2017

Effect of Physical Activity Frequency on Body Image Among Young Adult Women

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Walden University
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Abstract

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MA, California State University, Long Beach, 2011

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Philosophy

Psychology

Walden University

June 2017

Abstract

Approximately half of all female adolescents and young adults suffer from body dissatisfaction and, in turn, body image-related health concerns. Poor body image can contribute to various negative health behaviors including low self-esteem, depression, anxiety, eating disorders, and suicide. Research indicates a positive relationship between physical activity and self-esteem, and between self-esteem and body image. However, a paucity of research examines the effect of physical activity frequency on the body image of young women with two-like body compositions, as measured by body mass index (BMI). Based on self-discrepancy theory, self-schema theory, and the health belief model, this quantitative study explored the difference in body image in 18- to 20-year-old females within similar BMI categories who differ in physical activity frequency. A survey design was employed to measure BMI and physical activity frequency, the independent variables. Body image was the dependent variable. Participants were 161 females between the ages of 18 and 20 years who were grouped into a BMI category of overweight, normal weight, or underweight based on self-reported height and weight. Participants completed a survey on physical activity frequency and body image from 2 previously developed instruments: rapid assessment of physical activity and body image states scale. An analysis of variance indicated that physical activity frequency significantly affects body image among women in the overweight category, and indicated a positive relationship between physical activity frequency and body image. Findings could promote physical education programs and other organized physical activity programs in communities, and in turn, improve body image within young adult females.

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Chapter 1: Introduction to the Study

Introduction

Research has consistently supported the notion that physical activity provides an abundance of health benefits (Colman & Dave, 2013). In addition to combatting many diseases, those who are physically active report feeling better, both physically and psychologically (Colman & Dave, 2013). Although the mind and body reap the benefits of physical activity, they do not always do so proportionately (Kay & Shipman, 2014). In other words, one's physique might improve with regard to body composition, but one's cognitive perceptions of this growth might not be congruent with such improvements (Kay & Shipman, 2014). According to Higgins' (1999) self-discrepancy theory, discrepancies are often present among how people see their bodies, what they want their bodies to be, and what they believe others expect it to be. The way a person *perceives* his or her own physical health and appearance can be as imperative to overall health as body composition itself (Higgins, 1999).

It is important to investigate ways to enhance body image because body dissatisfaction is increasingly prevalent (Smolak, 2004). Although an imbalanced body composition can contribute to an increased risk for developing many diseases, such as cancer, hypertension, and diabetes, body dissatisfaction can contribute to a spectrum of health concerns as well (Kay & Shipman, 2014). Body dissatisfaction is present in approximately half of females as they enter adolescence (Kay & Shipman, 2014). Body dissatisfaction is associated with low self-esteem, depression, eating disorders, and many other negative health related behaviors and conditions (Kay & Shipman, 2014). Physical

activity has been demonstrated to improve body image, but the extent to which it affects individuals with similar body mass indexes (BMIs) has not been thoroughly researched (Buckworth, 2013). Higgins (1999) identified the *actual self* as the numbers that body composition would reflect, which refers to the ratio of lean tissue to fat tissue. The *ideal self* refers to an optimal vision a person has of his or her own body image. This study could help identify potential discrepancies in the actual self and ideal self. In addition, it could highlight potential disconnects between body composition and perceptions of such composition. This study could also emphasize the strength in what individuals *see*, in addition to what each individual's body composition suggests one actually *is*. The results could be used to prioritize care and prevention for poor body image through physical activity programs, in addition to the evidence that already supports care and prevention for poor body composition.

In the remainder of this chapter, I will briefly summarize the literature related to body image and physical activity. I will expose the gaps in the literature, and I will explain the intentions of this study. I will identify the variables and I will address the research question and hypotheses. I will then discuss the theoretical framework I used, as well as the rationale, assumptions, and limitations of the study. Finally, I will outline the contributions and significance of my work.

Background of the Problem

Body image is loosely defined as how one sees oneself (Grogan, 2007). Many factors contribute to this perception. Cash (2002) analyzed a cognitive-behavioral model emphasizing body image development that encompasses the integration of cultural

socialization, physical and interpersonal characteristics, and personality attributes with regard to body image assessment. This model suggests a mutual relationship is present between affective, cognitive, and physical processes (Cash, 2002). Overall, this perception can be completely unrelated to the actual body. When that is the case, distortion may be present (Grogan, 2007).

In some cases, positive distortion may be present (Kay & Shipman, 2014). If one suffers from an unideal body composition that increases his or her risk for disease, yet he or she sees oneself as beautiful, his or her body image would outweigh the health of the physical body itself (Kay & Shipman, 2014). In most cases, however, negative distortion is present (Sands & Wardle, 2003). In this scenario, one sees oneself in a less ideal light than his or her physical self may depict. This means that the perception of self can feel negative, imbalanced, and unworthy either by one's own standards, or what he or she believes others expect (Sands & Wardle, 2003). Higgin's (1999) self-discrepancy theory suggests that people define body image by their actual image, ideal image, and ought image. If a discrepancy or contradiction exists among these ideals, negative distortions and body dissatisfaction are usually present (Higgins, 1999).

When one experiences a discrepancy between any of the actual, ideal, or ought images, this often translates into a more negative body image, which often stems from insecurities and low self-esteem (Carlock, 2013). Those who suffer from low self-esteem have an increased likelihood of suffering from depression, substance abuse, eating disorders, suicide, and other negative behaviors (Carlock, 2013). One population that is highly susceptible to low self-esteem are female adolescents and young adults. Carlock (2013)

suggested that approximately 51% of young women between the ages of 15 and 18 years report they are unhappy with their appearance. Approximately 15% of them have experienced at least one episode of depression, and the same percentage expressed they were unhappy most of the time (Carlock, 2013). In another study by Kay and Shipman (2014), when females were asked what makes them feel most self-worthy, the majority of females chose being attractive. This suggests that many women only feel worthy if they feel attractive, and based on the study by Carlock (2013), only approximately half of the female adolescent population felt satisfied with how they looked. This research combined suggests that what one perceives is not always in alignment with what others see, or with what physical evidence supports (Carlock, 2013; Kay & Shipman, 2014).

Statement of the Problem

One's self-esteem is often comparable to one's body image (Mäkinen, Puukko-Viertomies, Lindberg, Siimes, & Aalberg, 2012). Those with higher self-esteem generally have a more positive body image when compared to those with low self-esteem (Mäkinen et al., 2012). Physical activity has consistently been associated with positive effects on several psychological variables such as anger, anxiety, depression, self-efficacy, and self-esteem (Calfas & Taylor, 2004). If physical activity improves self-esteem, and an increased self-esteem improves body image, then physical activity can significantly affect body image (Annesi & Porter, 2015). Campbell and Hausenblas (2009) supported this notion stating that exercise intervention groups showed an improvement in body image over control conditions, which involved a sedentary routine of little to no physical activity.

A gap in the literature exists, however, regarding the effect of physical activity frequency on the body image of young adult women who share comparable body compositions based on BMI scores. In other words, if two young adult females who have an identical BMI score are asked to report about their body image, but one is more physically active than the other, their individual perceptions of body image may not be consistent. Young adult females are not necessarily seeing themselves for who they are. In addition to other potential variables, perceptions of body image may be distorted due to psychological insecurities. Many factors may contribute to distorted perceptions in young adulthood, including the media, hormonal imbalances, and dietary habits (Cash, 2004). Although physical activity can mitigate these factors, the extent to which it can reduce their negative effects on body image among young adult women with similar body compositions is not fully understood.

Purpose of the Study

The purpose of this quantitative study was to explore the difference in body image in 18- to 20-year-old females within similar BMI categories who differ in physical activity frequency. The independent variables were BMI and physical activity frequency. I calculated BMI from self-reported height and weight and I categorized the calculations based on intervals provided by the Centers for Disease Control (CDC, 2015). I measured physical activity frequency with the Rapid Assessment of Physical Activity (RAPA) instrument. The dependent variable was body image. I measured body image with the Body Image States Scale (BISS).

Research Question and Hypotheses

What is the difference in young adult women's body image within similar BMI categories who differ in physical activity frequency?

$H_0$1: There is no significant difference in young adult women's body image, as measured by the BISS, within similar BMI categories between those who are more physically active and those who are less physically active, as measured by the RAPA.

$H_1$1: There is a significant difference in young adult women's body image, as measured by the BISS, within similar BMI categories between those who are more physically active and those who are less physically active, as measured by the RAPA.

Theoretical Framework

Several theories contributed to the framework of this research. The main theory that I used to understand body image and physical activity among 18- to 20-year-old females was Higgins's (1999) self-discrepancy theory. Higgins discusses the domains of body image to include the actual, the ideal, and the ought. The *actual* refers to the body composition behind the image, the *ideal* refers to the body image one would prefer, and the *ought* refers to the body image one might feel others prefer of them. These domains contribute to the formation of body image, and any discrepancy present within these domains usually results in body dissatisfaction to some degree (Higgins, 1999). Similar to Higgins' theory, Markus's (1977) self-schema theory suggested that women use three reference points to define their perceptions of their appearance. These points of reference include the socially represented ideal body, objective ideal body, and internalized ideal body. The socially represented ideal body refers to how one's social environment shapes how they feel and expect to look. The

objective ideal body refers to how they actually feel about their body. The internalized ideal body refers to how they would like to look and feel. These ideals will vary depending factors that I discuss in more detail in the literature review. Finally, the heath belief model, which predicts an individual's engagement in variety of health related behaviors, supports the relationship between body image and physical activity (Rosenstock, Strecher, & Becker, 1988).

Nature of the Study

In this quantitative study, I used a survey design. I chose a survey design to best capture all variables through self-reporting procedures. BMI and physical activity frequency were the independent variables. Body image was the dependent variable. I grouped participants' BMI scores into three categories (Category 1: 17-20 [<10th % - 25th %], Category 2: 21-23 [50th %], Category 3: 24-29 [85th % ->90th %]). I determined these categories by the underweight, normal weight, and overweight categories established by the CDC (2015). Within each BMI category, participants were grouped into five categories based on the RAPA (1 = sedentary, 2 = underactive, 3 = underactive regular–light activities, 4 = underactive regular, 5 = active.) There were seven total categories within the RAPA; however, per their scoring guidelines, I considered Categories 6 and 7 to be within the active category, which is Category 5. I analyzed the data to determine the influence of physical activity frequency within each BMI category on body image, as measured by the BISS. I used descriptive statistics to summarize all data. I ran a one-way analysis of variance (ANOVA) to determine if there were any significant differences in body image within each of the BMI categories. To strengthen the power of the ANOVA *F* tests, I combined physical

activity Categories 1 to 3 to create a new physical activity factor with three total categories. I ran a post hoc analysis within the overweight category to determine which physical activity categories experienced a significant difference in body image. I set the alpha to .05.

Participants were a convenience sample of 161 who were 18 to 20 years of age. I used this population because young adult females report a high incidence of body dissatisfaction (Kay & Shipman, 2014). I recruited participants from a Southwestern U.S. community college. I obtained Institutional review board (IRB) approval from the southwestern U.S. community college, as well as Walden University. I recruited participants via email and/or course announcement, and the email contained a message that outlined the purpose of the study, as well as the survey link hosted by SurveyMonkey. The survey itself contained consent to participate. I provide a detailed description of the research design, measures, and rationale in Chapter 3.

Definition of Terms

The following are terms that I used in this study:

Body dissatisfaction is defined as a person's unfavorable evaluation of his or her body (Grogan, 2007).

Body composition refers to the ratio of fat, bone, water, and muscle within the body (Colman & Dave, 2013). This will be determined through a measurement of self-reported BMI.

Body image is regarded as how one sees oneself (Grogan, 2007).

Body mass index refers to one's weight in kilograms divided by height squared in centimeters (CDC, 2015).

Physical activity is defined as any bodily movement, produced by skeletal muscles, that requires energy expenditure (World Health Organization, 2016). For this study, I measured physical activity by frequency and intensity according to the RAPA (University of Washington Health Promotion Research Center, 2006).

Self-esteem is described as confidence in one's own worth and abilities (Carlock, 2013).

Assumptions and Limitations

I assumed that participants voluntarily and candidly completed the survey to the best of their ability. It was not possible to validate the honesty of participants' responses; therefore, I assumed that the self-reported material collected in this study may have posed a limitation. I also assumed that all instruments appropriately measured the variables of interest. It was assumed that the study did not subject participants to any harm. I addressed this through the voluntary nature of the study and the ability for participants to conclude and exit the survey at any time. I assumed that subjects were not influenced to participate due to my position as an instructor, and this was addressed by my temporary absence in my instructing role.

Scope and Delimitations

I focused on the influence of physical activity on body image in participants with like body compositions, based on BMI. Specifically, I focused on adult females 18 to 20 years of age. I examined whether or not body image was consistent among those with similar body compositions based on physical activity levels. The results compared like body

compositions and assessed their body image based on differing activity levels. This study was limited to 18- to 20-year-old adult females in community college who had internet access. This study was also limited to examining body image and physical activity levels. Finally, this research was limited to examining only some of the factors associated with body image and physical activity.

Significance of the Study

Knowing that many factors can contribute to improving body image, it is essential to understand which of these factors can be controlled, and how. Physical activity is one factor that can be controlled, so knowing how it can optimally contribute to body image can help females take ownership of their self-esteem as it relates to physical activity and body image. With physical activity associated with positive effects on body image, identifying how individuals with two-like body compositions perceive their body image based on physical activity frequency can isolate this factor and allow for a better understanding of its significance. Two females who have identical body compositions, yet who are *not* comparably physically active, might perceive their body image as the different. With research grounding the idea that physical activity improves self-esteem, and higher self-esteem translates into a more positive body image, differences in perception based on physical activity would exist (Calfas & Taylor, 2004). The extent of any difference in physical activity levels may contribute to a difference in body image. If exercise can not only improve body composition, but arguably equally important also improve body image, this avenue of research is worth exploring.

