alpha = .80$ ), the Health Promoting Lifestyle Questionnaire ( $\alpha = .88$ ), and the Health Beliefs Questionnaires I and II ( $\alpha = .85$ ). Correlation and regression analyses revealed that the Index of Core Spiritual Experiences questionnaire was significantly ( $r = .135, p < .05$ ) related to physical activity. Further, participants scoring in the upper 30% (or high spirituality) of respondents on the Index of Core Spiritual Experiences were more likely than the low (bottom 30%) spirituality group to be more physically active. Some findings indicate that the strength of relationships between religious, spiritual, health beliefs and health behavior variables vary when including for gender and ethnicity. Caucasians were found to be more spiritual when compared to non-Caucasians. Males were more likely than females to participate in health risk behaviors.

This study offers empirical support for the theorized relationship between spirituality and physical activity. It emphasizes the importance of focusing on exploring the relationship in healthy individuals rather than in patient populations. Finally, it highlights the need to measure religion and spirituality separately and to include ethnicity and gender in comparisons.

In a descriptive, qualitative study, Ramanathan & Crocker (2009) interviewed six female adolescents of the Indian diaspora (direct immigrants from India and the Indian subcontinent living in Canada) ranging in age from 15 to 19 years old. Participants were recruited from a spiritual center. The young women were asked to respond to four open-

ended questions exploring involvement in physical activity, gender roles, parental influence and culture, values and ethnic heritage. Spirituality emerged as an important influence on physical activity. Further, one participant suggested that remaining close to her spiritual self (as opposed to identification with a specific religious faith) was the best characterization of her relationship to her culture. Finally, participants shared that participation in meditative physical activities such as walking were complementary to spirituality.

This study offers empirical support for the theorized relationship between spirituality and physical activity. The participants emphasized the essential role of spirituality to physical activity and overall physical health. Further, it was suggested that the relationship between spirituality and physical activity rather than being unidirectional may be circular in nature. Finally, the essential nature of spirituality to female adolescents and to cultural identity were vital to several thematic categories.

Raj, Senjam & Singh (2013) report findings from a pilot study designed to ascertain the relationships between health promoting behaviors and lifestyle among a sample of 50 university students ranging in age from 17 to 20 years, living in India. Participants responded to a self-report questionnaire developed by the researchers comprised of 28 items. Items were scored on a Likert type scale ranging from 1 to 4 indicating frequencies ranging from 'never' to 'routinely'. Chi-square analyses revealed that most study participants engaged in some physical activity and most were spiritual. Even though the researchers intimate an association between spirituality and physical activity, multivariate analyses were not used to explore the relationships between variables of interest.

The pilot study offers general support for the relationship between spirituality and physical activity. Researchers suggest that further studies are needed to more fully explore the relationships among the variables of interest. The suggestion that topics related to spirituality and physical activity be incorporated into the information and education provided to adolescents is made.

All of the studies reviewed offer empirical support for the theorized relationship between spirituality and physical activity. Each of the articles was unique in terms of theoretical framework, sample characteristics, methodology, and measurement which is a common criticism of research studies examining these variables (Rew & Wong, 2006). None were written from a nursing perspective. While diversity among the articles is clear, all of the studies highlight the potential importance of gender and culture to the relationship between spirituality and physical activity as well as highlight the possibility that the relationship is circular rather than unidirectional in nature. The relationship between spirituality and physical activity has not been systematically studied in the healthy late adolescent population, though the extant research certainly suggests that the relationship is a positive one (Rew & Wong, 2006). Research suggests that further exploration of this relationship from an organized theoretical perspective will more fully inform our understanding of the complexities of late adolescent behavior and it correlates (Rew & Wong, 2006).

### **Self-esteem and physical activity.**

Seven studies were found that offer empirical support for the relationship between self-esteem and physical activity. Faulkner, Adlaf, Irving, Allison, Dwyer et al. (2007) examined the relationships among physical activity, self-esteem and delinquent behaviors



among a large ( $N = 3,796$ ) sample of adolescents ranging in age from 11 – 20 years of age. The researchers posited that self-esteem might mediate the relationship between physical activity and delinquency. Self-esteem was measured using a modified version (six-items) of the Rosenberg Self-Esteem scale; physical activity was measured by asking participants to recall their participation in a variety of activities over the last week. While self-esteem was not found to mediate the relationship between physical activity and delinquency, self-esteem was positively and statistically significantly related to physical activity ( $r = .16, p < .001$ ) and was negatively correlated with delinquency ( $r = -.13, p < .001$ ).

The cross-sectional study offers general support for the relationship between self-esteem and physical activity in a large sample of youth. The relationship between constructs remained significant when controlling for gender and age. Self-esteem was not found to mediate the relationship between physical activity and delinquency, rather was found to have unique correlation with each of the constructs which offers support for the influence of self-esteem as a distinct construct. Finally, this study underscores the more common exploration of self-esteem and physical activity from a health risk rather than health promotion perspective.

Using Waves I and II of the Add Health data set, Nelson & Gordon-Larsen (2006), explored the associations between physical activity, sedentary behavior and health risk behaviors (including level of self-esteem). The sample of 11, 957 adolescents with an average age of 15.8 ( $\pm 11.6$ ) years was grouped into 7 activity related clusters. Self-esteem was measured using 6 items modified from or similar to the Rosenberg Self-

Esteem scale. Self-esteem was then dichotomized into a measure of “low” or below median for analyses.

Analyses of self-esteem were conducted separately by gender and covariates of race/ethnicity and socioeconomic status were measured. Results were reported as adjusted risk ratios. Results indicated that independent of demographics and socioeconomic status, the relationship between physical activity patterns and self-esteem varied little by gender. Researchers reported that engagement in a diverse range of physical activities was associated with less risk of low self-esteem.

This study offers empirical support for the relationship between self-esteem and physical activity. Researchers conclude that the study offers support for the relationship between physical activity and mental health characteristics such as self-esteem. Of importance is the finding that engagement in a diverse range of physical activities is associated with higher self-esteem. Nelson & Gordon-Larsen (2006) discussed all findings from a risk behavior perspective rather than from a health promotion perspective, as highlighted by the decision to dichotomize self-esteem into a measure of “low” or below median self-esteem.

Kristjansson, Sigfusdottir & Allegrante (2010) tested a structural equation model to estimate the relationships between health behaviors, body mass index, and self-esteem and academic achievement in a cross-sectional sample of 6,346 Icelandic youth between 14 and 15 years of age. Researchers posited that positive affective states, such as high self-esteem, confer health benefits. Self-esteem was measured with five items from the Rosenberg Self-Esteem Scale; physical activity was measured on a scale of 1 to 6 indicating a range of participation from almost never to almost every day.

Zero-order correlation revealed that self-esteem and physical activity were correlated ( $r = .22, p < .01$ ). The structural equation model showed that self-esteem was positively influenced by physical activity, this is, physical activity had a strong and direct relationship with self-esteem ( $\beta = .16, t > 1.96$ ). Finally, researchers conclude that theoretically and methodologically the relationships between mental and physical health are complex and underscore the direct and indirect influence of self-esteem on health behaviors.

This study offers empirical support for the relationship between self-esteem and physical activity. Importantly, it discusses the complexity of the direction of the relationship between self-esteem and physical activity. Finally, it offers support for the understanding of self-esteem as a positive affective state and for the focus on positive health behaviors rather than risk behaviors.

Wood, Angus, Pretty, Sandercock & Barton (2013) report findings from a randomized control trial of physical activity in a perceived environment on self-esteem and mood in a sample of 25 healthy adolescents. The purpose of the study was to analyze the effects of physical activity while viewing natural and built environments on adolescent self-esteem and mood. Researchers hypothesized that adolescents would viewing scenes of natural (rather than built) environments would show larger gains in self-esteem. Participants completed physical activity on cycle ergometers while viewing either an all green or natural space or a space comprised of all buildings and no green space. Immediately before and directly following the 10 minute cycle, participants completed the Rosenberg Self-Esteem Scale.

Mixed ANOVA results indicated that environmental scene viewing had no impact on self-esteem, but indicated that physical activity alone had a significant main effect on self-esteem ( $F = 6.10, p < .05$ ). No gender differences in self-esteem were noted. Researchers also noted the relatively moderate intensity of the activity in term of heart rate reserve (50%) and time (10 minute intervals).

Findings offer empirical support for the relationship between self-esteem and physical activity. While male participants were more physically fit when compared to female participants, no gender differences in the relationship between self-esteem and physical activity were noted. Finally, findings emphasizes that the “dose” or intensity of physical activity may not contribute to the strength of the relationship between self-esteem and physical activity.

Kahn, Huang, Gillman, Field, Austin et al. (2008) described longitudinal patterns and determinants in U.S. adolescent physical activity. Multiple factors including but not limited to individual characteristics (i.e. gender), psychosocial factors (i.e. self-esteem), peer and familial factors were explored in relationship to physical activity levels over time and as part of the Growing Up Today Study of offspring of female nurses participating in the Nurses’ Health Study II. Of interest to the current study are the reported findings related to self-esteem and physical activity.

Participants ranged in age from 10 years old to 18 years old and self-reported information at three points in time. They responded to a youth specific physical activity measure developed by the researchers which assessed hours of participation in a variety of physical activities over each season of the previous year. Self-esteem was assessed using a global self-esteem scale consisting of four sub scales (athletic, social, scholastic,

and global). Separate multivariable analyses were conducted for males ( $n = 5,575$ ) and females ( $n = 7,237$ ).

