The Effect of a Weight Management Clinic on Body Perception

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ABSTRACT

THE EFFECT OF A WEIGHT MANAGEMENT CLINIC ON BODY PERCEPTION

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While body image disturbances continue to be seen in individuals living in Western society, research has shown that both weight loss and exercise participation can decrease body image disturbance in both men and women. The purpose of the study was to examine the effect of a weight management clinic on body perception of obese individuals. Thirty nine participants were a part of a three-month weight management program with caloric restrictive diets and weekly exercise recommendations. The 34-item Multidimensional Body Self Relation Questionnaire, Body Assessment Scale and Social Physique Anxiety Questionnaire were administered at baseline and 12 weeks. All physiological measurements were conducted at baseline and 12 weeks. Based on participant's weight loss, they were divided into two groups: weight loss and no weight loss. A 2 (baseline, 12 week) X 2 (weight loss achieved, weight loss not achieved) repeated measures ANOVA was conducted with difference between ideal and current body position as the dependent variable to examine the relationship between weight loss and body perception. A 2 (baseline, 12 week) X 2 (weight loss achieved, weight loss not achieved) repeated measures ANOVA with social physique anxiety as the dependent variable was conducted to examine the relationship between weight loss goal achieved and body perception. A 2 (baseline, 12 week) X 2 (weight loss achieved, weight loss not achieved) repeated measures ANOVA with the MBRSQ-AS subscales as the dependent variable was conducted to examine the relationship between weight loss goal achieved and body perception. A Pearson correlation was run to predict weight loss from the MBSRQ-AS subscales, SPA and

BAS. The results of this study indicate that there was a significant difference in body perception from baseline to 12 weeks, regardless of weight loss achieved by participants. Additionally, there was no correlation between weight loss and body perception variables.

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CHAPTER I

INTRODUCTION

According to the United States Department of Health and Human Services (2014), the 2009-2010 National Health and Nutrition Examination survey showed that 68.8% of adults are considered to be overweight or obese. To further break this statistic down, the Centers for Disease Control and Prevention (2014) found that 34.9% of U.S. adults are obese. An individual is classified as overweight when their Body Mass Index (BMI) is greater than 24.9 kg/m^2 and obese when their BMI is greater than 30 kg/m^2. The physical health consequences of obesity include heart disease, type 2 diabetes, high blood pressure, high cholesterol and osteoarthritis (NIH, 2014). Where the physical health consequences of obesity are well understood and researched, the psychological components of obesity are much less clear.

Some psychological issues that have shown a relationship with body weight in past research include depression, general psychiatric symptoms, self-esteem, and body image disturbances (Friedman, 2005). Although body image is a complex concept that includes perceptual, affective, cognitive and behavioral aspects (Cash & Pruzinsky, 1990), contemporary Western society places the emphasis on body appearance, particularly weight and body shape (Tiggermann & McGill, 2004). In the past, body image disturbances were only thought to be of concern in young children who may be prone to obesity, children who may have previously been exposed to negative appearance evaluations by family members, and individuals who already have an emotional disturbance present (Sarwer, Thompson & Cash, 2005). As more extensive research has been conducted, it is being found that these are far from the only populations affected by body image disturbances. In fact, the 1996 survey related to body dissatisfaction found that 56% of adult women and 43% of adult men were dissatisfied with their overall

appearance (Garner, 1997). More recent statistics show that these numbers are rising. In 2006, an online survey of 27,000 women showed that 59% felt that their bodies were "just okay" or unattractive, while the remaining women felt their bodies were "good" or "great" (Frederick, Peplau, & Lever, 2006).

Typically, most Western women accept an ideal of a thin body figure (Wiseman, Gray, Mosimann, & Ahrens, 1992), where most men seek a muscular figure with a well-developed upper body, yet flat stomach and narrow hips (Leit, Pope, & Gray, 2001). Not only do people seek this ideal for the perceived associated health benefits, but also because of the association that exists between the ideal and self-control, success and acceptance in society (Brownell, 1991). Generally, this ideal is unattainable for most individuals (Thompson, Heinberg, Altabe & Tantleff-Dunn, 1999), thus perpetuating the negative affects of internalizing the thin ideal (Killen et al., 1996).

Thin ideal internalization describes the extent of which a person cognitively places importance on achieving the socially defined ideals and the amount one engages in behaviors to try to reach those ideals (Thompson et al., 1999). In Western society, individuals view their peers' weight and own weight as a reflection of their personal efforts and failure to achieve the thin ideal (Pierce & Wardle, 1997; Quinn & Crocker, 1999). Because of the way people perceive weight as correlated with success, the obese population is likely to be perceived as weak-willed and lacking skills and motivations needed to not only successfully achieve a particular body figure, but also succeed in other areas of life (Crystal, Watanabe & Chin, 1997; Quinn and Crocker, 1999). Consequently, obese individuals are more negatively stigmatized (e.g., less friendly, less likely to succeed) than many other social groups (Bell & Morgan, 2000), including ethnic minorities, women, people in wheelchairs, amputees and people with facial disfigurements (Wing & Jeffery, 1999). Potentially, the reasoning behind the stigmatization is

that obese individuals are held more personally responsible for their weight, whereas, the other groups are unable to change their characteristics (Crandall, 1994).