Self-esteem starts to decline in females during middle adolescence (Clay, Vignoles, & Dittmar, 2005). One possible cause for this comes from changes in body image. In young adult females, self-esteem declines are associated most significantly with body dissatisfaction (Clay et al., 2005). No matter where a woman lies on the age spectrum, a decline in self-esteem is tied to body image (Clay et al., 2005). Many researchers have named female concerns relating to appearance as *normative discontent* that will affect almost all women at some point in time (Stiegel- Moore & Franko, 2002; Tiggerman & Slater, 2004). Body dissatisfaction has been more closely linked to appearance-related perceptions, rather than physical reality (Stiegel-Moore& Franko, 2002; Tiggerman & Slater, 2004). This finding reiterates that distorted beliefs and cognitions can be more powerful than one's actual body mass (Butters & Cash, 1987). Therefore, identifying which factors relevant to body image can be controlled, and how, can provide females a better grasp on cognitions related to body image.

The effects of poor body composition have been researched for centuries (Baumgartner, 2000). In contrast, body image has become an increasingly important health concern only during the last 30 years (Fisher, 2014). This evolution has been linked to changes in cultural socialization (Cash, 2002). Regardless of the reasons behind this transformation, the prevalence of body image issues are on the rise, and the science behind this psychological dilemma is not as easily studied and understood as with body composition (Kay & Shipman, 2014). Several studies support that women's perceptions of their bodies can be completely incongruent with their body composition (Kay & Shipman, 3014; Butters

& Cash, 1987). With body satisfaction comes greater self-esteem, improved relationships, increased physical activity, and better overall health (Neumark-Sztainer et al., 2006).

Summary

Research has concluded that physical activity improves self-esteem, and therefore, improves body image (Grogan, 2007). However, the effect of physical activity on like body compositions in young adult women has yet to be studied. With body dissatisfaction being associated with perceived appearance, more so than with body composition, the factors that contribute to a more positive body image are worth exploring (Stiegel-Moore& Franko, 2002; Tiggerman & Slater, 2004). Many young adult females have some measure of discrepancy between their ideal self and their actual self, and this discrepancy often leads to negative feelings toward one's own body (Higgins, 1999). Negative feelings toward one's body can lead to other depressive behaviors such as eating disorders, anxiety, and suicide (Kay & Shipman, 2014). Understanding the relationship between physical activity and body image, particularly within two similar body compositions, can help to better understand how body image can be improved. I aimed to explore this relationship and better understand how physical activity impacts body image among those who have similar body compositions.

In Chapter 2, I will begin by restating the problem and purpose of the study. I will review the current literature on this topic to establish the relevance of the research problem. I will conclude the literature review with theoretical support related to the research question.

Chapter 2: Literature Review

Introduction

Gaps exist in the literature with regard to comparing body image within like body compositions based on physical activity levels. Physical activity positively affects body image, but the extent to which it will differentiate body image perspectives among two young adult women with like body compositions is not known (Colman & Dave, 2013). With the increasing presence of body image distortion, body image can be as important as body composition in contributing to one's overall health (CDC, 2015).

Physical activity positively contributes to body composition and body image according to Grogan (2007). Grogan suggested that any exercise lasting longer than 10 minutes will positively affect various factors such as sleep, mood, self-esteem, body composition, and body image. When levels of physical activity are greater and more intense, these benefits can be enhanced (Grogan, 2007). The CDC (2015) recommends adults participate in 150 minutes of moderate to vigorous physical activity each week. In addition, the CDC (2015) recommends strength training for at least 20 minutes, two times each week. These activity guidelines will offer optimal health benefits, two of which being an improvement in body image and body composition. Eighty percent of U.S. adults do not get the recommended amount of physical activity (CDC, 2015). Major depressive disorder affects approximately 15 million U.S. adults, and approximately 5% of these include young adult females (NIMH, 2016). Regular exercise promotes the release of neurotransmitters, endorphins, and endocannabinoids, which are associated with positive feelings (NIMH, 2016). The regular release of these hormones decreases depressive feelings and symptoms,

which can include poor body image (CDC, 2015). I explored the extent to which physical activity can influence young adult women's body image, as compared with someone who is sedentary and possesses a comparable body composition.

The purpose of this literature review is to discuss the theoretical background of how body image is formed; the background of body image and body dissatisfaction; and the relationship between body image, self-esteem, and physical activity. I explore several theories related to the formation of body image, which include the health belief model (HBM), self-discrepancy theory, and self-schema theory. I also explore the research behind body image and its formation. Then I examine the prevalence of body dissatisfaction and body image issues, and their relationship with depression and self-esteem. Finally, I discuss the effect of physical activity on all the aforementioned factors.

Literary Search Strategies

I obtained literature using an online search using PsycARTICLES, MEDLINE, PsycINFO, and medical websites that focused on body image, body dissatisfaction, self-esteem, and physical activity. Key search terms were *body image, body satisfaction, body dissatisfaction, body image distortion, BMI, physical activity frequency, self-esteem, self-worth, self-confidence, female adults, female adolescents, exercise psychology, body composition,* and *perception of body image.* I filtered literature to include peer-reviewed journals, books, and medical websites. I used a date range of 2012 to 2016 with preference, excluding any theoretical literature. A dearth of literature exists related to body image within similar body compositions, relating specifically to physical activity frequency.

Theoretical Framework

Self-Discrepancy Theory

Higgins' (1999) self-discrepancy theory states that people judge themselves using standards known as self-guides. Self-guides are formulated from the three domains, which include ideal, actual, and ought. The discrepancy present is the gap between any two of these judgements. When these guides contradict themselves, a more negative body image can occur. People are motivated to minimize the gap and improve upon the negative emotions related to body image that are present due to the discrepancy (Higgins, 1999).

Of the three domains, the actual self represents the attributes an individual believes them self and others feel they truly possess (Higgins, 1999). This is translated into one's self-concept. The ideal self reflects the attributes one would like to possess, and those they feel others would like them to possess. This is generally the domain that inspires the greatest change within individuals to amend and obtain certain attributes. The ought self refers to attributes that the individual or others feel should be possessed (Higgins, 1999).

There are also two different vantage points discussed in this theory, which include the *own* and the *other* (Higgins, 1999). The own refers to one's self, and the other refers to someone significant. When a discrepancy is present between the own and the other, negative outcomes are present and/or positive outcomes are absent. When a discrepancy is present in the actual domain, actual own vs. actual other, this can result in an identity crisis. When present within the ideal domain, actual own vs. ideal own or actual own vs. ideal other, this negatively impacts self-esteem. When present within the ought domain, actual own vs. ought

other or actual own vs. ought own, agitation related emotions tend to be present (Higgins, 1999).

The capacity to be self-discrepant depends on the extent to which one's perceptions of their attributes conflict (Higgins, 1999). Attributes are individually compared as actual/own vs. ideal/own and are either closely matched or mismatched. The greater the disparity between the two, the greater the self-discrepancy. The greater the discrepancy, the greater the accompanying negative emotions and outcomes (Higgins, 1999).

Heron and Smith (2013) performed a study to measure body image discrepancy and its effect on depression and anxiety in young adult women. This study was one of the first to empirically explore these relationships within the daily life of women. The predictions of the self-discrepancy theory were supported such that those with a discrepancy between the actual ideal and actual ought experienced greater levels of anxiety and depression in their everyday life compared to those with little to no discrepancy (Heron & Smith, 2013). This study explored the relationship between body dissatisfaction and negative mood related to discrepancies, which provided for a better understanding of the development, treatment, and maintenance of body dissatisfaction and relative eating disorders (Heron & Smith, 2013).

Watson, Bryan, and Thrash, (2014) tested self-discrepancy theory to examine the effect of decreasing ideal and ought images. Participants completed three questionnaires related to depression, self-concept, and anxiety before undergoing several hours of psychotherapy. They completed the questionnaires after therapy and the results concluded that decreases in real ideal and real ought were associated with a decrease in depression and anxiety. Decreases in overall discrepancies resulted in an increase in actual image and

decreases in ideal and ought images. These findings supported the use of self-discrepancy theories in future research (Watson, Bryan, & Thrash, 2014).

When applying the self-discrepancy theory to body image, any gap or contradiction present could result in a negative body image (Higgins, 1999). If one feels they are different from what they would like to be, or from what someone of value would like them to be, this will reflect negatively on their body image. Knowing that a negative body image can result in less physical activity, the greater the discrepancy, the less active one may be (Fisher, 2014). Similarly, the less active one may be, the less ideal their body image will be (Fisher, 2014). Therefore, if someone is sedentary, this could contribute to a greater discrepancy in any of the three domains (Higgins, 1999). As several studies have supported, reducing the discrepancy, and/or increasing the strength of the ideal image can reduce feelings of depression and anxiety.

Self-Schema Theory

Similar to Higgins' (1999) self-discrepancy model, Markus's (1977) self-schema theory suggests that women have three reference points to define their perceptions of their appearance. These points of reference include the socially represented ideal body, the objective body, and the internalized ideal body. The media and important peers in one's life can be most influential in the socially represented ideal body. This ideal is derived from what is expected by society, which can differ depending on a number of circumstances, but is primarily determined by culture. The objective body relies on one's own evaluation of their body. This includes one's satisfactions and dissatisfactions with their appearance. The internalized ideal body involves the endorsement of an ideal image and a desire to attain it.

This can often compare to their socially ideal image, if realistic. This can also vary drastically from their socially ideal image if attainment is not realistic (Markus, 1977). When the discrepancy between objective and internalized ideal body image is too large, body esteem can then be more negatively impacted.

This theory highlights the importance of culture with regards to body image. What is ideal will vary drastically depending on one's culture, which has been highlighted throughout history. Grogan (2007) discussed the many cultural and historical norms that have evolved in time. There was a time when women who had excess weight were seen as fertile and nourishing. Presently, this body type might not be seen so beautifully where social media is incessantly exuding a size zero as the model type (Grogan, 2007). Cultural norms dictate what is considered ideal within one's internalized, social, and objective ideals (Markus, 1977).

A study by Sands and Wardle (2003), which adapted Markus' (1977) theory, looked at body dissatisfaction based on internalized ideals. This research found that body dissatisfaction becomes apparent as early as the age of 9 in females (Sands & Wardle, 2003). This study found that this related to the internalization of a thin ideal based on exposure to print and media. Body dissatisfaction had a positive relationship with body mass index. The internalization impacted the association among awareness of sociocultural standards and body dissatisfaction. This concluded that internalization, specifically related to sociocultural standards, is an integral component of body image and body dissatisfaction in females. This

is particularly true at a young age, and therefore, this research finds young females to be a suitable target for preventative strategies (Sands & Wardle, 2003).

Fisher (2013) discussed the factors that contribute to participating in physical activity. With males, body dissatisfaction is associated with an increased motivation to participate in physical activity. In females, the opposite is true. When females feel dissatisfied with their body, they are less likely to be physically active (Fisher, 2013). It is clear that there are many health benefits from being physically active, but that is not necessarily what drives participation for some. For many, body image is what drives physical activity (Fisher, 2013). Drawing from the theories discussed, perceived benefits and ideal (own or other) body image can play a role in the participation of physical activity. With that, the perceived benefits are obtaining an improved body and body image.

Health Belief Model

The Health Belief Model (HBM) was constructed to predict and explain health behaviors (Rosenstock et al., 1988). The HBM is intended to predict an individual's engagement in a variety of health related behaviors based the individual's beliefs and attitudes (Rosenstock et al., 1988). Among the many health related behaviors encompassed within this theory is physical activity. One facet of this model is to look at perceived severity; a subjective analysis and assessment of the severity of certain health problems and the possible consequences present. If one presumes a health problem is severe, they will be more likely to participate in behaviors to reduce the severity of the problem. In contrast, the less severe one views a health problem, the less likely they will be to intervene in an attempt

to mitigate risk. Perceived susceptibility is another layer of this model, and refers to a subjective analysis and assessment of the potential risks for developing a health issue. The more susceptible one feels they are to developing a health issue, the more likely they are to participate in behaviors to reduce that risk. The combination of perceived seriousness and perceived susceptibility is referred to as perceived threat. The HBM suggests that the higher the perceived threat, the greater chance of health-promoting behaviors (Rosenstock et al., 1988).

Health related behaviors can also be impacted by perceived benefits and perceived barriers (Rosenstock et al., 1988). If one feels there is value in the engagement of the behavior, this increases the likelihood of participation in that behavior. If one feels the barriers present outweigh the benefits, the chances of participation in the health behavior decrease. There are several other variables that can contribute to health behaviors, such as demographics, environment, and psychosocial variables. These variables can affect perceived threat, benefits, and barriers according to the HBM. The HBM also suggests that a prompt is necessary for inducing participation in behaviors promoting health. These can range from intrinsic (physical pain) to extrinsic (the media). Self-efficacy was eventually included in the HBM because developers of this theory believed that confidence in one's ability to successfully make changes and improvements was integral in health behavior change (Rosenstock et al., 1988).

According to Green and Murphy (2014), there are many factors involved in one's decision to engage in physical activity. With respect to the HBM, if one has high perceived

threat with a condition that can be prevented by exercise, he or she may be more likely to participate in physical activity. If one feels the benefits of physical activity outweigh the barriers, he or she will be more likely to be physically active. Physical activity has been linked to reduced risk for a plethora of diseases, both psychological and physical. Physical activity has also demonstrated to improve sleep, mood, self-esteem, and body image. However, in addition to the many benefits physical activity can produce, it has been reported as difficult, time consuming, and unrealistic. According to the HBM, one's perceived benefits must overshadow the perceived barriers in order for an individual to participate in physical activity (Green & Murphy, 2014).

Poor body image and low self-esteem have been reported as reasons not to participate in physical activity (Green & Murphy, 2014). These factors have been associated with low motivation, embarrassment in social settings (gyms), and feeling too far gone. Similarly, a more ideal body image is linked to increased physical activity. There is no way to isolate which is the cause and which is the effect, but the trends are positive in both associations (Green & Murphy, 2014). Knowing this, the perceived benefits of obtaining an improved body composition and/or body image will result in more frequent physical activity (Green & Murphy, 2014). The perceived benefits of physical activity will similarly result in a more ideal body image (Green & Murphy, 2014).