While males reported a higher number of hours of physical activity when compared to females, findings for both boys and girls suggested that some measures of self-esteem were associated with physical activity at baseline. The athletic subscales of the global self-esteem measure for boys ( $\beta = .095$ ), and girls ( $\beta = .083$ , (girls),  $p < .0001$ ) and the social self-esteem subscales for boys ( $\beta = .022$ ) and girls ( $\beta = .023$ ,  $p < .0001$ ) were significantly related to physical activity. Researchers emphasized the importance this finding may have on interventions aimed at improving rates of physical activity in young people. It is suggested that interventions designed to promote physical activity may improve self-esteem; furthermore, with improved self-esteem rates of physical activity may increase. Despite the extensive discussion of the relationship between self-esteem and physical activity and its potential implications for practice, researchers reported that age was the only factor associated with change in physical activity over time and indicated that physical activity, best modeled as a quadratic function of age, declines in both boys and girls after age 13.

This study offers empirical support for the theorized relationship between self-esteem and physical activity. It emphasizes the importance of including age and gender in analyses. Further, it underscores the potentially circular nature of the relationship between self-esteem and physical activity. Finally, it highlights the value of understanding the relationship between self-esteem and physical activity in order to encourage youth centered interventions.

In a descriptive study, Birkeland, Melkevik, Holsen, & Wold (2012) reported findings designed to explore global self-esteem change over time and its correlates in a sample of participants between the ages of 14 and 23 years. Global self-esteem was measured using a revised version of Rosenberg's Self-Esteem Scale. Physical activity was measured by the number of times per week that an adolescent participated in activity that resulted in sweatiness or breathlessness. Results indicated statistically significant relationships between global self-esteem and physical activity at all six measurement points in time. Global self-esteem at ages 14 ( $r = .010, p < .01$ ), 15 ( $r = .14, p < .01$ ), 18 ( $r = .10, p < .05$ ), 21 ( $r = .13, p < .01$ ), and 23 ( $r = .12, p < .01$ ) years of age were all found to be correlated with physical activity.

This study offers empirical support for the theorized relationship between self-esteem and physical activity. The study is generally limited in its discussion of findings and in detailed discussion of instrumentation. It does however suggest that physical activity is an early and lasting correlate of self-esteem. Researchers suggest that self-esteem is related to participation in physical activity, but may also be an outcome of physical activity. This suggestion highlights the possibility that the relationship may be circular rather than linear.

Schmaltz, Deane, Birch & Davison (2007) reported findings from a longitudinal study designed to explore the lagged effect of physical activity on self-esteem and of self-esteem on physical activity in a sample of 197 non-Hispanic white girls at three points in time, ages 9, 11, and 13 years. Three measures of physical activity were assessed: 1) Children's Physical Activity scale; 2) participation in team sport and organize activities checklist, and the 3) Progressive Aerobic Cardiovascular Endurance Run. A summary

score was created from the three measures using principal component analysis. Self-esteem was measured using the Self-Perception Profile for Children.

Researchers used an individual growth model to examine the lagged effect of physical activity on self-esteem and self-esteem on physical activity. Results indicated that higher self-esteem at ages 9 and 11 years was not associated with higher physical activity at ages 11 and 13 years. However, higher participation in physical activity at ages 9 and 11 years predicted higher self-esteem at ages 11 and 13 years. This relationship was modified by age and BMI which suggested that the strength of the effect of physical activity on self-esteem was stronger for participants who were younger and more overweight.

This study offers empirical support for the theorized relationship between self-esteem and physical activity. It is the only study to suggest that the relationship is unidirectional, that is that self-esteem is an outcome of physical activity. This suggestion must be considered carefully in light of several study characteristics. The study included only middle class non-Hispanic white girls, who were pre-adolescent, rather than adolescent at the beginning of the study and who self-reported high levels of self-esteem and moderate levels of physical activity.

All of the studies reviewed offer empirical support for the theorized relationship between self-esteem and physical activity. Most (all but two) assessed self-esteem using some version of the Rosenberg Self-Esteem scale. It is important to note that measure of physical activity, participant ages, control for participant gender and socioeconomic status varied which is a common criticism when evaluating findings across studies (Hallal et al., 2006). All of the studies suggest the potential importance of gender, age and

socioeconomic status to the relationship between self-esteem and physical activity, though not all report significant findings in the aforementioned characteristics. Nearly all results suggest the possibility that the relationship between self-esteem and physical activity is circular rather than unidirectional in nature, indicating that interventions may be aimed at increasing positive psychology (Biddle et al., 2005) or at opportunity for physical activity. However, none offered clear theoretical underpinning, adding to confusion about the direction of the relationship between self-esteem and physical activity. None were written from a nursing perspective. The correlation between mental health constructs such as self-esteem and health promoting behaviors such as physical activity is underrepresented in current nursing literature when compared to literature exploring the relationship between mental health and risk behaviors (Wong et al., 2006). Even more limited is the literature examining such relationships in the late adolescent or emerging adult female population (Biddle et al., 2005; Sirard & Barr-Anderson, 2008).

**Self-esteem as intervening on relationship between spirituality and physical activity.**

While data from one study (Joshanloo & Daemi, 2015), suggests that self-esteem mediated the relationship between spirituality and subjective well-being, a review of the literature found no studies that explored self-esteem as a mediator of the relationship between spirituality and physical activity. As part of their development of a framework for exploring adolescent wellness, Spurr, Bally, Ogenchuk and Walker (2012) explored the relationship between subjective wellness or well-being and four dimensions: spiritual, physical, social and psychological. Of interest to the current study are the spiritual, physical and psychological dimensions. The researchers explain that the spiritual



dimension includes adolescent's personal values and beliefs. They further discuss that the physical dimension includes components of physical development such as physical activity. Finally, the psychological dimension is made up of self-esteem and self-concept.

A purposeful sample of 280 participants ranging in age from 16 to 20 years responded to self-report Adolescent Wellness Surveys (AWS). The survey was divided into the four dimensions: spiritual, psychological, social, and physical and included a total of 63 items. The reported Cronbach's alpha for the physical scale was .67. Cronbach's alphas for the remaining three dimensions ranged from .86 to .92. Additionally, participants were asked two questions relating to their overall wellness. The two questions about wellness were used to create a composite wellness score. Statistically significant correlations were reported between the wellness composite score and physical activity ( $r = .55, p < .01$ ), the wellness composite score and spirituality ( $r$  values ranging from .16 to .19), and the wellness composite score and self-esteem ( $r = .30, p < .01$ ).

This study offers support for the theorized relationships among spirituality, self-esteem, and physical activity. However, the study only intimates the relationships among the three constructs, as it only actually correlated each construct individually to a composite wellness score. The study highlights the need for further research with a positive lens and holistic perspective. Finally, it is the only study written from the nursing perspective that includes each of the concepts of interest.

The literature does support the relationships between spirituality and self-esteem, spirituality and physical activity and self-esteem and physical activity as theorized by the

HPM. Krause et al. (2010) and MacKinnon et al. (2002) suggest that intervening variables transmit the effect of an independent variable to the dependent variable. A review of the literature suggests that behavior specific cognitions and affect specifically, activity related affect (self-esteem), may intervene in the relationship between individual characteristics and experiences, specifically personal factors (spirituality) and behavioral outcomes, specifically health promoting behavior (physical activity). The empirical literature reveals a relationship between spirituality and self-esteem as well as between self-esteem and physical activity. Congruent with the HPM, these relationships suggest that self-esteem may mediate the relationship between spirituality and physical activity. An exploration of self-esteem as a mediator in this study will help to clarify its importance to the relationship between spirituality and physical activity.

### **Theoretical rational**

The HPM stipulates that individual characteristics and experiences (personal factors i.e. spirituality) as well as behavior-specific cognitions and affect (activity-related affect i.e. self-esteem) influence behavioral outcomes (health promoting behavior i.e. physical activity). According to Pender et al. (2015), personal factors can have both a direct and indirect effects on health promoting behavior. The HPM proposes that the relationship between personal factors (spirituality) and health promoting behavior (physical activity) may be intervened upon by activity-related affect (self-esteem). Based on these theoretical propositions, the following hypotheses have been derived and were tested:

### **Hypotheses**

Hypothesis #1 - Spirituality will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents.

Spirituality  $\xrightarrow{+}$  Physical activity

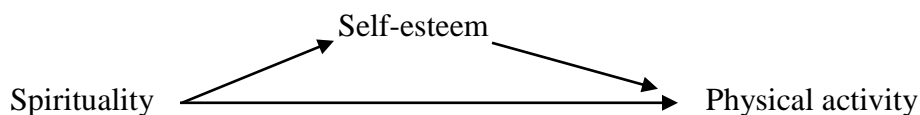
Hypothesis #2 - Spirituality will have a positive relationship to self-esteem among late adolescent and young adult female respondents.

Spirituality  $\xrightarrow{+}$  Self-esteem

Hypothesis #3 - Self-esteem will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents.

Self-esteem  $\xrightarrow{+}$  Physical activity

Hypothesis #4 – Self-esteem will intervene on the relationship between spirituality and participation in physical activity among late adolescent and young adult female respondents.