A popular method taken by obese individuals (both male and female) to attempt to reach the ideal body is through weight loss, including making changes to both their nutritional and physical activity habits. The purpose of this study is to investigate the effect of a weight management clinic on body perception.

CHAPTER II

DEFINITION OF TERMS

Self Perception

While the pressure to obtain a particular body figure is becoming evident in Western society, an individual's self-perception is becoming more important (Grogan, 2007). Self-perception is a reflection of how people think and feel about themselves, including their body attributes and abilities (Lox, Martin, & Petruzzello, 2014). The area of self-perception that is of interest for this study is physical self-concept. Physical self-concept is further broken down into two categories; physical appearance and physical ability. Meaning, physical self-concept is derived from an individual's self-judgment of their physical abilities and physical appearance. Where one person may place more emphasis on physical ability, another may place more on physical appearance. It is believed that whichever domain is valued more by the individual will have a more significant effect on their self-concept (Harter, 2003; Osborne & Jones, 2011).

A closely related construct to physical self-concept is body image. Body image is a multidimensional construct that encompasses not only the judgments about one's body, but also how one sees (perception), thinks (cognition), feels (emotion) and acts (behavior) toward their body (Cash, 2004). The perceptual dimension relates to the picture one forms in their mind of their body. In other words, this dimension is the reflection an individual will see in their mind when they look at their body in the mirror. The cognitive dimension of body image is how one evaluates their body based not only on appearance and level of attractiveness, but also on function including fitness and strength. The emotional dimension relates to the feelings that are experienced in association with the appearance and function of the body. Lastly, the behavioral dimension represents actions, such as clothing choice and activities that one participates in, that

reflect either positive or negative perceptions (thoughts and feelings) of the body (Lox, Martin Ginis, & Petruzzello, 2014).

None of the dimensions of body image are static. Instead, they are dynamic and continually changing with experiences, thoughts and situations. Changes in body image occur when a person's perception of their current body reality becomes closer to, or further away from, their body ideal. Body ideal is associated with how someone thinks and feels their body should look and function, however, body reality is based on actual physical characteristics such as body weight, lean muscle mass, and function.

A healthy body image is a reflection of all four dimensions and is depicted when an individual accurately perceives their body reality, and has positive thoughts and feelings towards their body. Additionally, individuals with healthy body images partake in positive behaviors and actions that correlate with their positive thoughts and feelings. Oppositely, a body image disturbance occurs when one or all of the dimensions contain negative evaluations. For example, this can occur when an individual perceives their current body differently than their body reality (perceptual dimension). Further, a body image disturbance can occur when negative thoughts, emotions or actions are related to an individual's body (cognitive, affective and behavioral dimensions). For example, an obese individual may view himself accurately yet have negative emotions with their current body figure, causing a disturbance.

It is important to recognize the differences between psychological health and physiological health. While there is a potential for an obese individual to accurately view their body and have positive thoughts and emotions related to their body figure, this does not imply that their body is physiologically healthy. From a psychological standpoint, the individual does not present body image disturbances. However, this is not related to the physiological health of

that individual. In this situation, the individual presents a healthy body image, however, they may be lacking knowledge of their current physiological health.

When an individual presents a body disturbance within one or more of the dimensions of body image, it can lead to different outcomes. For example, an individual may utilize their desire to achieve a particular body figure to make positive life changes towards a healthier body in regards to nutrition and physical activity habits. However, concern arises when these negative feelings and thoughts towards the body become negative actions taken to correct the body, regardless of health implications, including extreme weight loss, eating disorders and drug use (Grogan, 2007).

Physical Activity and Exercise

A component of weight management that is involved in energy expenditure is physical activity and exercise. The terms physical activity and exercise are often interchanged, however, they do not have the same meaning. The American College of Sports Medicine (2014) defines physical activity as any bodily movement produced by the contraction of skeletal muscles that results in an increase in caloric usage over resting energy expenditure. Individuals engage in physical activity in order to live their life, however, the amount of variability in time is large from person to person (Caspersen, Powell & Christensen, 1985). Typically, physical activity is broken down into categories, such as work and at leisure (Caspersen et al., 1985).

On the other hand, exercise is a type of physical activity that is planned, structured and involves repetitive bodily movements done to maintain or improve one or more of the components of physical fitness (American College of Sports Medicine, 2014). Within physical fitness, there are five health-related components including cardiorespiratory endurance (the ability of the circulatory and respiratory system to supply oxygen during sustained physical activity), body composition (the relative amounts of muscle, fat, bone and other vital body parts),

muscular strength (the ability of muscle to exert force), muscular endurance (the ability of muscle to continue to perform without fatigue), and flexibility (the range of motion available at a joint) (American College of Sports Medicine, 2014). Additionally, physical fitness is positively correlated to intensity, duration and frequency of the exercise movement (Caspersen et al., 1985).