Wills (2015) used the HBM in research on overweight adults. This study discussed the normalization of obesity within our country during the last decade. This normalization was associated with an increase in prevalence and has contributed to a decrease in perceived

susceptibility as it relates to the HBM. Recognition of the problem is a key component in this model as it translates to recognizing the perceived threats. Without this recognition, perceived benefits are less recognizable and less sought after. Within this study, perceived barriers and perceived benefits were the greatest predictors of behavior change, but perceived susceptibility and perceived severity were not as significant of predictors. This showed that many participants did not perceive severity in their condition and did not feel susceptible to the risks involved in being overweight. Within the perceived barriers, psychological barriers and environmental barriers were the most significant reason for a lack of physical activity (Wills, 2015). Similar to Grogan and Murphy's (2014) study, these barriers included low motivation, embarrassment in social settings, and feeling too far gone.

Body Image Determinants

Body Image

A book by Schilder (2013) dives into the physiological components of body image. According to Schilder (2013), body image referred to the picture of one's own body that is seen in the mind. In other words, the way the body appears to oneself. In addition to this, there were several variables that contributed to what is ultimately perceived with regards to body image. This includes sensations and what is visualized on the body's surface. Also tactile, thermal, and pain impressions. There were also muscular and visceral sensations that contribute to this image. All of this contributed to the feeling of unity within the body, which was ultimately known as bodily schema (Schilder, 2013).

Schilder (2013) stated that the term bodily schema suggested that body image was not only comprised of imagination and sensation, but also self-appearance (Schilder, 2013). Self-appearance reached beyond perception, although encompassing mental pictures and representations. This involved past impressions that influenced mental pictures, and generally occurred outside of central consciousness. The physiological components of body image were vast and complex, which made it difficult to concisely understand all that contributes to the formation of body image (Schilder, 2013).

The National Eating Disorders Association (NEDA, 2015) stated that body image is the perception one has of their physical self, but more importantly, the thoughts and feelings associated with that perception. The NEDA (2015) suggested there were four aspects of body image, which included perceptual, affective, cognitive, and behavioral. Perceptual referred to the way one see's oneself. Affective referred to the way one felt about the way the look. Cognitive involved the thoughts and beliefs behind one's feelings of their body. Last, behavioral related to the things one does in relation to the way they look (NEDA, 2015).

Development of Body Image

Body image becomes identifiable in early childhood (Smolak, 2004). By the age of 4, a child's self-concept begins to form (Fisher, 2014). This is when children of different races start to become aware of their differences (Schilder, 2013). Parental restrictions on eating can start to have an impact, and parental and peer comments begin to become internalized. At the age of 6, children start to develop more negative and positive ideals.

Negative values are associated with differences and disabilities, and unappealing features and sizes are distinguished (Fisher, 2014; Schilder, 2013).

Between the ages of 8-10, gender differences become apparent and the importance of appearance is apparent (Fisher, 2014). The importance of appearance has been present in females more so than males. Negative comments and harassment generally start, and this translates to negative self-esteem issues. At this age, children start to interpret others' opinions as reality (Fisher, 2014).

Between the ages of 11-14, puberty begins to develop and starts to define gender differences more drastically (Fisher, 2014). Self-esteem plays a big role at this stage if biological development does not align with social ideals. Objectification begins and this often leads to body dissatisfaction. This is the stage where dieting and other methods of body alteration begin to emerge (Schilder, 2013). Beauty is heavily defined by individuals' community, media, friends, and family (Fisher, 2014; Schilder, 2013).

Size prejudice referred to expectations of culture, and specifically American culture in this study (Fisher, 2014). Current research supports the notion that a major emphasis is placed on weight, height, size, and appearance. This culture often equates appearance with self-worth. For example, being muscular can equate to being hard working, while being overweight can equate to being lazy. This has often been perpetuated by other factors, such as the media, peers, and family (Fisher, 2014).

The media can be to blame for determining and perpetuating what is considered 'normal' (Boyd, 2014). The media is pervasive in so many ways today through television,

radio, internet, etc. It was estimated that roughly 95% of adolescents between the ages of 12-17 were online and connected in some way to social media. From a very young age, females were introduced to Barbie like figures, and males to Hulk and GI Joe figures. These figures embed a message of familiarity and normalcy in relative appearances from a young age (Boyd, 2014). Several experimental and correlational studies report exposure to the thin ideal in mass media contributes to body dissatisfaction and internalization of a thin ideal (NEDA, 2015). Similar research suggested that the emphasis from mass media to be lean and muscular also appeared to contribute to body dissatisfaction in men (NEDA, 2015).

According to Fisher (2014), the environment one comes from and is immersed in has a large impact on expectations. Family, friends, and other valuable peers have a big influence on body image ideals (Fisher, 2014). Fisher (2014) suggested that the positive and negative feedback received from peers begins to internalize around the age of 4. This ideal usually starts within the home at an early age and extends to peers and romantic partners (Fisher, 2013). Depending on the environment, different pressures and ideals are present (Groban, 2007). For instance, athletic teams expect a muscular and lean physique (Groban, 2007). Environments with warmer weather encompass an expectation to wear less clothing, which favors a more petite build (Groban, 2007). Romantic interests can influence striving for different ideals as well (Groban, 2007). Also, abusive relationships have been linked to a more negative body image (Fisher, 2014).

There are also visible gender differences among ideals (Groban, 2007). When males and females were asked to illustrate what they found ideal in themselves, this image

differed. Men tended to focus on muscular tone, while women tended to focus on thinness. When asked to illustrate what was attractive in a romantic partner, this differed within women more so than men. In other words, women often inaccurately illustrated what they felt men found attractive. Women had the impression that men prefer them to be thinner than what men actually expressed (Groban, 2007). No matter what shapes the ideal, the discrepancy between what is ideal and what is perceived as reality is often the root of body dissatisfaction (Higgins, 1999).

Positive and Negative Body Image

According to NEDA (2013), positive body image refers to one who sees oneself for what they are. Following this, they accept and appreciate what they are. Those who have a more positive body image were less influenced by what others thought, by what they felt they *should* look like, and by projected norms and ideals (NEDA, 2015). Those with positive body image generally did not align the way they look with their self-worth. Positive body image was often associated with higher levels of physical and psychological health. Positive body image reflected in greater self-esteem, greater self-acceptance, and a healthier outlook. All of these contributed to healthier behaviors (NEDA, 2015).

According to NEDA (2015), negative body image is present when one has negative thoughts and feelings about their own body. This generally leads to body dissatisfaction, and can stem from a variety of variables. Some populations and circumstances make it more likely to develop a negative body image. For instance, young adult women can be highly susceptible due to hormonal and pubertal changes in the body (NEDA, 2015). Females were

more prone to negative body image issues than males, although males are becoming increasingly susceptible (NEDA, 2015). Those with low self-esteem and depression were at risk for negative body image (NEDA, 2015). Some personality traits often align with negative body image as well, according to Rosen (2013). These include perfectionism, high achievers, those who internalize, and those who compare themselves to others (Rosen, 2013).

Body Dissatisfaction

When one possesses an ideal body image that differs from his or her actual body image, this discrepancy usually contributes to body dissatisfaction (Higgins, 1999). Body image issues are present in roughly one out of every three children as they enter the adolescent stage (Erickson, Robinson, Haydel, & Killen, 2000). Much of this comes from the fact that roughly two out of every three Americans are overweight, and this statistic is inclusive of children and adolescents. Also, being overweight is the main reason for body dissatisfaction (Erickson, Robinson, Haydel, & Killen, 2000). Fallon, Harris, and Johnson (2014) looked at the prevalence of body dissatisfaction in U.S. adults. Results indicated that the range of body dissatisfaction in women was between 12.4% and 31.8%. Compared to the previous assessments of prevalence, the percentage of women who experienced body dissatisfaction had increased significantly over time (Fallon et al., 2014).

A meta-analytic review discussed reports of body dissatisfaction among heterosexual men and women, and homosexual men and women (Morrison, Morrison, & Sager, 2004). Of these classifications, no race was excluded. The review found that heterosexual and gay

women reported greater body dissatisfaction than heterosexual and gay men. The factors associated with impacting body image were vast, but some included the media, cultural relativity, age, environment, sex, and genetics. Each group had different factors that were most influential in determining their body image. For instance, the media was a greater factor for women than it was for men. Feeling attractive and muscular were greater factors for men than women (Morrison et al., 2004).

A study by Bucchianeri, Arikian, Hannan, Eisenberg, and Neumark-Sztainer (2013) revealed that over a 10 year longitudinal examination, body dissatisfaction increased from middle to high school, and increased furthermore from high school into young adulthood. This increase was most impacted by an increase in BMI, as when BMI was controlled, this trend was nonsignificant. These results emphasized the need for targeted intervention during these transitions, particularly the transition from high school to young adulthood (Bucchianeri, et al., 2013).

Schneider et al. (2013) assessed the predictors, scope, and patterns regarding feelings of body dissatisfaction within female adolescents. Participants were prompted to approximate their actual body image, the body image desired, and the body image they assumed their significant peers and family members considered to be ideal. Findings showed that the individual ideal reported was significantly thinner than their reported actual body image. Those who participated in an esthetic sport reported significantly lower body dissatisfaction. Negative comments related to body image made by parents, smoking, lower social status, and increased rates of TV viewing were significantly associated with body

dissatisfaction. These findings suggested targeting these specific populations with interventions to improve body image (Schneider et al., 2013).

Ferguson (2013) explored the relationship between the media's thin and muscular ideals on body dissatisfaction. This research suggested that the media had a significant effect on women who have pre-existing body dissatisfaction, but less of an effect on women who do not experience body dissatisfaction. Ferguson (2013) identified that social media use was linked to peer competition, which had an indirect effect on body related outcomes. Rodgers, McLean, and Paxton (2015) found that internalizing the media's ideal preceded and predicted appearance comparison. With this, body image interventions targeting the internalization of what the media has constructed as ideal, and social comparison among those suffering from body dissatisfaction, would likely make an impact.

When it comes to body dissatisfaction and ethnicity, historically, White women tend to report greater body dissatisfaction than women of color. In a meta-analysis by Grabe and Hyde (2006), body dissatisfaction was compared in Asians, Americans, Blacks, Hispanics, and White women. White women were most dissatisfied, but the difference was small. This research confronted the belief that significant differences in body dissatisfaction exist between White women and women of color. These findings suggested that body dissatisfaction existed in women of all color.

Risks of Body Dissatisfaction

Body dissatisfaction is a primary determinant of eating disorders and has been associated to a variety of other chronic diseases (Fallon et al., 2014). The increase in other

chronic diseases is related to a variety of factors involving body composition as well. Those who have body dissatisfaction are less likely to screen for cancer, perform self-exams, and are more likely to smoke (Fallon et al., 2014).

It is not usually until adolescence that negative repercussions of body dissatisfaction start to become apparent (Fisher, 2013). This can come in the form of eating disorders, depression, and suicide (CDC, 2015). Eating disorders are the third most prevalent chronic illness within adolescent females (Golden et al., 2004). According to NEDA (2015), the three main types of eating disorders include anorexia nervosa, bulimia, and binge eating. Most often these conditions are associated with extreme emotions, attitudes, and behaviors revolving around body image issues. A recent study revealed that nearly a half a million adolescents between the ages of 15-18 suffered from some type of eating disorder (Rosen, 2013). Eating disorders can be life threatening and often result in hospitalization and other forms of medical treatment for recovery (CDC, 2015).

One study had indicated that by the age of 14, roughly 10% of adolescents had experienced at least one bout of depression (Reynolds, 2010). This increased by 5% over the ages of 15-18. In females, one of the most prevalent self-reported sources of depression was body dissatisfaction (Reynolds, 2010). Adolescent females between the ages of 15 to 18 were the most susceptible to suffering from depression, eating disorders, and other body dissatisfactions (Kay & Shipman, 2013). This population was also most frequently attempting to alter their bodies through dieting, surgery, exercise, and pills (Reynolds, 2010).

Body Image Distortion

Body dissatisfaction does not always relate to one's actual body composition (Slade, 2004). Body dissatisfaction refers to how one *feels* about their body, and most adolescents associate their feelings to how they appear, more so than what their body composition displays (Slade, 2004). Although optimal body composition readings more often result in optimal body image, this is not always consistent. When there is an inconsistency, body image distortion (BID) may be to blame (Slade, 2004).

When it comes to BID, this is heavily studied in clinical settings (Slade, 2004). Generally speaking, within clinical research, body image is often studied within three main areas (Slade, 2004). The first involves neurological disorders, where one has a faulty perception of his or her own body. The second area of research involves BID. This involves those who have an eating disorder/weight disorder. The final area of study involves those who have a delusional misperception of their body, and this is known as body dismorphophobia. In each of these areas, misperception of the body exists. This field emphasizes the fact that body image is primarily a perceptual phenomenon (Slade, 2004).

With the understanding that body image is perceptual, it can be argued that one's body composition *could* have a negligible impact on what is actually perceived (Gaudio & Quattrocchi, 2012). There were cases where obese women perceive themselves as average and healthy (Gaudio & Quattrocchi, 2012). More commonly, there were cases where anorexic women perceive themselves as overweight (Gaudio & Quattrocchi, 2012). In any of these distorted cases, actual body composition did not have the impact on perceptions that perceived body image did (Gaudio & Quattrocchi, 2012).

Physical Activity, Self-Esteem and Body Image

Considering all of the negative repercussions that can arise from body dissatisfaction, understanding factors that can contribute to increasing one's body image can combat the development of these negative repercussions. One of the most validated forms of increasing one's body image is through physical activity (Buckworth, 2013). Research has concluded that the relationship between the two is positive no matter which variable is independent. In other words, a heightened body image resulted in an increase in physical activity, and an increase in physical activity resulted in an improved body image (Buckworth, 2013).

Physical activity has proven health benefits, and some of these include: improved sleep, improved mood, decreased chance for chronic illness, improved social status, increased energy, better academic performance, and life span (Colman & Dave, 2013) There are countless benefits, but one of the strongest correlations is the positive impact it has on one's self-esteem and confidence. Physical activity has consistently been linked to an increase in self-esteem and confidence (Hubbs, Doyle, Bowden, & Doyle, 2012). There are several reasons for this, one being the positive hormonal influx of endorphins. Another relates to the improvements in body composition, which can lead to improvements in body image. Regardless of the contributing factors, based on a breadth of research, a generalization can be made that physical activity improves one's self-esteem (Hubbs et al., 2012).