#### D. Summary

Pender's HPM offers theoretical support for a holistic understanding of the relationships among spirituality, self-esteem and the participation in physical activity among late adolescent and young adult females. There is relatively little empirical research exploring the complexities of these relationships when compared to the extensive literature emerging from numerous disciplines exploring the meaning and significance of each of the constructs individually. Despite nursing's holistic and health promoting foci, there is a paucity of literature from a nursing perspective. A thorough review of current literature from a variety of disciplines reveals dramatic variation,

presumably related to lack of explicit theoretical underpinning, in methodology, conceptual and operation definitions, and measurement. Despite the diversity of perspectives, research suggests that participant age, gender and culture/ethnicity may play a role in the relationships between and among spirituality, self-esteem, and physical activity.

## **CHAPTER III.**

### **Methods**

The purpose of this chapter is to summarize the data set selected, describe the research design for this study including the setting, sample, the instruments, the procedure for data collection, and the data analysis. Finally, power analyses are reported. To explore the relationships between spirituality, self-esteem, and physical activity among late adolescent and young adult females, this study uses a descriptive, correlational research design. Wave III publically available data of the Adolescent Health (Add Health) Survey was used.

#### **Summary of Data Set**

The National Longitudinal Survey of Adolescent to Adult Health (Add Health) is a nationally representative sample of U.S. adolescents in grades 7 through 12, first conducted during the 1994-1995 school year. Add Health originally surveyed over 90,000 students from 132 schools in 80 different communities. In this study, the Wave III public use subset of this data was used and includes 4,882 of those adolescents who range in age from 17 to 26 years old. Wave III seeks to explore on how adolescent experiences and behaviors inform decisions (Carolina Population Center; 2016), behavior, and health outcomes during the transition to adulthood while considering the context of various social, familial and educational environments.

Add Health data was selected for this study given its methodological strengths, such as population representativeness and data collection, and explicit focus on health outcomes. Further, questions surrounding health outcomes include questions related to positive health outcomes rather than focusing on disease processes. Wave III data,

collected in 2001, was used for this study as each member of the population surveyed had reached adolescence and had begun the transition to adulthood (respondents range in age from 17 to 26) an age range critical to the establishment of behaviors and lifestyle choices (Hendricks et al., 2006) and to emerging independent spiritual maturity. Further, the variables of interest including spirituality, self-esteem and physical activity were represented in questionnaire items.

Of relevance to the current study was the fact that Wave III questions related to religion and spirituality allowed for distinct understandings of the concepts. This affirms that survey developers paid close attention to the fact that virtually all extant research relies on measures of religion rather than spirituality (Benson et al., 2003; George, Larson, Koenig, & McCullough, 2000) and deliberately allowed for a more clear delineation of measure of each of the concepts. Wave III of Add Health did not rely on measures of religious affiliation or religious attendance (the most commonly used measures (Rew & Wong, 2006)), which in the adolescent population may be more reflective of parental control and perspective (Brown, 2001; Rew & Wong, 2006) rather than of the transition to increasingly independent multifaceted thinking (Benson, 2004; Benson, et al., 2003; Cotton, McGrady, & Rosenthal, 2010), to measure spirituality. Further, participants were presented with both the question “to what extent are you a religious person” and the question “to what extent are you a spiritual person” on their lap tops at the same time allowing for the possibility that a participant might be spiritual and not religious (Hill et al., 2000), a population that is both increasing and underrepresented in research (George et al., 2000).

### **Research Setting and Sample**

This study utilized Wave III of the Add Health, which is the 6<sup>th</sup> year follow up of Wave I participants. Participating in Wave III are 15,197 of the over 20,000 Wave I nationally representative sample. Similar to Wave I, Wave III data were collected using in-home interviews. Data from the publically available subset includes 4,882 participants; these participants are included in this study ( $N = 4,882$ ). Of particular interest to this study were the 2,445 female participants ( $n = 2,445$ ). To maintain a power of .80 and an alpha of .05 a G\*power calculation reported a sample size of 76 is necessary to detect a medium effect size.

### **Protection of Participants' Rights.**

All data used in this study is publically available through the Carolina Population Center. The precautions taken to protect participants' rights include signed informed consent, and no participant identifiers or links to identifiers (CPC, 2016). Additionally, the public data does not contain files from which personal information might be deduced including but not limited to: obesity and neighborhood environment, genetics, disposition, and political context (CPC, 2016). Given the public nature of this data no contracts were required.

This study was submitted to the Institutional Review Board (IRB) of Rutgers, The State University of New Jersey for review of the protection of participant's rights. There are no anticipated risks to participants in the study, given the selection of secondary analysis. No participant identifiers are linked to question responses. All data analyzed is publically available. Exempt status has been granted to this study (Study # Pro20150002696).

### **Instruments/Measures**

Thirty-six sections are included in the Wave III study. The self-report survey questions use Likert rating systems. Of interest for this study were questions from three sections: daily activities, social psychology and mental health, and religion and spirituality. Given the absence of any published information regarding the reliability and validity for the three sections of interest, it seems reasonable to presume that specific Wave III questions met the same standards as reported for Wave I. Seiving et al. (2009) report that instruments were constructed deductively based on known aspects of the concepts under investigation rather than through the use of factor analysis. For this sample, the alpha coefficient for the 5-item physical activity scale was .684 and approximated reported alpha for the physical activity subscale of the health promoting lifestyle profile (HPLP) (Walker et al., 1987) and exceeds the reported alpha (0.64) for the adolescent HPLP (Hendricks et al., 2006). The alpha coefficient for the 5-item self-esteem scale was .705 and approximated reported reliabilities for the Rosenberg (1965) self-esteem scale. The alpha coefficient for the 2-item spirituality scale was .820.

**Dependent variable: behavioral outcome, health promoting behavior = physical activity.**

The dependent (physical activity) variable in the study was selected from among 45 Add Health questions reflecting participant's estimations of their daily physical activity. A total of 6 items were selected to include information beyond organized sports, representative of the range of physical activity from leisure to vigorous levels and were based on literature review and personal communication with a content expert. Each of the questions asked, "In the past seven days, how many times did you..." Items specifically included the following; bicycle, skateboard, dance, hike, hunt, or do yard



work; participate in strenuous team sports such as football, soccer, basketball, lacrosse, rugby, field hockey, or ice hockey; participate in individual sports such as running, wrestling, swimming, cross-country skiing, cycle racing, or martial arts; participate in gymnastics, weight lifting, or strength training; play golf, go fishing or bowling, or play softball or baseball; or walk for exercise? Each of these responses ranged from 0 = “not at all” to 7 = “7 or more times.” None of the 6 items needed to be recoded and all of the items were recorded at the same level of measurement (0-7).

To determine if the items were consistent enough to be grouped together in a scale for the measurement of physical activity, a Cronbach’s alpha for reliability was run. The Cronbach’s alpha was .670. One item initially assessed to be included was removed given a low item-to-total correlation and given that the question was determined to be conceptually similar to others on the scale. A scale was then created by taking these 5 items summing and dividing by the number of items. The Cronbach’s alpha of the revised scale was .684, which reflects modest reliability (Nunnally & Bernstein, 1994) and approximates reported alpha for the physical activity subscale of the health promoting lifestyle profile (HPLP) (Walker et al., 1987) and exceeds the reported alpha (0.64) for the adolescent HPLP (Hendricks et al., 2006).

**Intervening variable: behavior specific cognition and affect, activity-related affect = self-esteem.**

The intervening (self-esteem) variable in the study was selected from among 27 Add Health questions reflecting participant’s estimations of their mental health. A total of 7 items were selected based on literature review and personal communication with a content expert. The first question asked respondents, “In the past 12 months, how often

have you laughed a lot?” Responses ranged from 0 = never to 4 = every day. The second asked respondents, “How satisfied are you with your life as a whole?” Responses ranged from 0= very satisfied to 4= very dissatisfied. This item was reverse coded so that higher numbers indicate more satisfaction. The third question asked respondents, whether they “enjoyed life, during the past seven days”. Responses ranged from 0 = never or rarely to 3 = most of the time or all of the time. The fourth asked respondents, “Do you agree or disagree that you have many good qualities”? Responses ranged from 0 = strongly agree to 4 = strongly disagree. These items were reverse coded so that higher numbers indicate more agreeable responses.

The fifth question asked, “Do you agree or disagree that you have a lot to be proud of?” Responses ranged from 0= strongly agree to 4= strongly disagree. This item was reverse coded, so that higher numbers indicate more agreeable responses. The sixth question asked respondents, “Do you agree or disagree that you like yourself just the way you are?” Responses ranged from 0 = strongly agree to 4 = strongly disagree. Responses were reverse coded to indicate higher numbers meaning more agreeable. The last question asked respondents, “Do you agree or disagree that you feel you are doing things just about right?” Responses ranged from 0 = strongly agree to; 4 = strongly disagree. This item was reverse coded so that higher numbers indicate more agreeable responses.

The 7 items have different levels of measurement and were standardized by obtaining the z-scores by setting the mean at 0 and the standard deviation at 1. To determine if the items were consistent enough to be grouped together in a scale for the measurement of self-esteem, a Cronbach’s alpha for reliability was run. The initial Cronbach’s alpha was .680, indicating a moderately strong consistency among the 7

items (Tavakol & Dennick, 2011). Close evaluation of both the principal component analysis using Varimax rotation and item-to-total statistics revealed that two items did not score well in either the Eigenvalue or item-to-total score. One item, “In the past 12 months, how often have you laughed a lot?” was removed, given both its Eigenvalue and its conceptual difference from the rest of the scale. A second item, “enjoyed life, during the past seven days,” was removed given its conceptual similarity to other scale items and its low item-to-total score. A scale was created by taking the 5 items, summing, and dividing by the number of items. The resulting scale is similar to the Rosenberg (1965) Self-Esteem scale, but focuses on global positive directed questions. The Cronbach’s alpha for the revised scale was .705 indicating modest reliability (Nunnally & Bernstein, 1994) and approximated reported reliabilities for the Rosenberg (1965) scale.