CHAPTER II

REVIEW OF LITERATURE

Physical Activity, Exercise and Weight Loss

Major organizations have researched the relationship between physical activity and weight loss and have found a significant relationship between the two variables (World Health Organization, 2002; NHLBI, 2011; ACSM, 2014; Weight Control Registry, 2014). Although not the sole contributor to weight reduction, participating in physical activity will promote weight loss by creating a larger negative energy balance (Donnelly et al., 2009). When an individual obtains a greater negative energy balance, they will also see a greater weight loss (ACSM, 2014). Physical activity is often used to create greater energy expenditure than simply partaking in activities of daily living, thus creating a larger negative energy balance. The American College of Sports Medicine (2014) states that individuals seeking weight reduction should engage in a minimum of 150-250 minutes per week of moderate-intensity physical activity. However, long-term weight loss typically is more successful with 250 minutes or greater of physical activity per week with moderate diet restriction (Donnelly et al., 2009).

While many studies have attempted to evaluate physical activity interventions with overweight and obese populations, few studies using physical activity as the sole intervention result in >3% decrease from the baseline weight (Donnelly et al., 2009). Looking deeper at the methodology of previous studies using physical activity interventions, the lack of weight loss produced may be due a dose-response relationship between physical activity and weight loss (Cudjoe, Moss & Nguyen 2007). Studies with participants that engage in <150 minutes/week of physical activity have significantly less weight loss than studies where that participants engage in >200 minutes/week of physical activity (Chambliss, 2005; Jackicic, Marcus, Gallagher,

Napolitano & Lang, 2003; Jackicic, Winters, Lang & Wing, 1999). Specifically, Jackicic et al. (1999, 2003) conducted two separate 12-month studies using total minutes of physical activity as the dependent variable with overweight participants. One hundred and forty eight subjects completed the 18-month initial study that compared the effects of intermittent and continuous exercise on weight loss in a university weight control program. The results of the first study indicated at 18 months the subjects that exercised more than 200 minutes per week lost 4.4lb more than subjects exercising less than 150 minute per week (Jackicic et al. 1999). To reinforce the results of the previous study, the more recent study conducted in 2003 found that at 12 months subjects exercising more than 200 minutes per week lost 3.5lbs more than those that exercised less than 150 minutes per week (Jackicic et al. 2003).

Intensity of exercise is also a factor of caloric output, thus impacting weight loss (ACSM, 2014). Chambliss (2005) assessed the importance of duration and intensity in a 12-month weight loss program with a population of overweight and obese women. The participants were placed into four groups with various exercise duration and intensity levels. Results indicated that there were significant differences in weight loss based on duration and intensity of exercise. Specifically, those in the vigorous (m=4.0 lbs) or moderate (m=3.1lbs) intensity groups with high duration showed significantly greater weight loss than those in the vigorous (m=3.1lb) or moderate (m=2.9lbs) groups with a moderate duration. Based off the means for each group, the study concluded that duration is more important than intensity of physical activity (at least 150 minutes/week) when dealing with weight loss individuals (Chambliss, 2005). Another study conducted in a weight loss program controlled for caloric intake while determining the effects of intermittent and continuous exercise bouts on weight loss in 12 weeks to further investigate the importance of duration of physical activity (Alizadeh, et al., 2013). One group of participants split 40 minutes of physical activity into 3 bouts per day (intermittent), a second group

completed all 40 minutes in one bout per day (continuous), and a third group was a control group with no given exercise program. Alizdeh et al. (2013) found that the intermittent group (*m*=3.33, *sd*=1.80) lost significantly more weight than the group engaging in continuous exercise (*m*=1.23, *sd*=1.60) over the 12 weeks. Thus, leading the authors to believe that moderate, intermittent bouts of exercise are more efficient than continuous exercise in regards to weight loss.

Another study looked at how moderate intensity level home based physical activity interventions, standard behavioral based interventions, and the combination of both interventions differed in weight loss in 6 months in both women and men. Results showed that when standard behavior based interventions were combined with the home physical activity interventions it led to a 1 pound higher weight loss (*m*=4.1lbs) than standard behavioral intervention alone (*m*=3.1lbs) (Gorin et al., 2013). These findings suggest that a greater amount of physical activity throughout the day will allow for greater weight loss over time regardless of diet.

Previous literature strongly suggested that moderate intensity physical activity for a longer duration of time is more important than vigorous intensity activity for weight loss individuals. Also, research has shown that shorter bouts of physical activity throughout the day, opposed to one, long bout of physical activity tends to lend to greater weight loss in the overweight and obese population.

Physical Activity, Exercise and Body Perception

Research suggests there is a relationship between physical activity, exercise and body perception. A previous study looked at the relationship between body image and exercise dependence in order to assess how males and females exercise habits are affected by body image satisfaction or dissatisfaction. While a small effect was found that exercisers had a better body image than nonexercisers of both sexes, the results of this study showed that changes in female Body Mass Index (BMI) tend to be more influential on their body image than participation in

exercise. Conversely, exercise participation is the best predictor of male body satisfaction (Hausenblas, Fallon, 2006). This outcome may reflect the difference in male and female body figure ideals.