High self-esteem has often correlated with a more positive body image (Carlock, 2013). Those who had a more positive body image were more likely to participate in physical activity when compared to those with a more negative body image (Buckworth, 2013). For this reason, self-acceptance has often been promoted by Sports Psychologists no matter the shape or size, because participants should be proud of participation regardless of the potential outcomes (Buckworth, 2013). According to Buckworth (2013), body image has also had an effect on the type of activities people were willing to participate in. Those who had a more negative body image tended to prefer exercising alone (Buckworth, 2013). Maintaining a routine was more likely when working out in social groups and settings, however, which was another reason to promote self-acceptance. For those who do not feel ideal, it was suggested to think and talk positively and to focus on health, not projected ideals (Buckworth, 2013).

Research has found that what is necessary to feel psychological benefits of exercise, including that of improved body image, differ greatly from what is necessary to feel physical benefits (Campbell & Hausenblas, 2009). As mentioned, the physical benefits are well understood, but this phenomenon emphasizes the importance of understanding the psychological benefits. It was found that a simple bout of exercise resulted in the same body image improvements as seen in those who exercise 30 minutes a day, five days a week. This was groundbreaking as it displayed the power in a simple act of physical activity and its effect on body image (Campbell & Hausenblas, 2009).

When males and females were polled on what makes them feel most confident and self-worthy, females most often chose being attractive, and males chose financial success (Kay & Shipman, 2014). Similarly, when females and males were assessed on what makes them feel most insecure, females chose body dissatisfaction. Males did not associate their self-esteem and self-worth with their body image as frequently as females did. Since females align their physical attractiveness most strongly with their self-esteem and self-worth, physical activity can help females improve the factor they rely on most to feel worthy (Kay & Shipman, 2014).

Summary

Body image refers to a multitude of factors that contribute to how one see's oneself (Fischer, 2013). Positive body image refers to one seeing oneself for what his or she truly is, and appreciating that perception (Schilder, 2013). Negative body image refers to the association of negative thoughts and feelings toward one's body (NEDA, 2015). Negative body image often results in body dissatisfaction, and body image issues can begin to develop around the age of 4 years old (Smolak, 2004). Between the ages of 15-18, particularly in females, the incidence of these issues are at their peak (Fisher, 2013). As a result, the prevalence of low self-esteem, eating disorders, depression, and other negative behaviors and conditions are heightened in this population (Kay & Shipman, 2014). Physical activity has been proven to increase body image, but it is not well known how it impacts those of similar body compositions (Colman & Dave, 2013).

Chapter 3: Research Method

Introduction

The purpose of this study was to explore the difference in body image within similar BMI categories, based on physical activity frequency, among 18- to 20-year-old females. The results from this study could be helpful in identifying the extent to which physical activity can influence body image, and, in turn, help to better understand the influence of this body image determinant. This information could help to decrease incidences of body dissatisfaction and BID, which could help to decrease the prevalence of eating disorders, depression, and other negative behaviors and conditions resulting from body image issues. In this chapter, I will cover the research design and rationale, methodology, and threats to validity.

Research Design and Rationale

I used an online survey research method to collect data from females between the ages of 18 to 20 years. The independent variables were BMI and physical activity frequency. The dependent variable was body image. BMI was self-reported by participants entering their height and weight, which I converted into BMI through the formula generated by the CDC. I grouped BMI categories according to the CDC's underweight, normal weight, and overweight percentile chart for female adolescents ages 2 to 20 years: Category 1 = 17-20, Category 2 = 21-23, and Category 3 = 24-29, respectively. Physical activity frequency can be defined as how often one participates in physical activity per week, and I assessed this using the RAPA (Health Promotions Research Center [HPRC], 2006). The RAPA has established validity and reliability to assess average activity level. Based on markings within

the assessment, I assigned participants to one of the following categories: 1 = sedentary, 2 = underactive, 3 = underactive (light), 4 = underactive (regular), or 5 = active. I combined categories 1, 2, and 3 to form one underactive (light) category to strengthen the power of the ANOVA *F* tests. *Body image* can be defined as how one see's oneself and I assessed this using the BISS (Cash et al., 2002). This assessment has established reliability and validity, and assessed participants' perceived image, as well as ideal image, which based on the instrument's scoring instructions, generated an overall assessment of body image. Based on markings within the assessment, I assigned participants to one of the following categories: 1 = extremely dissatisfied, 2 = mostly dissatisfied, 3 = moderately dissatisfied, 4 = slightly dissatisfied, 5 = neither dissatisfied nor satisfied, 6 = slightly satisfied, 7 = moderately satisfied, 8 = mostly satisfied, and 9 = extremely satisfied. I obtained and categorized the mean of both physical activity and body image, and results were compiled to determine if there were differences in body image among 18- to 20-year-old females with similar body compositions who differed in physical activity frequency.

Surveys are an efficient method of data collection when performing an analysis of variance (Wright, 2005). They are useful in reaching a large pool of participants from a variety of geographical locations. They are easily accessible for participants with internet access and are useful for the privacy and anonymity of participants (Wright, 2005). Surveys are also useful when disseminating questionnaires, scales, and other solicited written information from participants. Overall, many researchers rely on the use of surveys to gather and analyze quantitative data (Allen et al., 2010; Wright, 2005).

Research Question and Hypotheses

What is the difference in young adult women's body image within similar BMI categories who differ in physical activity frequency?

$H_0$1: There is no significant difference in young adult women's body image, as measured by the BISS, within similar BMI categories between those who are more physically active and those who are less physically active, as measured by the RAPA.

$H_1$1: There is a significant difference in young adult women's body image, as measured by the BISS, within similar BMI categories between those who are more physically active and those who are less physically active, as measured by the RAPA.

Methodology

Population

The participants were a convenience sample of 161 adult females 18 to 20 years of age. Participants attended a community college in the Southwestern U.S. This age was used because the prevalence of body image issues are at their peak during late adolescents and early adulthood (Kay & Shipman, 2014).

Sampling and Sampling Recruitment

To participate in this study, participants must have been female and 18 to 20 years of age. Participants were students presently enrolled in community college. Participants were solicited via email and/or course announcements. This email included a solicitation message and a link that directed participants to the study hosted by SurveyMonkey. Once clicking on the link, the informed consent was presented. Once clicking 'I Agree,' participants were taken to a page to confirm sex (female) and age (18-20 years), as well as enter height and

weight, which was converted into BMI (Appendix A). The following page included the BISS, which has a total of 6 scales to assess body image. Following that page, the RAPA, was presented. First, an image of examples was provided to outline intensity levels so participants could accurately categorize their activity bouts. Below the image were 7 questions to assess physical activity frequency. Finally, the last page included a thank you message for participants. A copy of the survey can be viewed within Appendix A.

Participants who had a BMI score below 17 and/or above 29 were excluded to focus on only three categories that included Underweight, Normal weight, and Overweight.

Power Analysis

A one-way ANOVA was performed to evaluate the means of each body image category, based on the means of physical activity categories, to determine if there was a difference in body image within BMI categories. A sample size of 161 was used to achieve a power of .80, which was based on a power analysis using G*Power (IBM SPSS, 2014). A large effect size of .5 was used and was determined based on the assumption that physical activity would have a large impact on body image (Aguinis et al., 2001; Aguinis et al., 2005; Cohen, 1988).

Procedures for Recruitment, Participant, and Data Collection

In order to participate in the study, participants must have been female and 18 to 20 years of age. Participants were students presently enrolled in community college. Participants needed to have internet access.

Participants were asked to complete the survey anonymously and were not asked to provide identifying information such as their name or address. Participants were required to accept informed consent before the start of the survey by acknowledging the risks, benefits, and responsibilities of participation. Participants were able to skip questions and exit the survey at any time by closing their browser.

This study used two standardized instruments: the RAPA (HPRC, 2006) and the BISS (Cash et al., 2002). A demographic questionnaire was provided in addition to the standardized instruments through SurveyMonkey. The website link to the survey was provided to all participants via email and/or course announcement. Results were compiled through SurveyMonkey and transferred to IBM SPSS version 21.0 software for data analysis.

Instrumentation and Operationalization of Constructs

Demographics *(*Appendix A*).* A brief demographic questionnaire was administered to obtain participants' age, sex, and ethnicity. Participants were asked to confirm an age of 18 to 20 years and that they are female. Names and other demographic information were not collected.

Body Mass Index *(*Appendix B*).* BMI was measured through self-reported height and weight. This information was converted into BMI through the formula provided by the CDC. This formula is: weight (lb) / [height (in)]^2 x 703. The BMI determined the category in which participants were grouped: category 1: 17-20 [<10th % - 25th %], category 2: 21-23 [50th %], category 3: 24-29 [85th % ->90$^{th\ \%}$]. These categories were determined using the

intervals designated by the CDC as Underweight, Normal weight, and Overweight, respectively. These categories defined what was considered same and/or like BMI scores.

Body Image States Scale. The BISS is a 6-item measurement designed by Cash et al. (2002) to measure one's evaluative/affective body image during specific states (see Appendix A). According to Cash et al. (2002), the BISS is acceptably internally consistent and appropriately correlated with various trait measures of body images. Construct validity has been established by an experiment on differential reactivity to appearance related information (Cash et al., 2002). A test-retest coefficient of .69 was obtained when using this scale on females (Cash et al., 2002). Studies that have utilized the BISS suggest it is unique and useful in assessing body image in both the research field and clinical setting (Cash et al., 2002).

Questions within the BISS include the following response scales: 1 = extremely dissatisfied, 2 = mostly dissatisfied, 3 = moderately dissatisfied, 4 = slightly dissatisfied, 5 = neither dissatisfied nor satisfied, 6 = slightly satisfied, 7 = moderately satisfied, 8 = mostly satisfied, and 9 = extremely satisfied. Participants were asked to assess how they feel about the following at the present moment: physical appearance, body size and shape, and weight. Also, attractiveness and unattractiveness will be assessed as *extremely, very, moderately, slightly,* or *neither attractive nor unattractive*. Next, participants were asked to choose how they feel about their physical appearance right now as compared to usually, and how they look compared to the average person, with the following scales*: a great deal worse, much worse, somewhat worse, just slightly worse, about the same, just slightly better, somewhat*

better, *much better*, or *a great deal better*. The mean of rankings were collected and participants were assigned an overall body image rank of 1-9, with 1 being *negative body image* to *9* being *positive body image*.

Rapid Assessment of Physical Activity. The RAPA was designed by the HPRC (2006) to provide clinicians with a tool to rapidly assess levels of physical activity within adults (see Appendix A). This assessment has established reliability and validity with a test-retest correlation of .65 (HPRC, 2006). The RAPA has been an efficient alternative to measure physical activity levels compared to longer questionnaires (UWHPRC, 2006). The RAPA was designed for elder adults, but has been adapted to apply to any adult eighteen years of age or older (HPRC, 2006). This assessment is useful in determining activity frequency and intensity in a rapid time frame (HPRC, 2006).

Participants were asked to report the frequency and intensity of their physical activity in a series of 7 yes or no questions. An image was provided to outline categories of intensity before prompting responses to questions about frequency. Questions progressively increased in frequency and intensity, so the assessment took the highest number that received a yes as the scoring category. For instance, if questions 1-5 were a yes, and questions 6-7 were a no, the participant's category score would be a 5. If questions 1-5 were a yes, question 6 was a no, and question 7 was a yes, the participant's category score would be 7. Overall, participants were assigned to a category of 1-5, since activity levels with a score of 6-7 were grouped in category 5, per the scoring of the assessment. This assignment resulted in the following categories: 1 = sedentary, 2 = underactive, 3 = under-active

regular–light activities, 4 = under-active regular, and 5 = active. Categories 1-3 were later combined to form three total categories: Underactive regular-light, Underactive regular, and Active.

Data Analysis

IBM SPSS software version 21.0 was used for analysis of the data collected for this research. Data was first analyzed with standard descriptive statistics such as means, standard deviations, frequencies, and percentages, as appropriate.

To examine the hypothesis, an ANOVA was run to determine if there were any significant differences in body image between each of the three BMI categories based on physical activity frequency. Differences in each BMI category were compared based on the assigned physical activity categories as determined by the RAPA.

Threats to Validity

The purpose of this research was to determine whether there was a significant difference in body image among different BMI categories, and if so, the impact of physical activity frequency on body image. Internal validity looks at the relationships of other variables within the study. To conclude internal validity, it is important to control for any unnecessary variables (Heiman, 2001). Strengthening the internal validity aids in the results depicting either a positive or negative relationship between variables. One threat present within this analysis was the use of the ANOVA with only physical activity as the variable of focus. Obtaining a large sample size of participants based on a G*Power calculation was meant to reduce the likelihood of this threat to validity.

External validity refers to the extent to which the study represents the desired population and situation (Heiman, 2001). In order to maintain strong external validity, it is important to select participants from a specific population and situation (Heiman, 2001). This study included 18- to 20-year-old female participants from a Southwestern U.S. community college. This study used an online survey, which required that participants had access to the internet. Participants were located anywhere in the United States, as some students were solely virtual. With that, the pool of participants was not limited to any one location. This survey was accessible any day and at any time, so time of completion was not controlled.

Threats to validity included, but were not limited to, the length of the study, race, sex, participants' interpretation of how to complete the instrument, and participants neglecting to complete all of the survey. Considering the data was collected over the internet, technical issues could have been a threat. Participants may have had different interpretations of the instructions and descriptions. Participants could have interpreted questions differently and/or different from what they were intending to ask. Directions for completion and content of questions were stated as clear as possible to minimize any confusion or subjectivity. Social desirability bias could have been present as participants may not have been honest with responses. This was addressed with a request to be as honest as possible with reassurance that participation was anonymous.

Ethical Procedures and Protection of Participants

Approval to conduct this study was obtained by the IRB at Walden University (Approval # 02-23-17-0353527) and the participating community college. Approval was advertised within the survey to participants. Participants were female and 18 to 20 years of age. Participation was voluntary. All participants had the option to exit the online survey at any time. Participants were not asked their name or any other personal identifying information.

Data were collected through SurveyMonkey. SurveyMonkey uses Security Sockets Layer encryptions to protect data transmitted over the internet and has security mechanisms to minimize the likelihood of data breaches. The email distribution used to recruit participants included a link to the study, which allowed me to compile results anonymously. The study's survey settings were configured to block IP addresses from being tracked.