**Independent variable: individual characteristics and experiences, personal factor = spirituality.**

The independent variable (spirituality) in the study was selected from among 42 Add Health questions reflecting participant’s estimations of their religiosity and spirituality. A total of 3 items were selected based on literature review and personal communication with a content expert. The first item asked respondents, “How important is your spiritual life to you?” Responses ranged from 0 = not important to 3 = more important than anything else. The second item asked respondents, “What seem to be coincidences in my life are not really coincidences; I am being “led” spiritually.” Responses ranged from 0= strongly agree to 4 = strongly disagree. These items were then reverse coded so that higher items indicate more agreeable responses. The last item asked respondents, “To what extent are you a spiritual person?” Responses ranged from

0 = not spiritual at all to 2 = very spiritual. The 3 items have different levels of measurement and were standardized by obtaining the z-scores by setting the mean at 0 and the standard deviation at 1.

To determine if the items were consistent enough to be grouped together in a scale for the measurement of spirituality, a Cronbach's alpha for reliability was run. An initial Cronbach's alpha was .750, indicating strong consistency among the 3 items (Tavakol & Dennick, 2011). Close evaluation of the item-to-total scores revealed that the second item, "What seem to be coincidences in my life are not really coincidences; I am being "led" spiritually," had a low item-to-total score when compared with the two other items. Literature suggests that from a cognitive standpoint, the item may require abstract thinking and may not yet be developmentally appropriate for late adolescents and young adults (Benson & Roehlkepartain, 2008; Cotton et al., 2010). Furthermore, the two remaining items reflect a focus on salience of belief, which has been shown to be more related to beneficial outcomes in late adolescents and young adults when compared to other measures of spirituality (Yonker et al., 2012). Given the empirical evidence, this item was removed. Thus, a scale was created by taking these 2 items, summing, and dividing by the number of items. The Cronbach's alpha for the revised scale was .820 indicating strong reliability (Tavakol & Dennick, 2011).

Table 1  
*Study Scales: Internal Consistency Values*  
*(Cronbach  $\alpha$ )*

Scale	$\alpha$
Physical Activity scale	0.684
Spirituality scale	0.820
Self-Esteem scale	0.705

### **Control Variables**

Finally, the control variables included: race, gender, age and socio-economic status (SES). Race was dummy coded to include 3 separate variables (Black, Hispanic, and White). Gender (0 = male or 1 = female) were dummy coded. Age was computed by subtracting the respondents' birth year from the year of the survey. Socio-economic status was measured by total personal income before taxes, participants selected from a range of incomes on a scale from 1 - 8. Personal rather than household income was selected given that approximately 75% of respondents did not answer the household income question. The mean income was 2.14 or 10,000-15,000 dollars.

### **Data Collection**

The publically available subset of the original data used in this study is publically available through the Carolina Population Center website. Prior to data collection, all Wave III participants read and signed informed consent forms (CPC, 2016). All information was recorded onto laptop computers without hard copies. Interviewers asked more general questions first and progressed to more sensitive questions; the more general question responses were asked and recorded by the interviewer while more sensitive questions were read and recorded directly by the participant. The in-home interviews for Wave III averaged 134 minutes in length (Harris et al., 2008). The in-home questionnaire gathered information in 36 sections including but not limited to: overview and demographic information, mentoring, civic participation and citizenship, religion and spirituality, social psychology and mental health, and daily activities. Sections 12 (social

psychology and mental health), 31 (religion and spirituality), and 33 (daily activities) are of particular interest to this study.

### **Plan for Data Analysis**

Data was downloaded from the Carolina Population Center in Statistical Package for Social Sciences (SPSS) format. Statistical analyses were carried out with SPSS version 22 and STATA for Tobit regressions. A descriptive analysis, including means and standard deviations, of the demographic data was conducted to describe the sample characteristics. The statistical technique that was applied in this study is Tobit regression. Tobit regression was be utilized to generate four models that predict physical activity on spirituality, physical activity on self-esteem, self-esteem on spirituality and the joint significances of spirituality and self-esteem on physical activity to be within the specified range. A  $p$  value of  $\geq 0.05$  was be considered statistically significant.

All analyses were conducted using the 2,445 female participants in the publically available data for Wave III. Throughout the analysis, weights were not applied. No weights are available for the publically available data set. Weighting the set would have required using log for each of the items, given the number of zeros used as part of the item survey scoring, standard error would be introduced, this would further complicate the issue of weighting and the use of ordinary least squares (OLS). Moreover, given the selection of a special subset of the population weights are likely unnecessary. Finally, Winship and Radbill (1994) argue that if the model is originally homoscedastic, using weights changes the model by transforming it from homoscedastic to heteroscedastic. Because of this, it is not recommended to use weighting (DeMaris, 2004, p. 211-12; DuMouchel & Duncan, 1983).

Pender's HPM theorizes a linear relationship among spirituality, self-esteem, and physical activity. The theory presents both a direct and indirect, through self-esteem, relationship between spirituality and physical activity suggesting a three variable system and two causal paths both of which are posited to be significant. Both theory and empirical literature suggest there is a direct impact of the IV (spirituality) on the outcome variable (physical activity), but there is also a path from the IV to the intervening variable (self-esteem) and from the intervening variable to the outcome variable. Ordinary least squares (OLS) regression or multiple regression is used to investigate the linear relationship among a number of independent variables on one dependent variable (Pagano & Gauvreau, 2000). OLS assumes normal distribution of the dependent variable. The study variables were assessed for normal distribution. The dependent variable of interest in this study was physical activity. Physical activity was coded from 0 – 7 with a mean of .54 and a standard deviation of .85. This indicated that the dependent variable in this study was highly left skewed. To account for physical activity being not normally distributed, a sensitivity analysis of Tobit regression was run to assess the reliability of the OLS findings.

Tobit regression is intended for continuous data that are censored or bounded at a limiting value (DeMaris, 2004), as in this study where the dependent variable is highly left skewed. For measures of self-reported offending in the Add Health data, there may be some response measures (e.g., measures of physical activity) that are not sensitive enough to pick up lower levels of the construct, more physical activity. For example, if the respondent participates in some form of physical activity, but this is not asked in a set of items pertaining to that activity, the respondent will be coded 0 on physical activity despite having engaged in the behavior.

Likewise, if a respondent has participated in some level of physical activity, perhaps as part of a daily routine rather than a more scheduled event, and is not questioned directly it would not be detected by the physical activity measures available in the Add Health data. Since the goal is to examine the full construct of those who are participating in physical activity, then it would not be appropriate to only apply OLS. Coefficients from OLS will tend to be downwardly biased for the true effects of the regressors on the response. Tobit regression provides unbiased estimates of regressor effects on the true underlying construct of interest (Breen, 1996; DeMaris, 2004).

The first set of analyses addressed Hypothesis 1: Spirituality will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents. The positive direction of this hypothesis was derived from the theoretical proposition that inherited and acquired characteristics influence enactment of health-promoting behavior (Pender et al., 2006). To test this question, Tobit regression was used.

The second hypothesis, spirituality will have a positive relationship to self-esteem among late adolescent and young adult female respondents, was tested using Tobit regression. The positive direction of this hypothesis was derived from the theoretical proposition that inherited and acquired characteristics influence affect (Pender et al., 2006).

The third hypothesis was self-esteem will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents. This hypothesis was derived from two theoretical propositions. The first proposition states that perceived competence garnered from self-esteem to execute a given behavior increases the likelihood of actual performance of the behavior (Pender et



al., 2006). Finally, when positive emotions or affect are associated with a behavior, the probability of commitment and action is increased. The third hypothesis was tested using Tobit regression.

Finally, the fourth hypothesis explored the totality of the aforementioned propositions, self-esteem will intervene on the relationship between spirituality and participation in physical activity. An intervening variable is presumed to influence the relationship between the independent and the dependent variables (MacKinnon et al., 2002). Test of intervening variable effects are important to explore the plausibility of causal sequences implied by theory (MacKinnon et al., 2002, p.16) and as presented in the HPM. This hypotheses was tested using Tobit regression. In this step, joint significance will be examined to evaluate jointly the effects from both spirituality and self-esteem on physical activity.

The test of joint significance or the joint significance test of  $\alpha$  and  $\beta$  (Cohen & Cohen, 1983) is a causal steps approach to testing mediation using a series of regression models to determine relationships among variables (Krause et al., 2010). Specifically, the test of joint significance will explore if spirituality is related to self-esteem by predicting self-esteem from spirituality and if self-esteem is related to physical activity by predicting physical activity from self-esteem while including spirituality as a predictor. If the two paths are jointly significant than mediation exists (Krause et al., 2010: MacKinnon et al., 2002). The test of joint significance is considered the strongest test of mediation and other intervening variable effects given its balance of Type I error and statistical power as well as its computational ease and versatility of use (Krause et al., 2010: MacKinnon et al., 2002).