Women seek a body ideal resembling a lean and fit physique while men seek a body ideal resembling a lean and muscular physique (Thompson et al., 1999). Hausenblas and Fallon's (2006) results of male body image being more heavily affected by physical activity participation may be related to the fact that exercise, particularly resistance training, will promote a more muscular build. However, the same resistance training for females may not promote the desired thinness of their ideal without calorie reduction and nutritional adaptations (Hausenblas & Fallon, 2006).

These results give reason to believe that exercise does play a significant role in an individual's body satisfaction. However, the study relied on self-reported measures for body composition, which could be inaccurate. Further research conducted with more accurate measures would be beneficial to evaluate the significance of changes in body composition with body image.

While previous studies have shown that exercise positively impacts body image disturbances, research involving the effects of different modes of exercise on body image is still being uncovered. The question remains as to whether there is a significant difference in body image changes if an individual engages in strength training, aerobic training, or a combination of both. Where one study found that larger effects were seen with anaerobic exercise rather than aerobic exercise (Reel, 2007), two other studies found there was no difference in the method of exercise whether it is strength or aerobic training (Campbell & Hausenblas, 2009; Hausenblas & Fallon, 2006). A proposed idea is that strength training may be more effective than aerobic training because it has the potential to give immediate positive feedback about one's capabilities

(Martin Ginis, Eng. Arbour, Hartman, & Phillips, 2005). Another idea is that aerobic training may be more effective due to the association between aerobic exercise and weight loss. Aerobic exercise may allow for a greater perceived change in their body, thus increasing body satisfaction. At this point, research has not investigated which mode of exercise is most effective in changing body image well enough to be fully understood. However, research shows the mode of exercise may be linked to social physique anxiety (SPA), which is a common way of assessing the affective dimension of body image (Frederick & Morrison, 1996; Lantz, Hardy & Ainsworth, 1997).

Along with mode of exercise, other patterns of exercise including location of exercise, clothing worn during exercise, and exercise adherence have along been linked to social physique anxiety and the affective dimension of body image (Frederick & Morrison, 1996; Lantz et al., 1997). SPA is anxiety that an individual feels as a result of their negative body evaluations (Hart, Leary, & Rejeski, 1989) that is also linked to body dissatisfaction. Previous research shows SPA to be correlated with either very low amounts of physical activity or extreme amounts of physical activity. Lantz et al. (1997) found a negative relationship in his study of the general population, specifically, those with higher levels of SPA were less likely to participate in exercise as compared to those with lower levels of SPA. However, Frederick and Morrison (1996) found that higher levels of SPA correlate to a greater number of days per week of exercise engagement.

While much of the research associated with SPA is within younger or athlete populations, one study was conducted that was specific to the middle-aged general population individual. McAuley, Bane, Rudolph and Lox (1995) had 56 men and 58 women participate in a 20 week exercise program to investigate the relationship between post program SPA and changes in body composition and frequency of exercise. The participants of this program were given an

individualized 20 week aerobic exercise program that primarily focused on walking as the mode of exercise. While the results of this program found social physique anxiety to be correlated with how frequent one exercised, the relationship between the two variables dissipated once controlling for body composition changes in the participants. This indicates that SPA may be a reflection of body composition changes that occur due to an increase in exercise participation (McAuley et al., 1995).

Many recent studies have continued to investigate the previous results found in regards to the relationship between SPA, exercise and body composition changes. The recent studies concluded that exercise is not necessarily related to SPA (Atalay & Tülin Gençöz, 2008; Asçı, Tüzün, & Koca, 2006). However, this relationship typically appears in research but is most likely due to the fact that body image is correlated with SPA. At this point, it is difficult to be conclusive on which factor truly impacts SPA, exercise, or the positive change in body image that are associated with an increase in exercise.

The collective body of research looking at the relationship between physical activity and exercise participation and body image at this time generally shows that participation in exercise will improve body image. While studies have evaluated the perceptual, affective, cognitive and behavioral dimensions of body image and exercise participation independently, none have assessed all the dimensions of body image with the same population with weight loss as a measure.

Body Perception and Weight Loss

In a society that frowns upon individuals that are overweight and obese, it is not shocking that overweight and obese men and women have a greater body dissatisfaction than normal

weight, lean individuals, and that the desire to improve one's appearance is the primary motivational factor for weight loss (Rosen, 1996). However, research dealing with body image changes and weight loss has been somewhat inconsistent.

Previous research indicates that weight alone accounts for body dissatisfaction in overweight and obese individuals (Adami et al., 1994; Cash, 1994). However, Rougan, Seddon and Vernon-Roberts (1990) conducted a study with 87 adult obese women that neither encouraged or discouraged the change of eating behaviors and weight loss to further investigate the previous results. The participants attended 10 group sessions that focused on cognitive body image training. They were assessed at 6 months, 1 year and 2 years after completion of the program on self-esteem, depression, self-image, eating attitude, body image and assertion. While weight loss was neither encouraged nor discouraged and did not occur throughout the program, there was a significant improvement in all of the assessed psychological aspects 2 years after completion of the program. These results suggest that body image changes are independent of weight loss.