Data collection and analysis complied with IRB procedures. All data will be kept on my password protected computer and will be destroyed after dissertation use, which will be 4 years following completion of the study.

Summary

This was a quantitative study using online survey research consisting of a brief demographic questionnaire and two instruments to determine any significant differences in young women's body image among similar BMI categories. Participants were 18- to 20-year-old females who attended a community college in the Southwestern U.S. Participants

were a convenience sample recruited via email and/or course announcement through their educational institution. Data was then collected and results were analyzed using an ANOVA. Categories were compared to determine if there was a significant difference in body image based on physical activity frequency. The study will contribute to the current body of research related to the prevalence and severity of body image dissatisfaction as impacted by physical activity frequency. The results could help better understand the impact of physical activity on body image, and help to mitigate body image dissatisfaction through the promotion of physical activity (Kay & Shipman, 2014).

Chapter 4 will outline the purpose of the study, research question, and instruments used. This chapter will provide descriptive statistics of participants, procedures used for data collection and data analysis, and findings of the analyses.

Chapter 4: Results

Introduction

The purpose of this study was to explore the differences in body image within BMI categories based on physical activity frequency among adult females. I hypothesized that there would be a significant difference in body image, as measured by the BISS, within similar BMI categories between women are more physically active and women who are less physically active, as measured by the RAPA.

In this chapter, I present the results of this quantitative study in which I explored the differences in body image based on physical activity frequency. I also include description of the participants, and how I collected, analyzed, and used the data to answer the research question.

Data Collection

I recruited the participants in this study via email and/or course announcement, and they were students enrolled at a community college in the southwestern U.S. I disseminated a description of the study and a link to the survey to all faculty who taught at the community college via email. I encouraged faculty to distribute the description and survey information to all students enrolled via email and/or course announcement. After 3 weeks, 173 responses were collected; however, only 161 were complete responses. I discarded and excluded data from the surveys that were not complete. Table 1 displays the demographic data from the 161 participants with complete responses.

Table 1

Demographic Characteristics

Characteristic	*n*	%
Age (y)		
18	33	20.4
19	45	28.0
20	83	51.6
Ethnicity		
White	124	77.0
Asian	11	6.8
Black or African American	4	2.4
Other	22	13.6
American Indian and Alaskan Native	0	0
Native Hawaiian or Pacific Islander	0	0

I created a weight category variable for the purpose of splitting the initial data set into three separate categories according to CDC's BMI categories (2015). Table 2 displays the weight categories and respective BMI intervals.

Table 2

Weight Categories

Weight category	BMI interval
Underweight	17 - 20.99
Normal weight	21 - 23.99
Overweight	24 - 29

Note. BMI, body mass index; categories determined by the Centers for Disease Control (2015).

Due to the upper limit for BMI, which was 29, and participants who answered no to all physical activity questions, 28 cases were excluded from the initial data set, which reduced the total sample to 133. The independent variable of primary interest for this study was physical activity, which contained five categorical levels as shown in Table 3.

The dependent variable in this study was body image**,** which was calculated as a composite mean of the six 9-point items from the BISS (Cash et al., 2002). Prior to taking the mean, items 2, 4, and 6 were reverse scored as follows: 1=9, 2=8, 3=7, 4=6, 6=4, 7=3, 8=2, 9=1. Table 3 shows the distribution of frequencies across different weight categories and physical activity categories.

Table 3

Frequencies Across Physical Activity and Body Mass Index Categories

	Underweight	Normal weight	Overweight
Sedentary	1	0	1
Underactive	4	6	2
Underactive regular-light	1	2	4
Underactive regular	8	10	10
Active	25	36	23

Table 3 displays that the valid data set was highly unbalanced with respect to number of responses within each of the physical activity categories. For example, the Underweight category shows only one response in each of the Sedentary and Underactive regular-light categories. The Normal weight category shows no responses in the Sedentary category. Additionally, the number of responses within all weight categories for the Underactive regular-light category are limited and much smaller than the relevant numbers for Underactive regular and Active categories. Although the one way ANOVA procedure was still formally applicable to the above data sets for each weight category, the lack of balance within the physical activity categories caused a decrease in the power of the relevant *F* tests. This is illustrated by the results from the initial ANOVA tests with the above data set provided in Appendix G, which showed no significant effect due to physical activity. The

lack of balance in the number of responses within the physical activity categories was the reason behind combining the data from the lower three physical activity categories to create one new factor. The main goal of this data restructuring was to make the relevant data sets more balanced, which could increase the power of the ANOVA *F* tests. A new factor was created with the following three categories: Underactive-light (Sedentary, Underactive, and Underactive regular-light combined), Underactive-regular, and Active.

Table 4 shows the distribution of the frequencies across weight categories and physical activity categories. Table 4 also shows that the number of responses within physical activity categories are more consolidated as compared to those within original physical activity categories in Table 3.

Table 4

Frequencies Across Physical Activity Categories

	Underweight	Normal weight	Overweight
Underactive-light	6	8	7
Underactive-regular	8	10	10
Active	25	36	23

Table 5 displays the descriptive statistics for body image for each of the weight categories. The average score for body image decreased as BMI increased.

Table 5

Descriptive Statistics for Weight Categories and Body Image

	n	Minimum	Maximum	Mean	Std. deviation
Underweight	39	2.33	8.33	5.0957	1.62548
Normal weight	54	1.00	7.83	5.3065	1.56437
Overweight	40	1.00	6.83	4.1911	1.35378

Table 6 displays the descriptive statistics for body image for each of the physical activity categories. The average score for body image increased proportionately with each activity category.

Table 6

Descriptive Statistics for Physical Activity and Body Image

	Mean	Std. deviation	*n*
Sedentary	2.6667	.	1
Underactive	3.0000	.94281	2
Underactive regular-light	3.0833	2.20479	4
Underactive regular	4.1333	1.02379	10
Active	4.6377	1.20358	23
Total	4.2250	1.35324	40

Results

Overweight Category

A one-way ANOVA was performed on the Overweight category using a general linear model. The descriptive statistics of body image and physical activity are displayed in Table 7.

Table 7

Descriptive Statistics of Overweight Category

Physical activity	Mean	Std. deviation	*n*
Underactive-light	3.0000	1.61303	7
Underactive-regular	4.1333	1.02379	10
Active	4.6377	1.20358	23
Total	4.2250	1.35324	40

The main results from the one-way ANOVA analysis are shown in Table 7.1. Physical activity had a significant effect on body image among women within the Overweight category $F(2,37) = 4.715$, $p = .015$, accounting for 20.3% of the variance in body image.

Table 7.1

Analysis of Variance Results for Overweight Category

Source	Type III sum of squares	df	Mean square	F	Sig.	Partial Eta squared
Corrected model	14.505[a]	2	7.253	4.715	.015	.203
Intercept	483.897	1	483.897	314.583	.000	.895
Physical activity	14.505	2	7.253	4.715	.015	.203
Error	56.914	37	1.538			
Total	785.444	40				
Corrected total	71.419	39				

Note. a. R Squared = .203 (Adjusted R Squared = .160)

Table 7.2 provides information about the observed power of the relevant *F*-test for significance of physical activity. The observed power was 0.755, which was significant for this test.

Table 7.2

Observed Power for Overweight Category

Source	Noncent. parameter	Observed power[b]
Corrected model	9.430	.755
Intercept	314.583	1.000
Physical activity	9.430	.755

Note. Computed using alpha = .05.

The estimates of body image within the Overweight category are included in Table 7.3. This includes the mean, standard error, and 95% confidence interval for each physical activity category.

Table 7.3

Estimates for Overweight Category

Physical activity			95% Confidence interval	
	Mean	Std. error	Lower bound	Upper bound
Underactive-light	3.000	.469	2.050	3.950
Underactive-regular	4.133	.392	3.339	4.928
Active	4.638	.259	4.114	5.162

The assumption for the homogeneity of variances of body image among the physical activity categories were tested using the Levene's test. The results provided in Table 7.4 display the relevant *p* value of 0.665, which indicates that the assumption for the homogeneity of variances was satisfied.

Table 7.4

Test of Homogeneity of Variances for Overweight Category

Levene's statistic	df1	df2	Sig.
.413	2	37	.665

In order to find out which differences in body image means were significant, a post-hoc test with pairwise comparisons was performed. The results are shown in Table 7.5. Since the homogeneity of variances assumption was satisfied, Bonferroni adjustment for multiple comparisons was applied. The results from the pairwise comparisons showed that the only significant difference at an alpha of 0.05 existed between the means related with the lowest and highest levels of physical activity, which are Underactive-light and Active levels, with a *p*-value of 0.012. The mean differences between Underactive-light and Underactive-regular, as well as between Underactive-regular and Active were non-significant.

Table 7.5

Pairwise Comparisons for Overweight Category

(I) Physical activity	(J) Physical_Activity_2	Mean difference (I-J)	Std. error	Sig.[a]
Underactive-light	Underactive-regular	-1.133	.611	.215
	Active	-1.638*	.535	.012
Underactive-regular	Underactive-light	1.133	.611	.215
	Active	-.504	.470	.870
Active	Underactive-light	1.638*	.535	.012
	Underactive-regular	.504	.470	.870

Note. Adjustment for multiple comparisons: Bonferroni. The mean difference is significant at the .05 level.

In order to check for possible outliers and test the assumption for normality of the experimental error, an analysis of residuals was performed. The results in Table 7.6 show that no standardized residual was beyond the (-3, +3) interval, so no outliers in this data set were present.

Table 7.6

Analysis of Residuals for Overweight Category

			Case number	Value
Standardized residual for body image	Highest	1	84	2.42
		2	57	1.77
		3	49	1.37
		4	114	1.37
		5	99	1.23
	Lowest	1	141	-2.13
		2	6	-1.61
		3	131	-1.45
		4	40	-1.45
		5	75	-1.18

The assumption for normality of the experimental error was tested using two formal statistical tests with results presented in Table 7.7. Both tests yielded non-significant results: Kolmogorov-Smirnov's D (40) = 0.100, p = 0.200, Shapiro-Wilk's W (40) = 0.989, p = 0.964. This shows that the assumption for normality was satisfied.

Table 7.7

Tests of Normality in Overweight Category

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	c	df	Sig.	Statistic	df	Sig.
Standardized residual for body image	.100	40	.200*	.989	40	.964

Note. Lilliefors Significance Correction. This is a lower bound of the true significance.

Normal Weight Category

A one-way ANOVA was performed for the Normal weight category using a general linear model. The descriptive statistics of body image and physical activity are displayed in Table 8.

Table 8

Descriptive Statistics of Normal Weight Category

Physical activity	Mean	Std. deviation	*n*
Underactive-light	5.1875	1.26126	8
Underactive-regular	5.2000	1.31890	10
Active	5.3843	1.73517	36
Total	5.3210	1.58175	54

The main results of the one way ANOVA analysis in the Normal weight category are shown in Table 8.1. The interaction between physical activity and body image was non-significant, $F(2,51) = .084$, $p = .92$, accounting for 0.3% of the variance in body image.

Table 8.1

Analysis of Variance Results for Normal Weight Category

Source	Type III sum of squares	df	Mean square	F	Sig.	Partial Eta squared
Corrected model	.433[a]	2	.217	.084	.920	.003
Intercept	984.060	1	984.060	379.716	.000	.882
Physical activity	.433	2	.217	.084	.920	.003
Error	132.170	51	2.592			
Total	1661.500	54				
Corrected Total	132.603	53				

Note. R Squared = .003 (Adjusted R Squared = -.036)

Table 8.2. provides information on the observed power of the relevant F-test for significance of physical activity. This shows that the observed power was 0.062, which was the reason why the effect size, Partial Eta Squared of 0.003, was found non-significant. In order to detect that the effect size is significant, a larger sample size than the current sample of 54 would be needed.

Table 8.2

Observed Power for Normal Weight Category

Source	Noncent. parameter	Observed power[b]
Corrected model	.167	.062
Intercept	379.716	1.000
Physical activity	.167	.062

Note. Computed using alpha = .05.

The estimates of body image within the Normal weight category are included in Table 8.3. This includes the mean, standard error, and 95% confidence interval for each physical activity category.

Table 8.3

Estimates for Normal Weight Category

Physical activity			95% Confidence interval	
	Mean	Std. error	Lower bound	Upper bound
Underactive-light	5.188	.569	4.045	6.330
Underactive-regular	5.200	.509	4.178	6.222
Active	5.384	.268	4.846	5.923

The assumption for the homogeneity of variances of body image among the physical activity categories were tested using the Levene's test. The results provided in Table 8.4 display the relevant *p* value of 0.28, which indicates that the assumption for the homogeneity of variances within the Normal weight category were satisfied.

Table 8.4

Test of Homogeneity of Variances for Normal Weight Category

Levene statistic	df1	df2	Sig.
1.305	2	51	.280

In order to check for possible outliers and test the assumption for normality of the experimental error within the Normal weight category, an analysis of residuals was performed. The results in Table 8.5 show that no standardized residual was beyond the (-3, +3) interval, so no outliers in this data set were present.

Table 8.5

Analysis of Residuals for Normal Weight Category

			Case number	Value
Standardized Residual for body image	Highest	1	123	1.52
		2	154	1.52
		3	15	1.44
		4	29	1.42
		5	32	1.42
	Lowest	1	145	-2.72
		2	9	-2.10
		3	146	-1.79
		4	41	-1.58
		5	81	-1.57

The assumption for normality of the experimental error within the Normal weight category was tested using two formal statistical tests with results presented in Table 8.6. Both tests yielded non-significant results: Kolmogorov-Smirnov's D (54) = 0.089, p =

0.200, Shapiro-Wilk's W (54) = 0.969, $p = 0.166$. This shows that the assumption for normality was satisfied.

Table 8.6

Tests of Normality in Normal Weight Category

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	c	df	Sig.	Statistic	df	Sig.
Standardized residual for body image	.089	54	.200*	.969	54	.166

Note. Lilliefors Significance Correction. This is a lower bound of the true significance.

Underweight Category

A one way ANOVA was performed on the Underweight category using a general linear model. The descriptive statistics of body image and physical activity are displayed in Table 9.