## CHAPTER IV.

### Analysis of the data

The purpose of this study was to explore the relationships among spirituality, self-esteem and participation in physical activity among late adolescent and young adult females. Publically available data was accessed from Wave III of The National Longitudinal Survey of Adolescent to Adult Health (Add Health). Data was accessed from <http://www.cpc.unc.edu/projects/addhealth>; only public use data was used. The Wave III sample included a total of 4,882 participants. Both the total sample ( $N = 4,882$ ) and the female sample ( $n = 2,445$ ) were used for this study.

Demographic information, all of which had been de-identified including gender, age, race/ethnicity, and socioeconomic status, was gathered. Thirty-six sections of questions were included in Wave III of the Add Health study. Each section included self-report survey questions that used Likert rating systems. Of interest for this study were questions from three sections: daily activities, social psychology and mental health, and religion and spirituality.

Five questions were selected for a physical activity scale from among the 45 items in the daily activities section. Question selection was based on literature review and communication with a content expert. The questions reflected a range from light activity to vigorous activity and explored activities beyond organized sports. Five questions were selected for a self-esteem scale from among the 27 items in the social psychology and mental health section. Question selection was based on literature review and communication with a content expert. The questions selected reflect a focus on well-being rather than pathology. Two questions were selected for a spirituality scale from

among the 42 items in the religion and spirituality section. Question selection was based on literature review and communication with a content expert. The questions selected reflect a focus on spirituality as unique from religion. Data analysis findings are presented in this chapter.

### **Statistical Description of the Variables**

#### **Dependent variable – physical activity.**

The mean score on the physical activity scale for the entire sample was .54 (SD = .85). For this scale, higher scores indicated higher levels of physical activity per week. These findings indicated that the average number of weekly activities among the entire sample were relatively low, less than 1. This indicated that the data is highly left skewed. Similarly, among female participants, the average physical activity was also highly skewed with a mean of .32 (SD = .64).

#### **Intervening variable – self-esteem.**

The mean score on the self-esteem scale for the entire sample was 1.70 (SD = .16). For this scale, higher scores indicated higher levels of self-esteem. These findings indicated that levels of self-esteem among the entire sample were relatively high. Among female participants, the mean was 1.71 (SD = .16).

#### **Independent variable – spirituality.**

The mean score on the spirituality scale for the entire sample was 1.55 (SD = .81). For this scale, higher scores indicated higher levels of spirituality. These findings indicated that levels of spirituality among the entire sample were moderate. Among female participants, the mean was 1.64 (SD = .77).

#### **Control variables – race, gender, age, socio-economic status.**

Among the entire sample, the majority of the respondents were White (70%), about one quarter were Black (25%), and 11% of the sample was Hispanic (see Table 2). Among female participants, 10.4% were Hispanic, 68.9% white, and 26.1% Black (see Table 2). The majority of the sample (61%) was female (see Table 2). The average age of participants in the entire sample was 22 years old. Female participant's average age was 22.10 years. The mean income was 2.14 or in the 10,000-15,000 dollars category. Female participants reported a mean income of 2.05.

Table 2

*Descriptive Statistics of the Study (entire sample, N=4,882 and Females n= 2, 445)*

Variable	Full Sample	Females
Black	25%	26%
Hispanic	11%	10%
White	70%	69%
Female	61%	n/a

### **Hypothesis testing**

Hypotheses 1 through 3 were examined using both correlational analyses (see Table 3) and Tobit regression (see Tables 4 – 6). Two tailed tests of significance set at the .05 level were used to test hypothesized bivariate relationships (Tabachnick & Fidell, 2007). Tobit regression was used to test multivariate relationships. Tobit regression was used as a check since the dependent variable, physical activity, was highly skewed and violates assumptions of normality in regression (DeMaris, 2004). While Tobit regression is similar to OLS or multiple regression with regards to how the beta coefficients are interpreted, it should be noted that unlike OLS or multiple regression, Tobit regression

does not have an equivalent  $R^2$  rather reports pseudo  $R^2$ . They are not calculated to determine goodness of fit or to minimize variance and are not useful independently or across data sets (Introduction, 2016). Sribney (2016) further explains that pseudo  $R^2$  in STATA using a Tobit model has little real meaning; the chi-squared and its  $p$ -value are the more important values to report. Hypothesis 4 was tested using a series of Tobit regression analyses as specified by the test of joint significance (see Table 7).

### **Hypothesis 1**

Hypothesis 1: Spirituality will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents. The positive direction of this hypothesis is derived from the theoretical proposition that inherited and acquired characteristics influence enactment of health-promoting behavior (Pender et al., 2006). Correlational analysis of the entire sample revealed a positive correlation between spirituality and engaging in physical activity ( $r = .05, p < .01$ ) (see Table 3). Tobit regression of spirituality on physical activity among female participants revealed a positive and statistically significant relationship when controlling for all other factors ( $B = .17, p = .042$ ), indicating that an increase in one unit of spirituality there is a .17 increase in physical activity (see Table 4). That is to say, among late adolescent and young adult females the more spiritual they are, the more physical activity they will participate in. Hypothesis one was supported by Tobit regression.

Table 3

*Pearson Correlation Results, Spirituality, Self-Esteem and Physical Activity (entire sample, N=4,882)*

Measure	Spirituality	Self-Esteem	Physical Activity
1. Spirituality	1.0	-0.17**	0.05**
2. Self-Esteem	-0.17**	1.0	-0.24**
3. Physical Activity	0.05	-0.24**	1.0

Note: \*= $p < .05$ , \*\*= $p < .01$ , \*\*\*= $p < .001$ , two-tailed tests

Table 4 Tobit Regression of Spirituality on Physical Activity among Females

Predictors	B	SE(B)	p	t	95% CI	
Intercept	2.38	0.42	.422	5.63	1.552	3.210
Spirituality	0.17	0.04	.042*	4.05	0.088	0.253
Age	-0.18	0.02	.022*	-8.20	-0.225	-0.139
Black	-0.48	0.08	.078	-6.13	-0.633	-0.326
Hispanic	-0.08	0.10	.103	-0.80	-0.285	0.120
Income	0.49	0.06	.059	8.30	1.552	3.210
N	2445					
Chi-square	128.34					
R <sup>2</sup>	0.03					

## Hypothesis 2

Hypothesis 2: Spirituality will have a positive relationship to self-esteem among late adolescent and young adult female respondents. The positive direction of this hypothesis is derived from the theoretical proposition that inherited and acquired characteristics influence affect (Pender et al., 2006). Correlational analysis of the entire sample revealed an inverse correlation between spirituality and self-esteem ( $r = -.17, p < .01$ ) (see Table 3). Tobit regression of spirituality on self-esteem among female participants revealed an inverse and statistically significant relationship when controlling for all other factors ( $B = -.04, p = .004$ ), indicating that as spirituality increases, self-esteem decreases (see Table 5). This is to say, among late adolescent and young adult

females the more spiritual they are the lower their self-esteem is. Additionally, age ( $p = .002$ ), race (Black  $p = .007$ , Hispanic  $p = .010$ ), and income ( $p = .005$ ) were also found to have a negative and statistically significant relationship with self-esteem. This is to say, late adolescent and young adult females of younger ages, who are not black or Hispanic, and have lower incomes have higher self-esteem. Hypothesis two was supported by Tobit regression, but was opposite of what was expected.

*Table 5 Tobit Regression of Spirituality on Self-Esteem among Females*

Predictors	<i>B</i>	SE( <i>B</i> )	<i>p</i>	<i>t</i>	95% CI	
Intercept	2.02	0.04	.042*	48.51	1.936	2.099
Spirituality	-0.04	0.00	.004*	-8.51	-0.043	-0.269
Age	-0.01	0.00	.002*	-3.96	-0.013	-0.004
Black	-0.00	0.01	.007*	-0.02	-0.014	0.014
Hispanic	-0.00	0.01	.010*	-0.11	-0.021	0.019
Income	-0.03	0.04	.005*	-5.26	-0.043	-0.020
<i>N</i>	2445					
<i>Chi-squared</i>	180.61					
<i>R</i> <sup>2</sup>	-0.09					

### Hypothesis 3

Hypothesis 3: Self-esteem will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents. This hypothesis is derived from two theoretical propositions. The first proposition states that perceived competence garnered from self-esteem to execute a given behavior increases the likelihood of actual performance of the behavior (Pender et al., 2006). Finally, when positive emotions or affect are associated with a behavior, the probability of commitment and action is increased. Correlational analysis of the entire sample revealed an inverse relationship between self-esteem and engaging in physical activity ( $r = -.24, p < .01$ ) (see Table 3). Tobit regression of self-esteem on physical activity among female participants

revealed an inverse relationship when controlling for all other factors ( $B = -1.16$ ,  $p = .19$ ), indicating that an increase in self-esteem results in a decrease in a physical activity (see Table 6). This is to say, among late adolescent and young adult females, lower self-esteem is associated with more physical activity. However, this relationship was not statistically significant; hypothesis three was not statistically supported by Tobit regression.