In conjunction with Rougan et. al's (1990) findings, Foster, Wadden, and Vogt (1997) also found body image changes to be independent from weight loss in their study looking at body image changes of obese women before, during and after weight loss (1997). This study used the Appearance Evaluation (AE) and Body Area Satisfaction (BAS) from the Multidimensional Body-Self Relations Questionnaire (Cash, 1994) to assess participants' body image changes as they progress through the weight loss program. Before treatment, both AE and BAS measures were positively significantly related to self-esteem, yet neither were significantly related to the person's BMI. After 24 weeks of a weight loss program, including exercise, nutrition and cognitive training, the participants lost a mean of 19.4 kg and showed a significant improvement in AE and BAS scores. However, at week 24 the participants that lost an average of 12 kg

showed the same improvements in body image components as participants that lost an average of 27 kg. These findings show that body image changes are not solely reliant on weight loss. From this study alone, it is still difficult to evaluate where the improvements in body image came from: weight loss, cognitive training, or a combination of both.

Carraca et. al (2011) investigated the association between physical activity, exercise and body image in an obese female population in a weight loss program. This particular weight loss program lasted 24 months, with a 12 month weight loss phase and 12 month maintenance phase without intervention. Similar to Hausenblas and Fallon's (2006) study, they also found a significant association between physical activity, exercise and body image measures at both 12 and 24 months. However, these associations were greatly linked to when the physical activity or exercise was structured (planned, organized activity) rather than unplanned (activities of daily living). Meaning, body image was affected when an individual was purposefully participating in physical activity rather than being active due to activities of daily life. These results also showed that a significant decrease in body image dissatisfaction occurred in both the intervention group and control group, regardless of the fact that average weight loss was higher in the intervention group (7.3%) than the control group (1.7%) (Carraca, 2011). This finding indicates that body satisfaction was improved due to exercise participation, whether weight loss was achieved or not. Therefore, actual weight loss or physiological change may not be what leads to body image changes, as once thought (Martin Ginis, McEwan, Josse & Phillips, 2012).

Physical activity and exercise are just one component of a healthy lifestyle. Researchers have been investigating the effects of exercise along with eating habit change on weight loss and weight management through weight management clinics at various universities (e.g., Brown University, University of North Carolina Chapel Hill, University of Pittsburgh). One study (Palmeira et al., 2010) of women with a BMI between 25 and 40 kg/m^2 participating in a 16

month behavioral obesity treatment program was done to assess whether changes in body image and psychological well-being were predictors of weight change during the program and at follow up. This study included a weight loss phase for the first 4 months followed by a 12-month weight maintenance phase. Based on the findings, the researchers concluded that significant improvements were seen in body size satisfaction, body attractiveness and total mood disturbance from baseline to 4 months to 16 months. The results showed that a short-term (baseline to 4 months) improvement in body size dissatisfaction and mood were predictive of long-term weight loss (baseline to 16 months) after accounting for initial weight loss. Additionally, body size dissatisfaction and self-esteem continued to positively increase throughout the maintenance phase while independent from weight loss. Because body satisfaction continued to increase throughout the weight maintenance phase while independent from weight loss, further research is needed to better understand the additional factors that lead to an improvement in body satisfaction other than physiological changes (weight loss).

Previous research indicates that body image changes as a result of physiological changes of an individual's body, and other research indicates that body image can be positively impacted regardless of physiological changes. Because body image is such a complex psychological concept, it is difficult to pinpoint why changes occur and exactly what factors influence those changes.

Purposes and Hypotheses

Based on the previous literature it is clear that there is a need for more research investigating the relationship between physical activity, weight loss and body perception. The following purposes were addressed in the study;

1. Assess the relationship between participation in a weight management clinic, and perception and body ideal. It is hypothesized that participation in a weight management clinic will lead to a significant decrease in the difference between current body perception and ideal body perception.
2. Assess the relationship between participation in a weight management clinic, and the MBSRQ-AS subscales (appearance evaluation (AE), appearance orientation (AO), overweight preoccupation (OWP), self-classified weight (SCW), and body area satisfaction (BAS)). It is hypothesized that participation in a weight management clinic will lead to a significant improvement on all MBSRQ-AS subscales.
3. Assess the relationship between participation in a weight management clinic and social physique anxiety. It is hypothesized that participation in a weight management clinic will lead to a significant decrease in SPA.
4. Assess the relationship between weight loss, MBSRQ-AS subscales (appearance evaluation (AE), appearance orientation (AO), overweight preoccupation (OWP), self-classified weight (SCW), and body area satisfaction (BASS)), social physique anxiety, and current and ideal body difference. It is hypothesized that participation in a weight management clinic and the MBSRQ-AS subscales will be significantly positively correlated. Social physique anxiety and current versus ideal body difference will be negatively correlated with the MBSRQ-AS subscales. No other hypotheses were made in regards to the correlations between measures.

CHAPTER IV

METHODS

Participants

Participants were recruited using convenience sampling. Individuals used in this study were participants in the Weight Management Clinic (WMC) at Southern Illinois University Edwardsville (SIUE). Participants were recruited via word of mouth, SIUE campus email and newsletter, brochures, and local St. Louis Metropolitan and Madison county newspapers. In order for an individual to be eligible for the WMC, the person must have been between the ages of 18 and 65 and have had a BMI between 25 and 45 kg/m^2.