Table 9

Descriptive Statistics of Underweight Category

Physical activity	Mean	Std. deviation	*n*
Underactive-light	5.6389	1.18047	6
Underactive-regular	4.4792	1.07805	8
Active	5.1627	1.83003	25
Total	5.0957	1.62548	39

The main results of the one way ANOVA analysis in the Underweight category are shown in Table 9.1. The interaction between physical activity and body image was non-significant, $F(2,36) = .928$, $p = .405$, accounting for 4.9% of the variance in body image.

Table 9.1

Analysis of Variance Results for Underweight Category

Source	Type III sum of squares	df	Mean square	F	Sig.	Partial Eta squared
Corrected model	4.923[a]	2	2.462	.928	.405	.049
Intercept	704.022	1	704.022	265.448	.000	.881
Physical activity	4.923	2	2.462	.928	.405	.049
Error	95.479	36	2.652			
Total	1113.093	39				
Corrected total	100.403	38				

Note. R Squared = .049 (Adjusted R Squared = -.004)

Table 9.2. provides information on the observed power of the relevant F-test for significance of physical activity. This shows that the observed power was 0.198, which was the reason why the effect size, Partial Eta Squared of 0.049, was found non-significant. In order to detect that the effect size is significant, a larger sample size than the current sample of 39 would be needed.

Table 9.2

Observed Power for Underweight Category

Source	Noncent. parameter	Observed power[b]
Corrected model	1.856	.198
Intercept	265.448	1.000
Physical activity	1.856	.198

Note. Computed using alpha = .05.

The estimates of body image within the Underweight category are included in Table 9.3. This includes the mean, standard error, and 95% confidence interval for each physical activity category.

Table 9.3

Estimates for Underweight Category

Physical Activity			95% Confidence interval	
	Mean	Std. error	Lower bound	Upper bound
Underactive-light	5.639	.665	4.290	6.987
Underactive-regular	4.479	.576	3.311	5.647
Active	5.163	.326	4.502	5.823

The assumption for the homogeneity of variances of body image among the physical activity categories were tested using the Levene's test. The results provided in Table 9.4 display the relevant *p* value of 0.079, which indicates that the assumption for the homogeneity of variances within the Underweight category was satisfied.

Table 9.4

Test of Homogeneity of Variances for Underweight Category

Levene's statistic	df1	df2	Sig.
2.723	2	36	.079

In order to check for possible outliers and test the assumption for normality of the experimental error within the Underweight category, an analysis of residuals was performed. The results in Table 9.5 show that no standardized residual was beyond the (-3, +3) interval, so no outliers in this data set were present.

Table 9.5

Analysis of Residuals for Underweight Category

			Case number	Value
Standardized Residual for body image	Highest	1	56	1.95
		2	98	1.64
		3	8	1.54
		4	142	1.25
		5	59	1.23
	Lowest	1	161	-1.74
		2	130	-1.74
		3	60	-1.70
		4	103	-1.33
		5	35	-1.23

The assumption for normality of the experimental error within the Underweight category was tested using two formal statistical tests with results presented in Table 8.6. Both tests yielded non-significant results: Kolmogorov-Smirnov's D (39) = 0.97, p = 0.371,

Shapiro-Wilk's W (39) = 0.118, $p = 0.186$. This shows that the assumption for normality was satisfied.

Table 9.6

Tests of Normality in Underweight Category

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	c	df	Sig.	Statistic	df	Sig.
Standardized residual for body image	.118	39	.186	.970	39	.371

Note. Lilliefors Significance Correction. This is a lower bound of the true significance.

Summary

Data were collected from a total of 161 adult female students at a community college in Southwestern U.S. The research hypothesis stated there would be a significant difference in young adult women's body image, as measured by the BISS, within similar BMI categories between those who are more physically active and those who are less physically active, as measured by the RAPA. A one way ANOVA was run for each BMI category using each of the five physical activity categories (see Appendix G). Due to the minimal number of responses in the Sedentary, Underactive, and Underactive regular-light categories, these categories were combined to form one physical activity category, which was labeled Underactive-light. The other physical activity categories, Underactive-regular

and Active, remained intact. This created a new factor with three total physical activity categories, which was the physical activity variable analyzed here. The goal of this data restructuring was to make the relevant data sets more balanced, which could increase the power of the ANOVA *F* tests.

The results showed that physical activity was significantly related to body image among women within the Overweight category. Physical activity was not significantly related to body image among women within the Normal weight and Underweight categories. An additional exploratory test was run separating RAPA categories 6 and 7 to identify if there was a significant difference in means and standard deviations of body image within these activity levels. In the original study, these categories were combined and included within RAPA category 5. The results showed that body image means within RAPA categories 6 and 7 were close to the mean of RAPA category 5, and the standard deviations were almost equal. This confirmed that categories 5, 6, and 7 should remain grouped together. These details can be seen in Appendix H.

These results only partially support the hypothesis that a significant difference in body image would exist based on physical activity frequency. In order for the effect size within the Normal weight and Underweight categories to yield significant results, a larger sample size would be needed. This suggests that there is limited generalizability with this research, and generalizing beyond this particular sample should be done with caution. These results, interpretations, and implications for social change will be further discussed in Chapter 5.

Chapter 5: Summary, Conclusion, and Recommendations

Introduction

The purpose of this study was to explore the difference in body image within similar BMI categories, based on physical activity frequency, among 18- to 20-year-old community college females. If physical activity frequency significantly affects body image, the promotion of physical activity in schools, specifically physical education programs, could hold greater value. These programs could have an increase in promotion and funding and be more valuable to the overall health and well-being of our youth.

I used a survey design that consisted of several sections. The first section was a demographic questionnaire asking for age, sex confirmation, and ethnicity. In the following section, I asked for height and weight, which I later converted into a BMI score for analysis. In the subsequent section, I obtained physical activity frequency within participants using the five items within the RAPA. I used the last section to obtain body image states within participants using the six items within the BISS. The independent variable was body image, and the dependent variables were BMI and physical activity frequency. I grouped BMI into three categories, as determined by the CDC (2015): underweight, normal weight, and overweight. I grouped physical activity frequency into five categories, as determined by the RAPA (University of Washington Health Promotion Research Center, 2006): sedentary, underactive, underactive regular-light, underactive-regular, and active. In this chapter, I include a summary of the findings, interpretation of the findings, recommendations for further research, and implications for social change.

Summary of Findings

Of the 161 responses from college females between the ages of 18-20, 133 were analyzed and included in the results. The remaining 28 responses were omitted due to either an invalid or incomplete response, or due to an upper limit for BMI, which was set at 29. All respondents were grouped into one of three BMI categories: Underweight (n = 39), Normal weight (n = 54), or Overweight (n = 40). Within each BMI category, respondents were categorized into a physical activity category, based on their RAPA score: Sedentary, Underactive, Underactive regular-light, Underactive-regular, and Active. The majority of responses existed in the Underactive regular-light, Underactive regular, and Active, so the Sedentary and Underactive categories were combined with the Underactive regular-light to create a new variable that reflected a more balanced data set. This adjustment increased the power of the ANOVA F tests, as the original physical activity categories had no significant effect on body image.

A one way ANOVA was run for each of the three BMI categories to determine if physical activity frequency had a significant impact on body image. The results determined that physical activity had a significant impact on body image among women within the Overweight category, but did not have a significant impact among women within the Normal weight and Underweight categories. A post-hoc test with pairwise comparisons was run to determine which means were significant within the Overweight category. This test determined that only the means between the Underactive light and Active categories were significant (p of .012*)*. The homogeneity of variances among each physical activity category

within each BMI categories for each physical activity category were confirmed using Levene's test. No outliers were present in any of the three BMI categories within each physical activity category.

Interpretation of Findings

Physical activity has continuously been associated with improvements in body composition and body image (Grogan, 2007). A physical activity bout of at least 10 minutes has been shown to have a positive impact on several factors, such as mood, sleep, self-esteem, body composition, and body image. Increases in duration, frequency, and intensity (in moderation), can further enhance these effects (Grogan, 2007). The results of this study support that physical activity improves body image among college women categorized in the Overweight BMI category. The results did not show a significant relationship between physical activity frequency and body image among college women in the Normal weight and Underweight categories.

The women in the Overweight BMI category reported being most dissatisfied with their body image, while women in the Underweight and Normal weight categories were similarly less dissatisfied. Of the women in the Overweight category, 23 participants were within the Active category, which exceeded the combined total within the Underactive light and Underactive regular-light categories. Heinberg, Thompson, and Matson (2001) identified that some degree of body dissatisfaction can be motivating with regards to physical activity. Considering the women in the Overweight category reported the lowest

mean for body image, which can be translated into the greatest degree of body dissatisfaction, perhaps they are more motivated to be physically active as a result.

A meta-analysis by Hausenblas and Fallon (2006) reported a continuous trend of exercise improving body image. This would question the findings showing the majority of the women in the Overweight category reported that they were very active, yet had the lowest mean with regards to body image. This finding suggests that many other variables might contribute to overall body image, even though many studies support the positive effect physical activity has on body image and body dissatisfaction (Hausenblas & Fallon, 2006). The mean scores for body image within each physical activity category increased proportionately with the amount of activity. This supports the notion that physical activity has a positive effect on body image (Hausenblas & Fallon, 2006).

Theoretical Application

The HBM suggests that there are several factors that go into the participation of health related behaviors (Rosenstock et al., 1988). Perceived severity suggests that one assesses the severity of a problem and the consequences present in order to determine participation in behavior change. Perceived susceptibility refers to an analysis of the potential risks for developing a health issue, and in turn determines participation in behavior change. The blend of perceived severity and perceived susceptibility is referred to as perceived threat, and according to the HBM, the greater the perceived threat, the greater the chance of participation in health-promoting behaviors (Rosenstock et al., 1988). Applying this to the results of this study, the women in the Overweight category could view their body

composition as a severe problem, and in turn participate in physical activity to reduce the consequences present. This interpretation could explain the majority of women within the Active category. Similarly, the overweight population could feel more susceptible to the potential risks of being overweight, and this could be a driving factor for participation in physical activity.

Perceived benefits and perceived barriers are also components of the HBM (Rosenstock et al., 1988). If the perceived benefits outweigh the perceived barriers, the chances of positive health behavior change increase, and vice versa. If the women in Overweight category within this study perceived the benefits of physical activity to outweigh the challenges of maintaining regular physical activity, this could help explain the majority being in the Active category.

Higgin's self-discrepancy theory (1999) outlines three domains of body image. These include the actual, ideal, and ought. The actual refers to what one really is; one's true body composition. The ideal refers to what one would like to be. Lastly, the ought refers to what one feels others believe they should be. When there is a discrepancy present among any of the domains, body dissatisfaction is present. The greater the discrepancy, the greater the body dissatisfaction (Higgins, 1999). Participants in this study were asked to complete the BISS portion of the survey, which was assumed to include their actual feelings of body image. Participants were placed into the BMI categories based on reported height and weight, so they might not have identified with the BMI category they were assigned to. In other words, their BMI assignment was based on body composition, which is not always

proportionate to body image. Participants might have been placed in the Underweight category, when they could actually identify themselves as overweight. This is often considered body image distortion, which if present, could alter the proportional relationship of body image and BMI within this study.

Limitations of the Study

This study employed a survey design with self-reporting questionnaires, which inherently is subject to limitations that may alter the reliability of the data collected. Several of the participants did not complete the entire survey, and some submitted responses outside the scope of this study, which were excluded from analysis. It is possible that some participants did not respond accurately and honestly, which would impact the results. It was also assumed the RAPA and BISS accurately assessed physical activity frequency and body image, respectively. Additionally, this study only considered physical activity and BMI as its variables of interest, while many other factors could potentially influence body image.

The majority of participants in the study were White, and all were female. The results may not accurately portray the relationship between body image and physical activity beyond this particular sample. The small sample size is another limitation. Considering two of the three categories did not have a significant outcome, a larger sample size would be necessary to generalize the results of this study. The physical activity categories were altered to combine the lower three categories due to a small number of responses. A larger number of responses in all of the original physical activity categories might have led to different results.

Recommendations for Future Research

The findings within this study indicate further research would be needed to better understand the impact of physical activity frequency on body image. Further research, including a larger sample size, and a more diverse ethnic and geographic participant pool could help to strengthen the power of the hypothesis explored. It was determined that physical activity frequency had a significant impact on the women within the Overweight category, but a larger sample is needed to identify if physical activity frequency has a significant impact on the women within the Normal weight and Underweight categories.

One recommendation for future research would be to include females between the ages of 15-20. This study explored only young community college adults between the ages of 18-20; however, the inclusion of females 15-17 years of age could have strengthened the results. Fisher (2014) discussed the prevalence of body dissatisfaction within 15- to 20-year-old females due to a variety of factors. Including a wider age range may capture the impact of physical activity on body image within this vulnerable population.

An additional recommendation would be to include other covariates to determine the strength of multiple variables on body image. Isolating physical activity frequency made it difficult to determine the existence and power of other influences on body image, such as socioeconomic status, parental input, family history, geographic location, the media, and dietary exposure (Hausesnblas & Fallon, 2006). Including multiple variables could help to better understand the power of physical activity frequency on body image.

Implications for Social Change

The potential implications for positive social change include a better understanding of how physical activity can influence body image. The results of this study, and many other studies, indicate a positive relationship between physical activity and improved body image (Hausenblas & Fallon, 2006). Adolescent and young adult females are highly susceptible to a variety of negative health behaviors as a result of body image issues and body dissatisfaction (Smolak, 2004). Some factors include eating disorders, depression, anxiety, and even suicide (Smolak, 2004). Identifying factors that can contribute to improving body image and reducing body dissatisfaction can help to mitigate the chances of developing such health behaviors (Kay & Shipman, 2014).

Approximately half of all females express some degree of body dissatisfaction as they enter adolescents and young adulthood (Kay & Shipman, 2014). Knowing this population is at an increased risk for related health behaviors, promoting ways of improving body image should be at the forefront of schools and communities. The purpose of this study was to identify how physical activity plays a role, and this study as well as others, has confirmed a positive relationship between physical activity and body image.