Table 6 *Tobit Regression of Self-Esteem on Physical Activity among Females*

Predictors	<i>B</i>	<i>SE(B)</i>	<i>p</i>	<i>t</i>	95% CI	
Intercept	4.89	0.39	.576	8.49	3.761	6.021
Self-Esteem	-1.16	0.20	.197	-5.91	-1.549	-0.777
Age	-0.19	0.02	.022*	-8.56	-0.233	-0.146
Black	-0.43	0.08	.076	-5.67	-0.580	0.282
Hispanic	-0.08	0.10	.102	-0.79	-0.282	0.120
Income	0.45	0.58	.059	7.61	0.334	0.566
<i>N</i>	2445					
<i>Chi-squared</i>	146.45					
<i>R</i> <sup>2</sup>	0.03					

#### Hypothesis 4

Hypothesis 4: Self-esteem will intervene in the relationship between spirituality and participation in physical activity among late adolescent and young adult female respondents. This hypothesis is derived from the totality of the aforementioned propositions. An intervening variable is presumed to influence the relationship between the independent and the dependent variables (MacKinnon et al., 2002). Test of intervening variable effects are important to explore the plausibility of causal sequences implied by theory (MacKinnon et al., 2002, p.16) and as presented in the HPM. Three Tobit regression models were used to test: 1) the direct relationship between spirituality



and physical activity, 2) the relationship between self-esteem and physical activity, and 3) the indirect relationship between spirituality and physical activity through self-esteem. A fourth model added the control variables.

Model one results reveal that spirituality is positively associated with physical activity ( $B = .098, p < .05$ ), indicating that an increase in spirituality results in an increase in physical activity. That is to say, the more spiritual one is the more physical activity they will engage in. Model two results reveal that self-esteem is negatively associated with physical activity but the results were not statistically significant. Model three results reveal that since the coefficient of spirituality is reduced (from .098 to .062) when self-esteem is added to the model; this suggests that self-esteem may mediate the relationship between spirituality and physical activity (see Table 7). Model four results reveal that that spirituality increases physical activity by .133 and self-esteem decreases physical activity by 1.06, indicating that the more spiritual and the less self-esteem is related to engaging in more physical activity. However, it should be noted that self-esteem is not statistically significant in model four. Hypothesis four was supported by multiple Tobit regression models and indicates that both the direct and indirect paths from spirituality to physical activity as posited in the HPM are jointly significant.

Table 7  
*Tobit Regression Coefficient Estimates (Standard Errors) for Models of Spirituality, Self-Esteem, and Physical Activity for Females*

<b>Predictors</b>	<b>Model 1 (spirituality and physical activities)</b>		<b>Model 2 (self-esteem and physical activities)</b>		<b>Model 3 (spirituality, physical activities, and self-esteem)</b>		<b>Model 4 (spirituality, physical activities, self- esteem, and covariance)</b>	
	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>	<i>B</i>	<i>p</i>
Intercept	-0.647	.081	1.361	.336	1.178	.359	4.541	.585
Spirituality	0.098	.042*			0.062	.042*	0.133	.042*
Self-Esteem			-1.108	.198	-1.032	.259	-1.061	.199
Age							-0.192	.022*
Black							-0.477	.078
Hispanic							-0.081	.103
Income							0.462	.059*
R <sup>2</sup>	0.0011		0.0062		0.0066		0.0327	

## **CHAPTER V.**

### **Discussion of the Findings**

The purpose of this study was to explore the relationships among spirituality, self-esteem, and participation in physical activity in late adolescent and young adult females. This chapter includes an interpretation of the findings. Discussion is based on the hypotheses derived from the theoretical propositions and posited relationships as presented in the HPM (Pender et al., 2015).

#### **Physical activity**

Among female participants, scores on the physical activity scale had a mean of .32 (SD = .64) indicating that the average physical activity was quite low and highly skewed. The rates of physical activity in this sample are consistent with other studies exploring physical activity among female adolescents. Rates of physical activity, especially among late adolescent and early adult females, are low. Fakhouri, Hughes, Burt, Song, Fulton et al. (2014) suggest that only one-quarter of U.S. youth meet physical activity guidelines. Brooks & Magnusson (2007) reinforce that for young women, adolescence often marks a decrease in physical activity, which persists well into adulthood. The low levels of physical activity reported in this study reflect an ongoing need to improve rates of participation in physical activity among late adolescent and young adult females.

#### **Self-esteem**

Among female participants, scores on the self-esteem scale had a mean of 1.71 (SD = .16) indicating that the average level of self-esteem was relatively high. The scale reflected global positive directed questions. Despite the fact that much of the literature

reflects the inclusion of items measuring indicators of lower self-esteem, the positively focused items included in this study are consistent with other research. Weber & Kurpius (2011) report that while females scored lower than males on measures of self-esteem, self-esteem itself was relatively high among females participants who reported an average self-esteem score of 33.32 ( $SD = 5.09$ ) on a scale of 10 to 40. Similarly, Haymen et al., (2007) report similar findings among the female population studied who reported an average self-esteem score of 31.48 ( $SD = 5.48$ ). Finally, Papazisis et al. (2014) found that while 71.3% of a sample nursing students, with an average age of 20.54 years old, reported average levels of self-esteem during their first year of school, by the fourth year self-esteem rose significantly by 25% reaching high levels of self-esteem. Self-esteem is a fundamental aspect of an adolescent's psychological function (Pinquart, 2012); research suggests that global self-esteem increases gradually through late adolescence into early adulthood (Birkeland et al., 2012)

### **Spirituality**

Among female participants, scores on the spirituality scale had a mean of 1.64 ( $SD = .77$ ) indicating that the average level of spirituality was relatively high. Sallquist et al. (2010) reported similar results among adolescents whose mean scores on a scale of 1 to 5 were relatively high at two points in time ( $M = 3.9$ ,  $SD = 0.38$  and  $M = 3.86$ ,  $SD = 0.41$ ). Additionally, Papazisis et al. (2014) reported that 60.9% of participants reported a spiritual belief and reported mean scores of 6.64 ( $SD = 2.18$ ), indicating strong beliefs. Higher levels of spirituality are often associated with African American race and vary inconsistently with gender and age (Rew & Wong, 2006; Spurr et al., 2012).

Interestingly, nearly all published literature reports spirituality scores among a convenience or purposeful sample which may influence findings.

### **Spirituality and physical activity**

The HPM (Pender et al., 2015) posits that inherited and acquired characteristics (personal factors) influence the enactment of health promoting behavior. Empirical evidence suggests that individuals who are spiritual are more likely to be active (Nagel & Sgoutas-Emch, 2007; Rachele et al., 2014; Rew & Wong, 2006). Based on the theoretical framework and the empirical evidence, a positive relationship between spirituality and physical activity was hypothesized.

Hypothesis one stated that spirituality would have a positive relationship to participation in physical activity among late adolescent and young adult females. While rates of participation in physical activity were generally low ( $M = .32$ ,  $SD = .64$ ), reported levels of spirituality were relatively high ( $M = 1.64$ ,  $SD = .77$ ). Hypothesis testing revealed a positive correlation between spirituality and engaging in physical activity ( $r = .05$ ,  $p < .01$ ). Further, a Tobit regression model of spirituality on physical activity revealed a positive and statistically significant relationship ( $B = .17$ ,  $p = .001$ ) when controlling for all other factors. The reported pseudo  $R^2$  was .03.

The positive relationship between spirituality and participation in physical activity was consistent with the extant literature. It should be noted that the literature exploring the two concepts from a positive perspective is limited when compared to research exploring spirituality and its relationship to risk behaviors. Rachele et al. (2014) report regression analysis results that indicate that the relationship between spirituality and self-reported physical activity is positive and statistically significant ( $\beta = .016$ ,  $p = .014$ ).

Nagel and Sgoutas-Emch (2007) further supported this relationship. Spiritual measures were found to be correlated with physical activity ( $r = .135, p < .05$ ). Additionally, participants who were in the high spirituality group were more likely than their less spiritual peers to participate in physical activity.

### **Spirituality and self-esteem**

The HPM (Pender et al., 2015) posits that inherited and acquired characteristics (personal factors) influence affect. Empirical evidence suggests that individuals who are spiritual have higher self-esteem (Haymen et al., 2007; Sallquist et al., 2010). Based on the theoretical framework and the empirical evidence, a positive relationship between spirituality and physical activity was hypothesized.

Hypothesis two stated that spirituality would have a positive relationship to self-esteem among late adolescent and young adult females. Reported levels of spirituality were relatively high ( $M = 1.64, SD = .77$ ); reported levels of self-esteem were also relatively high ( $M = 1.71, SD = .16$ ). Hypothesis testing revealed a weak and negative correlation between spirituality and self-esteem ( $r = -.17, p < .01$ ). Further, a Tobit regression model of spirituality on self-esteem revealed an inverse and statistically significant relationship ( $B = -.04, p < .001$ ) when controlling for all other factors. The reported pseudo  $R^2$  was  $-.09$ .

While the relationship between spirituality and self-esteem is consistent with extant research, the direction of the relationship revealed in this study was inconsistent with the findings reported by Sallquist et al. (2010) who reported in a longitudinal study that self-esteem was statistically significantly ( $r = .22, p < .05$ ) related to spirituality at the third and final point in time. Further, Haymen et al. (2007) found that spirituality was

positively and statistically significantly correlated to self-esteem ( $r = .19, p = .005$ ). Furthermore, the researchers reported that the correlation between spirituality and self-esteem was statistically significant ( $r = .22, p = .01$ ) for female participants but was not statistically significant for male participants. Interestingly, the researchers also reported that spirituality was negatively related to body surveillance among the male participants ( $r = -.41, p < .002$ ). This indicates that the more spiritual the male participant, the less likely he was to be concerned with monitoring his body image. Given the aforementioned suggestion and that body image and self-esteem are often cited as positively correlated among females (Birkeland et al., 2012), it seems reasonable to suggest that for the female participants in this study, higher levels of spirituality result in less concern about self-esteem or less need for high levels of self-esteem. Females can be highly spiritual while also reporting lower self-esteem (Weber & Kurpius, 2011). This unexpected finding underscores the complex relationship between spiritual and psychological constructs and warrants further investigation (Sallquist et al., 2010).