Cohort 1 began the program in November, 2014 with 25 participants and a second cohort began the program in January, 2015 with 16 participants to have a overall sample size of N=41, including 25 male and 16 female participants. Of the participants, the mean age was 46.5 years with a minimum of 21.6 years and maximum of 60.6 years. Prior to 12-week testing, one participant was asked to leave the study for being noncompliant, one participant had to leave the program due to pregnancy and two participants left for unknown reasons. Therefore, the data collection for this study had a final sample size of N=37.

Measures

Anthropological measurements

Height and body weight were recorded and used to calculate the subject's BMI. A participant's BMI is calculated by using the equation BMI=weight (kilograms)/height $(meters)^2$. Body composition was evaluated on the basis of total fat mass and fat-free mass using intelligent dual-energy x-ray absorptiometry (iDXA). See table 1 for statistical values.

Multidimensional Body Self Relations Questionnaire-Appearance Scale (MBSRQ-AS: Cash, 2000)

The MBSRQ-AS is a 34-item questionnaire that is an abbreviated version of the 69-item MBSRQ. The MBSRQ-AS consists of 5 subscales including appearance evaluation (satisfaction of one's looks, feelings of physical attractiveness or unattractiveness), appearance orientation (extent one invests in their appearance), overweight preoccupation (assess a construct reflecting fat anxiety, weight vigilance, dieting and eating restraint), self-classified weight (reflects how one perceives and labels their weight), and body area satisfaction scale (satisfaction with specific areas of one's body appearance). The items are scored on a 1 through 5 scale (e.g., 1=definitely disagree, 3=neither disagree or agree, 5=definitely agree) on how they feel about their body in specific situations. The MBSRQ-AS has been shown to be valid and reliable with correlation coefficients from 0.70 to 0.94 (Cash, 2000). The final scores for each subscale were calculated by using the following equations (* denotes reverse scoring) (Cash, 2000):

Appearance Evaluation = (Q3+Q5+Q9+Q12+Q15-Q18*-Q19*+12)/7

Appearance Orientation = (Q1+Q2+Q6+Q7+Q10+Q13+Q17+Q21-Q11*-Q14*-Q16*-Q20*+24)/12

Body Areas Satisfaction = (Q26+Q27+Q28+Q29+Q30+Q31+Q32+Q33+Q34)/9

Overweight Preoccupation = (Q4+Q8+Q22+Q23)/4

Self-Classified Weight = (Q24+Q25)/2

Body Assessment Scale (BAS: Gardner, Stark, Jackson & Friedman, 1999).

The BAS is used to assess to what degree an individual is dissatisfied with their body. This survey includes male and female silhouettes that the participant will select to accurately reflect their current body and their ideal body. The participants select the silhouette that they feel most accurately represents their current body figure and their most ideal body figure. Body

disturbance are shown in the difference between the two selected figures. The BAS has been found to be valid and reliable from 0.68 to 0.74 (Gardner & Brown, 2009).

Social Physique Anxiety Scale (SPAS: Hart, Leary, & Rejeski, 1989).

The SPAS measures social anxiety related to physique. SPAS is a 9-item self-report scale developed to assess the degree to which people become anxious when others observe or evaluate their physique. Participants answer questions such as "I wish I wasn't so uptight about my physique/figure" and "When in a bathing suit, I often feel nervous about the shape of my body" on a Likert-type scale (1 = not at all characteristics of me, 5 = extremely characteristics of me). The SPAS has been found to be valid and reliable with score from 0.74 to 0.90 (Petrie, Diehl, Rogers & Johnson, 1996).

Procedure

The Weight Management Clinic at Southern Illinois University Edwardsville has a weight loss phase of the program lasting 12 weeks. Throughout the weight loss phase, subjects were placed on a caloric restriction diet with an energy intake of 1200-1800 kcal/day. The participants were given Healthy Meal Resources (HMR) prepackaged meals and meal replacement shakes, which were the participant's main source of energy intake, along with suggested five fruit and vegetable servings daily. Subjects were given a pedometer in order to track their suggested daily step value of 10,000 steps. Additionally, they were instructed to participate in a minimum amount of physical activity minutes per week beginning with 45 minutes per week and gradually increasing to 300 minutes per week of exercise. The participants were encouraged to utilize walking as their primary means of exercise. The participants were encouraged to engage in shorter bouts of physical activity throughout the duration of the day to meet the requirements rather than one long bout of physical activity. In order to track this data, the participants were given a weekly tracking sheet for shakes, entrees,

fruits and vegetables, steps and physical activity minutes. These sheets were emailed to the group leader on a designated day of the week and entered into a master data file.

All physiological measurements and behavior assessments were administered at baseline and 12 weeks. Body weight was recorded using a digital scale accurate to ± 0.1 kg. Body composition (total body fat and fat-free mass) was measured by intelligent dual energy x-ray absorptiometry (iDXA). The MBSRQ-AS, SPAS and BAS behavior assessments were administered at baseline and 12 weeks.