According to Lee, Burgeson, Fulton, and Spain (2015), only 3.6 percent of elementary schools, 7.8 percent of middle schools, and 2.2 percent of high schools offer students daily physical activity. School-based physical education programs are directly related to preventing obesity in children and adolescents, as well as improving self-esteem, academic performance, and body image (Trost, 2009). Knowing this, school programs

should not be cutting physical education programs as they have been in recent years, but increasing their presence instead (Trost, 2009).

Lawson (2005) suggested that sport, exercise, and physical education (SEPE) specialists empower youth on a number of life domains. SEPE specialists enhance human health and well-being, and should be at the forefront of efforts by the community, government, and social work specialists. SEPE professionals should continue to advance new capacities and construct new institutions to help make their efforts as pervasive as possible (Lawson, 2005). Sharing results such as the findings from this study can help support SEPE specialists and their efforts to maintain and expand physical activity involvement in communities and schools. Promoting physical activity and all the benefits it provides is the motivation behind this study.

Conclusion

As research has shown, young adult females are highly susceptible to negative health behaviors due to poor body image and body dissatisfaction (Kay & Shipman, 2014). It has also been concluded that physical activity can have a positive impact on a variety of areas of health, including self-esteem and body image (Fisher, 2014). Therefore, physical activity can reduce the chances of eating disorders, depression, anxiety, and suicide that can emerge from body dissatisfaction (Smolak, 2006).

This present study was conducted to identify the impact of physical activity frequency on body image, and in turn, support the promotion of physical activity in schools and other youth programs. This study focused on 161 community college females between the ages of

18-20 years old . Participants were categorized into one of three BMI categories (Overweight, Normal weight, or Underweight), based on self-reported height and weight. Physical activity frequency and body image were reported using two previously developed instruments, the RAPA and BISS. A one way ANOVA was run for each BMI category to determine the impact of physical activity frequency on body image.

The findings of this study determined that physical activity had a significant impact on body image among women in the Overweight category. There was no significant impact of physical activity among women within the Normal weight and Underweight categories. In all BMI categories, physical activity frequency and body image had a positive relationship. Although the results of this study did not yield significant findings within all BMI categories, the association between physical activity frequency and body image was consistent with other research. Body image issues and body dissatisfaction are increasingly prevalent in young adult females, so these findings support the positive impact physical activity has on body image within this population. Body image issues and body dissatisfaction can lead to a variety of negative health behaviors, so these findings should help support the promotion of increasing physical activity programs in schools and communities. These programs could help to improve body image, and in turn, decrease the chances of related negative health behaviors.

References

Baumgartner, R. N. (2000). Body composition in healthy aging. *Annals of the New York Academy of Sciences*, *904*(1), 437-448. doi:10.1111/j.1749-6632.2000.tb06498.x

Boyd, D. (2014). *It's complicated: The social lives of networked teens*. New Haven, CT: Yale University Press. Retrieved from http://dl.acm.org/citation.cfm?id=2584525

Bucchianeri, M. M., Arikian, A. J., Hannan, P. J., Eisenberg, M. E., & Neumark-Sztainer, D. (2013). Body dissatisfaction from adolescence to young adulthood: Findings from a 10-year longitudinal study. *Body image*. *10*(1), 1-7. doi:10.1016/j.bodyim.2012.09.001

Buckworth, J. (2013). *Exercise Psychology*. Human kinetics. Retrieved from: http://googlescholar.com

Campbell, A., & Hausenblas, H. A. (2009). Effects of exercise interventions on body image: A meta-analysis. *Journal of Health Psychology*, *14*(6), 780-793. doi:10.1177/1359105309338977

Carlock, C. J. (2013). *Enhancing self-esteem*. Abingdon, United Kingdom: Taylor & Francis.

Centers for Disease Control (2015). BMI categories. Retrieved from: http://www.cdc.gov/growthcharts/html_charts/bmiagerev.htm#females

Colman, G. J., & Dave, D. M. (2013). *Physical Activity and Health* (No. w18858). National Bureau of Economic Research. doi:10.3386/w18858

Erickson, S. J., Robinson, T. N., Haydel, K. F., & Killen, J. D. (2000). Are overweight children unhappy? Body mass index, depressive symptoms, and overweight concerns in elementary school children. *Archives of Pediatrics & Adolescent Medicine*, *154*(9), 931-935. doi:10.1001/archpedi.154.9.931

Fallon, E. A., Harris, B. S., & Johnson, P. (2014). Prevalence of body dissatisfaction among a United States adult sample. *Eating Behaviors*, *15*(1), 151-158. doi:10.1016/j.eatbeh.2013.11.007

Fallon, A. E., & Rozin, P. (1985). Sex differences in perceptions of desirable body shape. *Journal of Abnormal Psychology*, *94*(1), 102-142. http://dx.doi.org/10.1037/0021-843X.94.1.102

Ferguson, C. J. (2013). In the eye of the beholder: Thin-ideal media affects some, but not most, viewers in a meta-analytic review of body dissatisfaction in women and men. *Psychology of Popular Media Culture*, *2*(1), 20. http://dx.doi.org/10.1037/a0030766

Festinger, L. (1954). A theory of social comparison processes. *Human Relations, 7*(2), 117-140. Retrieved from http://www2.psych.ubc.ca/~schaller/528Readings/Festinger1954.pdf

Fisher, S. (2014). *Development and Structure of the Body Image* (Vol. 2). Abingdon, United Kingdom: Psychology Press.

Fiske, L., Fallon, E. A., Blissmer, B., & Redding, C. A. (2014). Prevalence of body dissatisfaction among United States adults: Review and recommendations for future research. *Eating Behaviors*, *15*(3), 357-365. doi:10.1016/j.eatbeh.2014.04.010

Gaudio, S., & Quattrocchi, C. C. (2012). Neural basis of a multidimensional model of body image distortion in anorexia nervosa. *Neuroscience & Biobehavioral Reviews, 36*(8), 1839-1847. doi:10.1016/j.neubiorev.2012.05.003

Golden, N. H., Katzman, D. K., Kreipe, R. E., Stevens, S. L., Sawyer, S. M., Rees, J., . . . & Rome, E. S. (2003). Eating disorders in adolescents. *Journal of Adolescent Health*, *33*(6), 496-503. Retrieved from http://www.jahonline.org/article/

Grabe, S., & Hyde, J. S. (2006). Ethnicity and body dissatisfaction among women in the United States: a meta-analysis. *Psychological Bulletin*, *132*(4), 622. http://dx.doi.org/10.1037/0033-2909.132.4.622

Green, E. C., & Murphy, E. (2014). Health belief model. *The Wiley Blackwell encyclopedia of health, illness, behavior, and society*. doi:10.1002/9781118410868.wbehibs410

Grogan, S. (2007). *Body Image: Understanding body dissatisfaction in men, women and children*. Abingdon, United Kingdom: Routledge.

Heinberg, L. J., Thompson, J. K., & Matzon, J. L. (2001). Body image dissatisfaction as a motivator for healthy lifestyle change: Is some distress beneficial?

Heiman, G. W. (2001). *Understanding research methods and statistics: An integrated introduction for psychology* (No. 04; BF76. 5, H4 2001.). Retrieved from http://www.sidalc.net/cgibin/wxis.exe/?IsisScript=COLPOS.xis&method=post&formato=2&cantidad=1&expresion=mfn=033898

Heron, K. E., & Smyth, J. M. (2013). Body image discrepancy and negative affect in women's everyday lives: An ecological momentary assessment evaluation of self-discrepancy theory. *Journal of Social and Clinical Psychology*, *32*(3), 276. Retrieved from http://search.proquest.com/openview/14882bc6556595278d4c808478a7e77e/1?pq-origsite=gscholar

Higgins, E. T. (1999). Who do self-discrepancies have specific relations to emotions? The second-generation question of Tangney, Niedenthal, Covert, and Barlow (1998). *Journal of Personality and Social Psychology*, 77(6), 1313-1317. http://dx.doi.org/10.1037/0022-3514.77.6.1313

Hausenblas, H. A., & Fallon, E. A. (2006). Exercise and body image: A meta-analysis. *Psychology and Health*, *21*(1), 33-47.

Hubbs, A., Doyle, E. I., Bowden, R. G., & Doyle, R. D. (2012). Relationships among self-esteem, stress and physical activity in college students. 1. *Psychological Reports*, *110*(2), 469-474. Retrieved from http://web.a.ebscohost.com/abstract

Kay, K., & Shipman, C. (2014). The confidence gap. *The Atlantic*, *14*, 1-18. Retrieved from http://theavarnagroup.com/wp-content/uploads/2015/11/The-Confidence-Gap-The-Atlantic.pdf

Lawson, H. A. (2005). Empowering people, facilitating community development, and contributing to sustainable development: The social work of sport, exercise, and physical education programs. *Sport, Education and Society*, *10*(1), 135-160.

Lin, L. F., & Kulik, J. A. (2002). Social comparison and women's body satisfaction. *Basic & Applied Social Psychology, 24*(2), 115-123Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology*, *35*(2), 63. doi:10.1207/S15324834BASP2402_4

Morrison, M. A., Morrison, T. G., & Sager, C. L. (2004). Does body satisfaction differ between gay men and lesbian women and heterosexual men and women?: A meta-analytic review. *Body Image*, *1*(2), 127-138. doi:10.1016/j.bodyim.2004.01.002

National Eating Disorder Association. Retrieved from https://www.nationaleatingdisorders.org/media-body-image-and-eating-disorders

Neumark-Sztainer, D., Paxton, S. J., Hannan, P. J., Haines, J., & Story, M. (2006). Does body satisfaction matter? Five-year longitudinal associations between body satisfaction and health behaviors in adolescent females and males. *Journal of Adolescent Health*, *39*(2), 244-251. doi:10.1016/j.jadohealth.2005.12.001

Reynolds, W. M. (2010). *Reynolds adolescent depression scale*. John Wiley & Sons, Inc. doi: 10.1002/9780470479216.corpsy0798

Rodgers, R. F., McLean, S. A., & Paxton, S. J. (2015). Longitudinal relationships among internalization of the media ideal, peer social comparison, and body dissatisfaction: Implications for the tripartite influence model. *Developmental Psychology*, *51*(5), 706. http://dx.doi.org/10.1037/dev0000013

Rosen, J. C. (2013). Body image disorder: Definition, development, and contribution to eating disorders. *The Etiology of Bulimia: The Individual and Familial Context*, 157-177. Retrieved from https://books.google.com/books

Rosenstock, I. M., Strecher, V. J., Becker, M. H. (1988). Social learning theory and the health belief model. *Health Education Quarterly*, 15(2). Retrieved from: http://deepblue.lib.umich.edu/bitstream/handle/2027.42/67783/10.1177_109019?sequence=2

Runfola, C. D., Von Holle, A., Trace, S. E., Brownley, K. A., Hofmeier, S. M., Gagne, D. A., & Bulik, C. M. (2013). Body dissatisfaction in women across the lifespan: Results of the UNC-SELF and gender and body image (GABI) studies. *European Eating Disorders Review*, *21*(1), 52-59. doi: 10.1002/erv.2201

Sallis, J. F., Prochaska, J. J., & Taylor, W. C. (2000). A review of correlates of physical activity of children and adolescents. *Medicine and Science in Sports and Exercise*, *32*(5), 963-975. doi: 0195-9131/00/3205-0963/0

Sands, E. R., & Wardle, J. (2003). Internalization of ideal body shapes in 9--12-year-old girls. *International Journal of Eating Disorders*, *33*(2), 193-204. doi: 10.1002/eat.10121

Slade, P. D. (2004). What is body image?. *Behaviour research and therapy*,*32*(5), 497-502. doi:10.1016/0005-7967(94)90136-8

Schilder, P. (2013). *The Image and Appearance of the Human Body* (Vol. 163). Routledge. Retrieved from https://books.google.com/books

Schneider, S., Weiß, M., Thiel, A., Werner, A., Mayer, J., Hoffmann, & GOAL Study Group. (2013). Body dissatisfaction in female adolescents: extent and correlates. *European Journal of Pediatrics*, *172*(3), 373-384. 10.1007/s00431-012-1897-z

Smolak, L. (2004). Body image in children and adolescents: Where do we go from here? *Body Image, 1*(1), 15-28. doi:10.1016/S1740-1445(03)00008-1

Tiggermann, M., & Lynch, J.E. (2001). Body image across the life span in adult women: The role of self-objectification. *Developmental Psychology, 37(2),* 243-253. http://dx.doi.org/10.1037/0012-1649.37.2.243

Tiggermann, M., & Mcgill, B. (2004). The role of social comparison in the effect of magazine advertisements on women's mood and body dissatisfaction. *Journal of Social and Clinical Psychology, 23(1),* 23-44. Retrieved from http://search.proquest.com/openview/6c2d3c38b3becd3ae3e1407bbb9fa552/1?pq-origsite=gscholar

Tiggemann, M., & Slater, A. (2004). Thin ideals in music television: A source of social comparison and body dissatisfaction. *International Journal of Eating Disorders, 35(1),* 48-58. doi: 10.1002/eat.10214

Trost, S. G., & van der Mars, H. (2009). Why we should not cut PE. *Educational Leadership*, *67*(4), 60-65.

University of Washington Health Promotion Research Center (UWHPRC) (2006). Rapid Assessment of Physical Activity.

Watson, N., Bryan, B. C., & Thrash, T. M. (2014). Change in self-discrepancy, anxiety, and depression in individual therapy. *Psychotherapy*, *51*(4), 525. http://dx.doi.org/10.1037/a0035242

Williams, G. A., Hudson, D. L., Whisenhunt, B. L., & Crowther, J. H. (2014). An examination of body tracing among women with high body dissatisfaction. *Body Image, 11*(4), 346-349. doi:10.1016/j.bodyim.2014.05.005

Wills, T. (2015). Factors relating to motivation to change behavior in individuals who are overweight: application of the health belief model. Retrieved from https://cora.ucc.ie/handle/10468/2052

Wright, K. B. (2005). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-Mediated Communication, 10*(3), 00-00. doi: 10.1111/j.1083-6101.2005.tb00259.x

Appendix A: Body Image Survey

Body Image Survey

Consent

You are invited to take part in a research study about physical activity and body image. The researcher is inviting 18-20 year old college females to be in the study. I obtained your name/contact information via Crafton Hills College. This form is part of a process called "informed consent" to allow you to understand this study before deciding whether to take part.