### **Self-esteem and physical activity**

The HPM (Pender et al., 2015) posits that perceived competence garnered from self-esteem to participate in given behavior increases the likelihood of participation in that behavior. Further, theorists suggest that when positive emotion or affect are associated with a behavior, the probability of commitment to that action is increased (Pender et al., 2006). Empirical evidence suggests that self-esteem is a correlate of physical activity (Biddle et al., 2005). Based on the theoretical framework and the empirical evidence, a positive relationship between spirituality and physical activity was hypothesized.

Hypothesis three stated that self-esteem would have a positive relationship to participation in physical activity among late adolescent and young adult females. Reported levels of self-esteem were relatively high ( $M = 1.71$ ,  $SD = .16$ ) and levels of participation in physical activity were relatively low ( $M = .32$ ,  $SD = .64$ ). Hypothesis testing revealed a negative correlation between self-esteem and participation in physical activity ( $r = -.24$ ,  $p < .01$ ). Further, a Tobit regression model of self-esteem on physical activity revealed an inverse relationship ( $B = -1.16$ ,  $p = .19$ ) when controlling for all other factors; this finding was not statistically significant. The reported pseudo  $R^2$  was .03.

While the relationship between self-esteem and physical activity is consistent with extant research, the direction of the relationship revealed in this study was inconsistent with the findings reported by Kristjansson et al. (2010) who reported that self-esteem was statistically significantly ( $r = .22$ ,  $p < .01$ ) related to physical activity. Further, in a longitudinal study, Birkeland et al. (2012) reported statistically significant relationships between global self-esteem and physical activity at all six measurement points in time. Global self-esteem at ages 14 ( $r = .010$ ,  $p < .01$ ), 15 ( $r = .14$ ,  $p < .01$ ), 18 ( $r = .10$ ,  $p < .05$ ), 21 ( $r = .13$ ,  $p < .01$ ), and 23 ( $r = .12$ ,  $p < .01$ ) years of age were all found to be correlated with physical activity.

It seems important to note that most research has considered the effect of physical activity on self-esteem, rather than the influence of self-esteem on physical activity as posited by the HPM (Pender et al., 2015). It has been suggested that perception of body image is one of the strongest sources of self-esteem in adolescence (Birkeland et al., 2012); however, while physical activity is associated with more positive body image and self-worth, most studies report there are too few studies using measures of global self-



esteem to draw meaningful conclusions (Biddle et al., 2005). Kahn et al. (2008) reported in a large sample ( $N = 12,812$ ) that global self-esteem was not found to be correlated with physical activity. It may be that for participants in this study, high levels of self-esteem have resulted in reduced perceived need to participate in physical activity.

### **Self-esteem as intervening on relationship between spirituality and physical activity**

Theorists suggest that activity-related affect may influence the relationship between personal factors and commitment to a health promoting action (Pender et al., 2006). Limited empirical evidence intimates that self-esteem may intervene on the relationship between spirituality and physical activity (Joshani & Daemi, 2015; Spurr et al., 2012). The empirical literature reveals relationships between spirituality and self-esteem as well as between self-esteem and physical activity. Congruent with the HPM, these relationships suggest that self-esteem may mediate the relationship between spirituality and physical activity. Based on the theoretical framework and the empirical evidence, self-esteem was hypothesized to intervene on the relationship spirituality and physical activity.

Hypothesis four stated that self-esteem would intervene on the relationship between spirituality and participation in physical activity among late adolescent and young adult females. Reported levels of self-esteem ( $M = 1.71$ ,  $SD = .16$ ) and spirituality ( $M = 1.64$ ,  $SD = .77$ ) were relatively high while levels of engagement in physical activity were relatively low ( $M = .32$ ,  $SD = .64$ ). Correlations were revealed between each of the possible combinations of variables: spirituality and physical activity ( $r = .05$ ,  $p < .01$ ), spirituality and self-esteem ( $r = -.17$ ,  $p < .01$ ), and self-esteem and physical activity ( $r = -.24$ ,  $p < .01$ ). Multiple Tobit regression models revealed the complex relationships

among the variables of interest. Three Tobit regression models were used to test: 1) the direct relationship between spirituality and physical activity, 2) the relationship between self-esteem and physical activity, and 3) the indirect relationship between spirituality and physical activity through self-esteem. A fourth model added the control variables. The relationship between spirituality and physical activity was statistically significant across all models ( $p = .042$ ). The final model included all covariance; age ( $\beta = -.192, p = .022$ ) and income ( $\beta = .462, p = .059$ ) were significant indicating that as age decreases physical activity increases and as income increases physical activity increases. It is important to note that race (Black or Hispanic) was not significant. Finally, and as hypothesized, the coefficient of spirituality is reduced when self-esteem is added to the model indicating that self-esteem intervenes on the relationship between spirituality and physical activity. The reported pseudo  $R^2$  for models 1 – 4 were .0011, .0062, .0066 and .0327 respectively.

Few studies have explored the influence of mental health constructs on the relationship between spirituality and health outcomes; when such constructs are included, most commonly depression or coping are measured (Cotton et al., 2006). Broadly, this study supports the inclusion of a mental health measure when exploring the relationship between spirituality and physical activity. Further, the findings of this study suggest that a positive measure of mental health such as self-esteem, may help to develop a more clear understanding of the nature of motivation for behavior.

## **CHAPTER VI.**

### **Summary, Conclusions, Implications, and Recommendations**

The purpose of this study was to explore the relationships among spirituality, self-esteem, and participation in physical activity in late adolescent and young adult females. This chapter includes a summary of the study and its findings. Conclusions are drawn and implications and recommendations for practice and future research are presented.

#### **Summary**

The purpose of this study was to explore the relationships among spirituality, self-esteem, and participation in physical activity in a sample of late adolescent and early adult females. Two paths, as posited by the Health Promotion Model (Pender et al., 2015), were considered. A direct path from spirituality to physical activity and an indirect path from spirituality to physical activity through self-esteem, were examined.

Physical activity is a multifaceted health outcome. It defined as the movement of skeletal muscle (Caspersen et al., 1985). Physical activity may range from light activity to vigorous activity which may be monitored, “planned, structured, repetitive, and purposive...” (Caspersen et al., 1985, p.128) or may be an incidental part of daily life or leisure (Walker & Hill-Polerecky, 1996). Self-esteem is a psychological indicator of an affective state. It is defined as a feeling about one’s own self-worth which reflects evaluation of one’s own worth (Crocker & Major, 1989; Liu et al., 2015). Spirituality is a complex personal concept. It is defined as the lived intrinsic and dynamic experience or journey of seeking ultimate meaning and purpose through the connection or relationship to the self, others, and nature (Burkhardt & Nagai-Jacobson, 1994; Puchalski et al., 2014).

The Health Promotion Model (Pender et al., 2015) stipulates that personal factors, such as spirituality, may motivate a person's decisions about health behaviors such as physical activity. According to Pender et al. (2015), the relationship between individual characteristics and health outcomes is a direct one. This relationship is supported by empirical literature (Nagel & Sgoutas-Emch, 2007; Rachele et al., 2014; Raj et al., 2013; Ramanathan & Crocker, 2009; Rew & Wong, 2006) which suggests that spirituality has a positive relationship to physical activity and that the relationship may be circular in nature.

Theorists also posit that the relationship between personal factors and a health promoting outcome may consider the influence of behavior specific affect (Pender et al., 2015). The empirical literature supports that activity-related affect, such as self-esteem, is correlated with both spirituality and physical activity independently. Spirituality is related to self-esteem. This relationship is supported by the empirical literature (Haymen et al., 2007; Joshanloo & Daemi, 2015; Papazisis et al., 2014; Sallquist et al., 2010; To et al., 2014; Weber & Kurpius, 2011; Wong et al., 2006; Yonker et al., 2012) which suggests that the relationship is a positive one and may be circular in nature. Self-esteem is related to physical activity. This relationship is supported by the empirical literature (Birkeland et al., 2012; Faulkner et al., 2007; Kahn et al., 2008; Kristjansson et al., 2010; Nelson & Gordon-Larsen, 2006; Schmaltz et al., 2007; Wood et al., 2013) which suggests that the relationship may not be statistically significant may not be unidirectional (self-esteem to physical activity) in nature.

The HPM (Pender et al., 2015) stipulates activity-related affect, such as self-esteem, may intervene on the relationship between spirituality and physical activity,

suggesting that the relationship between spirituality and physical activity may also be an indirect or mediated one. The empirical literature offers support for this relationship; however, literature exploring self-esteem as intervening on the relationship between spirituality and physical activity is limited (Joshani & Daemi, 2015; H. Koenig, personal communication, Summer 2013; Spurr et al., 2012).

Based on the theorized relationships among personal factors, activity related affect and health promotion behavior, the following hypotheses were derived:

1. Spirituality will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents.
2. Spirituality will have a positive relationship to self-esteem among late adolescent and young adult female respondents.
3. Self-esteem will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents.
4. Self-esteem will intervene on the relationship between spirituality and participation in physical activity among late adolescent and young adult female respondents.