CHAPTER V

RESULTS

The results of this study were obtained from a collective data sample from both cohorts of this program. In order to determine if data from cohort one and cohort two could be collapsed, independent t tests were run for all variables (weight loss, MBSRQ-AS subscales, SPA, BASS) to determine if significant differences were present between cohorts. There were no significant differences between the cohorts found for any of the variables for this study and therefore, the cohorts could be collapsed into one group. Also, after evaluating the reliability of the data collected from the program, the physical activity weekly data was unreliable for purposes of this study due to inconsistency in type of activity reported and tracking sheets being received by all participants.

A Pearson correlation was calculated to examine the relationship between total weight loss, MBSRQ-AS subscales, SPA and current and ideal body difference. There were no significant correlations between total weight loss and any of the MBSRQ-AS subscales, SPAS or the BAS. However, there were correlations present between the subscales. See Table 7 for all correlations.

A 2 x 2 repeated measures ANOVA was run in order to determine the effect for time (baseline, 12 weeks) and weight loss (goal achieved, goal not achieved) on the difference between current and ideal body perceptions on the BAS. The main effect for time was significant ($F(1,35)=39.198$, $p=0.000$, $\eta_p^2=0.528$, $\beta=1.000$). There was no significant main effect found for weight loss ($F(1,35)=0.40$, $p>0.05$, $\eta_p^2=0.001$, $\beta=0.054$). Additionally, there was no significant interaction between time and weight loss ($F(1,35)=2.916$, $p>0.05$, $\eta_p^2=0.077$, $\beta=0.383$). Although there was a significant difference in current and ideal body silhouettes

between baseline (M=3.125 SD=0.992) and 12 weeks (M=2.189 SD=1.151), there was not a significant difference between participants that met the 10% weight loss goal and those that did not in regards to whether they showed positive improvement. See Table 3.

A 2 x 2 repeated measures ANOVA was run in order to determine the effect of time (baseline, 12 weeks) and weight loss (goal achieved, goal not achieved) on social physique anxiety. The main effect for time was significant (F(1,35)=8.089, p=0.007, η_p^2=0.188, β=0.790). There was no main effect for weight loss (F(1,35)=0.077, p>0.05, η_p^2=0.002, β=0.058). Additionally, there was no significant interaction between time and weight loss (F(1,35)=0.033, p>0.05, η_p^2=0.188, β=0.054). While there was a significant positive improvement in social physique anxiety from baseline (M=28.950 SD=7.182) to 12 weeks (M=26.324 SD=7.180), there was not a significant difference in improvements between participants that met the 10% weight loss goal and those that did not meet the weight loss goal. See Table 2.

A 2 x 2 repeated measures ANOVA was run in order to determine the effect for time (baseline, 12 weeks) and weight loss (goal achieved, goal not achieved) on the appearance evaluation subscale of the MBSRQ-AS. The main effect for time was significant (F(1,35)=40.703, p=0.000, η_p^2=0.538, β=1.000). There was no main effect for weight loss (F(1,35)=0.066, p>0.05, η_p^2=0.002, β=0.057). Additionally, there was no significant interaction between time and weight loss (F(1,35)=2.682, p>0.05, η_p^2=0.538, β=0.357. While there was a significant positive improvement in the participants feeling of attractiveness from baseline (M= 2.351 SD=0.285) to 12 weeks (M=2.87 SD=0.460), this difference was found regardless of weight loss. See Table 2.

A 2 x 2 repeated measures ANOVA was run in order to determine the effect for time (baseline, 12 weeks) and weight loss (goal achieved, goal not achieved) on the appearance orientation subscale of the MBSRQ-AS. The main effect for time was significant

($F(1,35)=6.887$, $p=0.013$, $\eta_p^2=0.164$, $\beta=0.723$). There was no main effect for weight loss ($F(1,35)=0.001$, $p>0.05$, $\eta_p^2=0.000$, $\beta=0.050$). Additionally, there was no significant interaction between time and weight loss ($F(1,35)=0.297$, $p>0.05$, $\eta_p^2=0.008$, $\beta=0.083$). While there was a significant increase in the extent participants invested in their appearance from baseline ($M=2.964$ $SD=0.269$) to 12 weeks ($M=3.086$ $SD=0.269$), this difference was found regardless of weight loss. See Table 2.

A 2 x 2 repeated measures ANOVA was run in order to determine the effect for time (baseline, 12 weeks) and weight loss (goal achieved, goal not achieved) on the body areas satisfaction subscale of the MBSRQ-AS. The main effect for time was significant ($F(1,35)=18.605$, $p=0.000$, $\eta_p^2=0.347$, $\beta=0.987$). There was no main effect for weight loss ($F(1,35)=0.165$, $p>0.05$, $\eta_p^2=0.005$, $\beta=0.068$). Additionally, there was no significant interaction between time and weight loss ($F(1,35)=0.010$, $p>0.05$, $\eta_p^2=0.000$, $\beta=0.051$. While there was a significant positive improvement in satisfaction of various areas of the participant's bodies from baseline ($M=2.688$ $SD=0.527$) to 12 weeks ($M=3.114$ $SD=0.657$), this difference was found regardless of weight loss. See Table 2.