This study is being conducted by a researcher named Kristin Minter, who is a doctoral student at Walden University. You might already know the researcher as an Instructor at Crafton Hills College, but this study is separate from that role.

Background Information:

The purpose of this study is to assess the influence of physical activity on body image within young adult females.

Procedures:

If you agree to be in this study, you will be asked to:

- Complete an online survey. Your participation is expected to take about 10 minutes.
-

Here are some sample questions:

- I do some light physical activity every week.
  Yes
  No
- I rarely or never do any physical activities.
  Yes

  No

Voluntary Nature of the Study:

This study is voluntary. You are free to accept or turn down the invitation. No one at Crafton Hills College will treat you differently if you decide not to be in the study. If you decide to be in the study now, you can still change your mind later. You may stop at any time.

Risks and Benefits of Being in the Study:

Being in this type of study involves some risk of the minor discomforts that can be encountered in daily life, such as becoming upset or uncomfortable with the questions relating to body image. Being in this study would not pose risk to your safety or wellbeing.

If you feel stressed or anxious about your feelings of body image, please note this free help line from the National Eating Disorders Association: 1-800-931-2237.

This study could improve understanding about the impact of physical activity on body image, which could promote physical activity.

Payment:

There will be no payments related to participation.

Privacy:

Reports coming out of this study will not share the identities of individual participants. Details that might identify participants, such as the location of the study, also will not be shared. Even the researcher will not know who you are. The researcher will not use your personal information for any purpose outside of this research project. Data will be kept secure by encryption software within SurveyMonkey, the survey provider being used to host this study. All data will be password protected. Data will be kept for a period of at least 5 years, as required by the university.

Contacts and Questions:

You may ask any questions you have now. Or if you have questions later, you may contact the researcher via Kristin.minter@waldenu.edu. If you want to talk privately about your rights as a participant, you can call the Research Participant Advocate at my university at 612-312-1210. Walden University's approval number for this study is **IRB will enter approval number here** and it expires on **IRB will enter expiration date.** Please print or save this consent form for your records.

Please print or save this consent form for your records.

Obtaining Your Consent:

If you feel you understand the study well enough to make a decision about it, please indicate your consent by clicking "Agree" below to proceed to the survey:

Individual Information

Please provide your response to the items below.

* 1. I am a female

- ☐ Yes
- ○ No

* 2. Please indicate your age:

- ☐ 18
- ☐ 19
- ☐ 20

3. Please indicate your race:

- ☐ White
- ☐ Black or African American
- ☐ American Indian and Alaskan Native
- ☐ Asian
- ○ Native Hawaiian and Other Pacific Islander
- ☐ Other

* 4. Height in inches

* 5. Weight in pounds

For each of the items below, choose the one statement that best describes how you feel RIGHT NOW, AT THIS VERY MOMENT. Read the items carefully to be sure the statement you choose accurately and honestly describes how you feel right now.

* 6. Right now I feel...

- ◯ Extremely dissatisfied with my physical appearance
- ◯ Mostly dissatisfied with my physical appearance
- ◯ Moderately dissatisfied with my physical appearance
- ◯ Slightly dissatisfied with my physical appearance
- ◯ Neither dissatisfied nor satisfied with my physical appearance
- ◯ Slightly satisfied with my physical appearance
- ◯ Moderately satisfied with my physical appearance
- ◯ Mostly satisfied with my physical appearance
- ◯ Extremely satisfied with my physical appearance

* 7. Right now I feel...

- ◯ Extremely satisfied with my body size and shape
- ◯ Mostly satisfied with my body size and shape
- ◯ Moderately satisfied with my body size and shape
- ◯ Slightly satisfied with my body size and shape
- ◯ Neither dissatisfied nor satisfied with my body size and shape
- ◯ Slightly dissatisfied with my body size and shape
- ◯ Moderately dissatisfied with my body size and shape
- ◯ Mostly dissatisfied with my body size and shape
- ◯ Extremely dissatisfied with my body size and shape

* 8. Right now I feel...

- ◯ Extremely dissatisfied with my weight
- ◯ Mostly dissatisfied with my weight
- ◯ Moderately dissatisfied with my weight

- ◯ Slightly dissatisfied with my weight
- ◯ Neither dissatisfied nor satisfied with my weight
- ◯ Slightly satisfied with my weight
- ◯ Moderately satisfied with my weight
- ◯ Mostly satisfied with my weight
- ◯ Extremely satisfied with my weight

* 9. Right now I feel...

- ◯ Extremely physically attractive
- ◯ Very physically attractive
- ◯ Moderately physically attractive
- ◯ Slightly physically attractive
- ◯ Neither attractive nor unattractive
- ◯ Slightly physically unattractive
- ◯ Moderately physically unattractive
- ◯ Very physically unattractive
- ◯ Extremely physically unattractive

* 10. Right now I feel...

- ◯ A great deal worse about my looks than I usually feel
- ◯ Much worse about my looks than I usually feel
- ◯ Somewhat worse about my looks than I usually feel
- ◯ Just slightly worse about my looks than I usually feel
- ◯ About the same about my looks as usual
- ◯ Just slightly better about my looks than I usually feel
- ◯ Somewhat better about my looks than I usually feel
- ◯ Much better about my looks than I usually feel
- ◯ A great deal better about my looks than I usually feel

* 11. Right now I feel that I look...

- ○ A great deal better than the average person looks
- ○ Much better than the average person looks
- ○ Somewhat better than the average person looks
- ○ Just slightly better than the average person looks
- ○ About the same as the average person looks
- ○ Just slightly worse than the average person looks
- ○ Somewhat worse than the average person looks
- ○ Much worse than the average person looks
- ○ A great deal worse than the average person looks

Physical Activity Assessment

Physical Activities are activities where you move and increase your heart rate above its resting rate, whether you do them for pleasure, work, or transportation. The following questions ask about the amount and intensity of physical activity you usually do. The intensity of the activity is related to the amount of energy you use to do these activities.

Examples of physical activity intensity levels:

Light activities • your heart beats slightly faster than normal • you can talk and sing	 Walking Leisurely  Stretching  Vacuuming or Light Yard Work
Moderate activities • your heart beats faster than normal • you can talk but not sing	 Fast Walking  Aerobics Class  Strength Training  Swimming Gently
Vigorous activities • your heart rate increases a lot • you can't talk or your talking is broken up by large breaths	 Stair Machine  Jogging or Running  Tennis, Racquetball, Pickleball or Badminton

* 12. I rarely or never do any physical activities.

* ◯ Yes
* ◯ No

* 13. I do some light or moderate physical activities, but not every week.
  * ◯ Yes
  * ◯ No

* 14. I do some light physical activity every week.
  * ◯ Yes
  * ◯ No

* 15. I do moderate physical activities every week, but less than 30 minutes a day or 5 days a week.
  * ◯ Yes
  * ◯ No

* 16. I do vigorous physical activities every week, but less than 20 minutes a day or 3 days a week.
  * ◯ Yes
  * ◯ No

* 17. I do 30 minutes or more a day of moderate physical activities, 5 or more days a week.
  * ◯ Yes
  * ◯ No

* 18. I do 20 minutes or more a day of vigorous physical activities, 3 or more days a week.
  * ◯ Yes
  * ◯ No

Appendix B: Body Mass Index Categories

Females, 2-20 years

Age (in months)	3rd Percentile BMI Value	5th Percentile BMI Value	10th Percentile BMI Value	25th Percentile BMI Value	50th Percentile BMI Value	75th Percentile BMI Value	85th Percentile BMI Value	90th Percentile BMI Value	95th Percentile BMI Value	97th Percentile BMI Value
216.5	17.1726	17.55015	18.18937	19.45491	21.27532	23.81564	25.67786	27.25433	30.32554	33.07324
228.5	17.38385	17.76515	18.41159	19.695	21.55082	24.16378	26.09993	27.75502	31.0288	34.023
240	17.43031	17.82009	18.48196	19.80018	21.717	24.4401	26.47872	28.23727	31.76474	35.05675

Category 1: 17-20 (<10th % - 25th %) = Underweight

Category: 21-23 (50th %) = Normal Weight

Category 3: 24-29 (85th % ->90$^{th\ \%}$) = Overweight

Note* Categories determined by the Centers for Disease Control (2015).

Appendix C: Permission to Use the Body Image States Scale

Dear Kristin,

I thank you for your order of the body-image assessment(s) indicated below on your invoice. These materials are attached as one or more viewable/printable "pdf" (Adobe Acrobat) files. If needed, download Adobe Acrobat Reader free fromhttp://www.adobe.com/products/acrobat/readstep.html. Your purchase of this individual user's license grants you permission to use the materials in your research for a period of 2 years with a total of no more than 1000 administrations (e.g., 1000 participants completing the assessment on one occasion; 500 participants completing the assessment on two occasions; etc.). Materials may not be provided to other researchers for their use. Commercial use (for ultimate profit) is prohibited, as it requires a commercial license. You may be interested in the new (2nd) edition of Cash and Smolak's (2011) "Body Image: A Handbook of Science, Practice, and Prevention." The publisher's link to this informative volume is http://www.guilford.com/cgibin/cartscript.cgi?page=pr/cash2.htm&sec=toc&dir=pp/ed&cart_id=792303.9996.

In July 2008, I published the second edition of "The Body Image Workbook," which presents my empirically validated cognitive-behavioral treatment program for body-image problems. For more information, visit http://www.newharbinger.com/productdetails.cfm?PC=583.

Finally, for your consideration, I'd like to make you aware of the peer-reviewed scientific journal "Body Image: An International Journal of Research." For more information, see the journal's website at http://www.elsevier.com/locate/bodyimage.

My best wishes in your body-image research.
Sincerely,
Thomas F. Cash, Ph.D.
www.body-images.com
Body-Images Research Consulting
Naples, Florida
email: body-images@comcast.net

Appendix D: Permission to Use the Rapid Assessment of Physical Activity

Thank you for your interest in the Rapid Assessment of Physical Activity (RAPA), a product of the University of Washington Health Promotion Research Center.
Use of the RAPA is free, with the provision that it is not sold or modified without permission.
To help us track its dissemination, please answer the following questions. When you submit your responses, you will see a link to the RAPA.

If you would like to share the RAPA with other organizations, please refer them to the following

URL: https://catalysttools.washington.edu/webq/survey/hprc/55463

Appendix E: Analysis of Variance Results for Original Physical Activity Categories

Descriptive Statistics of Overweight Category

Physical activity	Mean	Std. deviation	N
Sedentary	2.6667	.	1
Underactive	3.0000	.94281	2
Underactive regular-light	3.0833	2.20479	4
Underactive regular	4.1333	1.02379	10
Active	4.6377	1.20358	23
Total	4.2250	1.35324	40

Analysis of Variance Results for Overweight Category

	Type III sum of squares	df	Mean square	F	Sig.	Partial Eta squared
Corrected Model	14.644[a]	4	3.661	2.257	.083	.205
Intercept	162.128	1	162.128	99.947	.000	.741
Physical activity	14.644	4	3.661	2.257	.083	.205
Error	56.775	35	1.622			
Total	785.444	40				
Corrected Total	71.419	39				

Observed Power for Overweight Category

	Noncent. parameter	Observed power[b]
Corrected model	9.028	.598
Intercept	99.947	1.000
Physical Activity	9.028	.598

Note. Computed using alpha = .05.

Descriptive Statistics of Normal Weight Category

Physical activity	Mean	Std. deviation	N
Sedentary	5.0278	1.45073	6
Underactive	5.6667	.00000	2
Underactive regular-light	5.2000	1.31890	10
Underactive regular	5.3843	1.73517	36
Active	5.3210	1.58175	54
Total	5.0278	1.45073	6

Analysis of Variance Results for Normal Weight Category

	Type III sum of Squares	df	Mean square	F	Sig.	Partial Eta squared
Corrected model	1.045[a]	3	.348	.132	.940	.008
Intercept	569.937	1	569.937	216.611	.000	.812
Physical activity	1.045	3	.348	.132	.940	.008
Error	131.558	50	2.631			
Total	1661.500	54				
Corrected total	132.603	53				

Observed Power for Normal Weight Category

	Noncent. parameter	Observed power[b]
Corrected model	.397	.073
Intercept	216.611	1.000
Physical activity	.397	.073

Note. Computed using alpha = .05.

Descriptive Statistics of Underweight Category

Physical activity	Mean	Std. deviation	N
Sedentary	5.0000	.	1
Underactive	5.9583	1.38360	4
Underactive regular-light	5.0000	.	1
Underactive regular	4.4792	1.07805	8
Active	5.1627	1.83003	25
Total	5.0957	1.62548	39

Analysis of Variance Results for Underweight Category

	Type III sum of squares	df	Mean square	F	Sig.	Partial Eta squared
Corrected model	6.148[a]	4	1.537	.554	.697	.061
Intercept	271.374	1	271.374	97.891	.000	.742
Physical activity	6.148	4	1.537	.554	.697	.061
Error	94.255	34	2.772			
Total	1113.093	39				
Corrected total	100.403	38				

Observed Power for Underweight Category

	Noncent. parameter	Observed power[b]
Corrected model	2.218	.167
Intercept	97.891	1.000
Physical activity	2.218	.167

Note. Computed using alpha = .05.

The above results were used as a substantiation for the idea to adjust the data sets to increase the F-test *Power* by combining 3 of the categories of the factor Physical Activity into one new category of physical activity.

Appendix F: Exploratory Analysis for Rapid Assessment of Physical Activity Categories 5, 6, and 7

Rapid Assessment of Physical Activity Category 5

Descriptive Statistics

	N	Mean	Std. deviation
Body image	44	5.2614	1.72360
Valid N (listwise)	44		

Rapid Assessment of Physical Activity Category 6

Descriptive Statistics

	N	Mean	Std. deviation
Body image	53	4.9277	1.77666
Valid N (listwise)	53		

Rapid Assessment of Physical Activity Category 7

Descriptive Statistics

	N	Mean	Std. deviation
Body image	49	4.9878	1.72989
Valid N (listwise)	49		

The above results show that body image *means* for RAPA 6 and RAPA 7 categories are similar to the *mean* of RAPA 5 category. In addition the relevant *standard deviations* are almost equal, so the 3 categories can be combined in one.