The subjects were participants in Wave III of the Add Health study. Publically available data included 4,882 ( $N = 4,882$ ). Of particular interest to this study were the 2,445 female participants ( $n = 2,445$ ). The majority of the respondents were female (61%) with an average age of 22 years old. Among the entire sample, the majority were White (70%), about one quarter were Black (25%), and 11% of the sample was Hispanic. Among female participants, 10.4% were Hispanic, 68.9% white, and 26.1% Black.

Data were collected using scales created from three sections of the publically available data. Five questions were selected for a physical activity scale from among the 45 items in the daily activities section. The questions reflected a range of levels of activity from light activity to vigorous activity and explored activities beyond organized sports. Five questions were selected for a self-esteem scale from among the 27 items in the social psychology and mental health section. The questions selected reflect a focus on well-being rather than pathology. Two questions were selected for a spirituality scale from among the 42 items in the religion and spirituality section. The questions selected reflect a focus on spirituality as unique from religion.

Data were analyzed using both SPSS version 22 and STATA. SPSS was used for alpha coefficients, descriptive statistics and correlations. For this sample, the alpha coefficient for the 5-item physical activity scale was .684 and approximated reported alpha for the physical activity subscale of the health promoting lifestyle profile (HPLP) (Walker et al., 1987) and exceeds the reported alpha (0.64) for the adolescent HPLP (Hendricks et al., 2006). The alpha coefficient for the 5-item self-esteem scale was .705 and approximated reported reliabilities for the Rosenberg (1965) self-esteem scale. The alpha coefficient for the 2-item spirituality scale was .820. Descriptive statistics were used to analyze sample characteristics. Pearson's correlation was used to examine the relationships between the study variables.

STATA was used for hypothesis testing using Tobit regression. The level of significance used for hypothesis testing was .05 (Wang & Xue, 2016). The first hypothesis, which stated that spirituality will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents, was

supported. The second hypothesis, which stated that spirituality will have a positive relationship to self-esteem among late adolescent and young adult female respondents, was supported, but in the inverse. The third hypothesis, which stated that self-esteem will have a positive relationship to participation in physical activity among late adolescent and young adult female respondents, was indicated by correlation, but not supported by regression analysis. The fourth hypothesis, which stated that self-esteem will intervene on the relationship between spirituality and engaging in physical activity among late adolescent and young adult female respondents, was supported.

In summary, theoretical relationships as presented in the Health Promotion Model (Pender et al., 2015) and as supported by empirical literature were explored. A large, publically available data set was selected given its methodological strengths, such as population representativeness and data collection methods, its explicit focus on positive health outcomes rather than disease processes, and its careful selection of items specific to spirituality as distinct from religion. Both the direct relationship of spirituality on physical activity and the indirect relationship of spirituality on physical activity through self-esteem were supported.

### **Limitations**

The major limitation of this study was its descriptive correlational cross-sectional design which cannot determine causality and explores one time period (Burns & Grove, 2011). Findings cannot be considered evidence to support the causes of participation in physical activity among late adolescent and young adult females. The study design was, however, determined to be the most appropriate for several reasons: the stated purpose of the study, the limited research conducted from a nursing perspective, and the limited

research exploring the combination of variables of interest. Protection against bias was supported through selection of a theoretical framework, careful conceptual and operational definition of the variables of interest, the selection of a representative sample of adequate size, psychometric reporting of instruments, and robust statistical methods.

Another limitation was the use of self-reported data. It is plausible that participants responded to questions reflecting social desirability. Given the intrinsic nature of spirituality as it was defined and measured in this research, it is reasonable to consider that self-report remains the most accurate method of measuring the covert concept (Yonker et al., 2012) as opposed to other conceptualizations of the concept which might be more observable (i.e. religious attendance). It has been suggested that intrinsic spirituality is the most accurate measurement of late adolescent and young adult spirituality as opposed to distal measures of the concept which are reflective of parental perspective (Cotton et al., 2006).

## **Conclusions**

The findings of this study support the relationships among spirituality, self-esteem, and participation in physical activity in late adolescent and young adult females. Spirituality was found to have both a direct and indirect relationship to the participation in physical activity. Both the direct path from spirituality to participation in physical activity and the indirect path from spirituality through self-esteem to physical activity were found to be jointly significant.

Spirituality was found to have a positive relationship to participation in physical activity. This suggests that spirituality, as measured in this study, may be an important intrinsic motivation for young women to participate in physical activity. Interestingly,



some of the variables included in the study were inversely related. Spirituality was found to be inversely related to self-esteem, indicating that as spirituality increases, self-esteem decreases. The strength of this finding was weak, but is perplexing as it seems contrary to most empirical literature which suggests that as spirituality increases so will self-esteem. This may indicate that as intrinsic spiritual resources are increased, the need for cognitive/affective resources decrease. Further, self-esteem was found to be inversely related to physical activity, indicating that as self-esteem increases, physical activity decreases. While the relationship was not statistically significant, the direction of the relationship seems to indicate that the better a late adolescent or young adult woman feels about herself, the less likely she is to participate in physical activity. These findings offer an interesting perspective on the commonly held belief that women link their physical self with their subjective feelings of self. That is, the participants in this study with higher levels of self-esteem may not have participated in as much physical activity because of holding a generally positive subjective image of themselves. This finding seems to be true of global positive self-esteem (Birkeland et al., 2012). Finally, when self-esteem was added as an intervening variable on the relationship between self-esteem and physical activity, the spirituality coefficient was reduced indicating that self-esteem can intervene on the relationship between spirituality and physical activity.

### **Implications for Practice**

Nurses have a rich tradition of understanding patients from a holistic perspective. The findings from this research broadly support that the relationship between body, mind, and spirit is a multifaceted one. The balance among physical, psychological, and spiritual domains contribute to wellness, yet nursing practice remains focused on disease

treatment. The findings from this study support a multi-dimensional approach to education and care.

Findings from this study suggest that participation in physical activity among late adolescent and early adult females is related to spirituality and self-esteem. While theory suggests that the relationships among spirituality, self-esteem, and physical activity are linear, empirical literature and the findings from this study suggest that perhaps the relationships are more complex. Given that physical activity tends to decrease in late adolescence and early adulthood and given that rates of participation in physical activity among people in this age group are already well below national standards, nurses are in an important position to both receive education and offer education targeted at increasing rates of physical activity. Finally, opportunities for participation in physical activity must be made affordable to all as higher income seems to be related to higher levels of physical activity. Spirituality has a positive and direct relationship with physical activity indicating that interventions aimed at improving opportunities for spiritual nourishment may improve physical activity. It might also be considered that interventions aimed at improving opportunities for physical activity may increase spirituality. Self-esteem should also be carefully considered in the planning of education and other intervention. For late adolescent and young adult females with higher levels of self-esteem, encouragement to participate in physical activity may need to extend beyond discussion of the physical benefits of participation.

### **Recommendations**

Based on the findings and limitations of this study, it would be appropriate to replicate this study using the recently available Wave IV data. Using this data would

offer information about the relationships at a second point in time. It may be useful to employ higher level statistical analyses to determine directionality of the posited relationships. Further, it is recommended that studies include age, race, gender, and income as covariates as each of these variables may play a role in more fully explaining the relationships among spirituality, self-esteem, and engaging in physical activity. For example, in this study, younger age was related to increased participation in physical activity. This finding is not a surprise and is consistent with extant research and should inform research, education and policy to support increased opportunities for physical activity among late adolescent and young adults. Race was only statistically significant in the relationship between spirituality and self-esteem. Recent definitions of spirituality suggest that it is related to sociocultural factors and that it is expressed through beliefs, values, traditions, and practices (Puchalski et al., 2014). Extant research suggests that race may influence participation in physical activity (Raj et al., 2013; Ramanathan & Crocker, 2009); however, sampling procedures may have influenced previous findings. Given that race certainly plays a role in the development of self it seems reasonable to include in future studies exploring proximal resources or motivation for health behavior. The female participants in this study were found to be statistically representative of the entire sample; however, in other studies gender has been inconsistently related to the relationships of interest in this study. While female gender tends to be related to higher spirituality, lower self-esteem, and lower rates of physical activity, these findings are not consistent. Gender remains an important consideration for future studies. Finally, in this study, income was found to be statistically significant when included as a covariate in the relationship among spirituality, self-esteem, and physical activity. Lower income levels

were related to lower levels of physical activity. Given the vulnerable nature of the general health and well-being of individuals of lower income, it seems appropriate to carefully consider making opportunities for participation in physical activity affordable.

In summary, based on the findings of this study which reveal complex relationships between and among spirituality, self-esteem, and physical activity and indicate that the relationships may circular in nature, it would be prudent to consider developing nurse guided multifaceted interventions which consider each of the variables as an opportunity for intervention. Person centered care requires that nurses develop individualized interventions that meet unique patient needs. For some late adolescents and young adult females, intervention may best be aimed at supporting proximal or personal resources such as spirituality, for others intervention may be best at the point of physical activity, and for other still, interventions aimed at supporting behavior specific affect.

Specific areas for future research might include exploring research questions such as:

1. What is the effect of a spiritually based intervention on self-esteem among late adolescent and young adult females?
2. What is the effect of a spiritually based intervention on physical activity among late adolescent and young adult females?
3. What is the effect of a self-esteem based intervention on physical activity among late adolescent and young adult females?
4. What is the effect of a physical activity based intervention on self-esteem among late adolescent and young adult females?

5. What is the effect of a physical activity based intervention on spirituality among late adolescent and young adult females?

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