A 2 x 2 repeated measures ANOVA was run in order to determine the effect for time (baseline, 12 weeks) and weight loss (goal achieved, goal not achieved) on the overweight preoccupation subscale of the MBSRQ-AS. The main effect for time was significant ($F(1,35)=23.022$, $p=0.000$, $\eta_p^2=0.397$, $\beta=0.997$). There was no main effect for weight loss ($F(1,35)=0.246$, $p>0.05$, $\eta_p^2=0.007$, $\beta=0.077$). Additionally, there was no significant interaction between time and weight loss ($F(1,35)=0.179$, $p>0.05$, $\eta_p^2=0.005$, $\beta=0.070$. While there was a significant increase in participants' fat anxiety, weight vigilance, dieting and eating restraint from baseline ($M=2.723$ $SD=0.606$) to 12 weeks ($M=3.243$ $SD=0.597$), this difference was found regardless of weight loss. See Table 2.

A 2 x 2 repeated measures ANOVA was run in order to determine the effect for time (baseline, 12 weeks) and weight loss (goal achieved, goal not achieved) on the self-classified weight subscale of the MBSRQ-AS. The main effect for time was significant ($F(1,35)=10.827$, $p=0.002$, $\eta_p^2=0.236$, $\beta=0.892$). There was no main effect for weight loss ($F(1,35)=1.454$, $p>0.05$, $\eta_p^2=0.040$, $\beta=0.217$). Additionally, there was no significant interaction between time and weight loss ($F(1,35)=0.599$, $p>0.05$, $\eta_p^2=0.017$, $\beta=0.117$. While there was a significant positive improvement in how the participants perceived and labeled their weight from baseline ($M=4.311$ $SD=0.477$) to 12 weeks ($M=3.919$ $SD=0.750$), this difference was found regardless of weight loss. See Table 4.

CHAPTER VI

DISCUSSION, CONCLUSIONS AND RECOMMENATIONS

Discussion of Findings

Research is still trying to understand the relationships between obesity and the associated psychological implications; however, previous literature has shown a link between weight and body image disturbances (Friedman et al., 2005). Literature shows that obese individuals typically present higher levels of body dissatisfaction than normal weight individuals (Schwartz, Brownell, 2004). The body dissatisfaction that is prevalent in overweight and obese individuals often is the primary motivation for them to attempt weight loss (Rosen, 1996). The overall purpose of this study was to evaluate the effect of a weight management clinic, incorporating both physical activity and nutritional changes, on body perception.

The first purpose of this study was to assess the relationship between participation in a weight management clinic, body perception and body ideal. It was hypothesized that participating in a weight management clinic would lead to a decrease in the difference between current body perception and body ideal over the course of the 12 week program. Based on the findings, this hypothesis was verified as the participants' difference between their body ideal versus perceived actual body size decreased from baseline to 12 weeks. An assessment of means indicated that ideal body perception did not significantly change from baseline to 12 weeks, however, the selection for current body perception did. This finding occurred regardless of if the participant achieved the program goal of a 10% weight loss or not.

The second purpose of this study was to assess the relationship between participation in a weight management clinic and the five subscales of the MBSRQ-AS. It was hypothesized that there would be a positive improvement in appearance evaluation, appearance orientation, body

areas satisfaction, overweight preoccupation, and self-classified weight with participation in a weight management clinic over time. Scores on all five subscales improved over the course of 12 weeks.

Higher scores on the Appearance Evaluation subscale mean that the participant's feel mostly positive and satisfied with their appearance. Similar to the Appearance Evaluation subscale, Body Areas Satisfaction subscale scores that are higher show that one is more satisfied with specific areas of their bodies such has hair, facial features, lower, middle and upper torso and muscle tone, opposed to an overall sense in the Appearance Evaluation subscale. As those subscales are positively correlated with each other, they are both negatively correlated with the Self-Classified Weight subscale (See Table 7). Lower scores on the Self-Classified Weight subscale show the participant's to perceive and label their weight to be less on a scale from very underweight to very overweight. As an individual became more satisfied with their body, they perceived and labeled their weight to be less.

While Appearance Evaluation and Body Area Satisfaction scores increased over time, self-classified weight scores decreased. When participants enter a weight management clinic, it is common for those entering a program to be looking to lose weight and obtain a smaller body figure, therefore, it is positive that the participants classified their weight to be less at 12 weeks (M=3.919 SD=0.750) than at baseline (M=4.311 SD=0.476). In conjunction, the participants felt more satisfied with their physical appearance and have more feelings of attractiveness over all (appearance evaluation) and within specific areas of their body (body area satisfaction).

Appearance Orientation and Overweight Preoccupation scores also increased from baseline to 12 weeks meaning that participants are now more invested in their appearance (Appearance Orientation) and reflect more fat anxiety, weight vigilances, dieting and eating restraint (Overweight Preoccupation). While for other populations of individuals, this may be

viewed as a negative outcome, for participants in a weight management clinic this is expected. The participants have become more aware of these factors because they are now thinking about them on a daily basis. Now, they are logging their physical activity, food intake, and weight change every week. Also, they attend weekly meetings with topics such as food choices and exercise habits. Because of this, it is expected to see scores related to becoming more aware of the above topics increase.

The third purpose of this study was to assess the relationship between participation in a weight management clinic and social physique anxiety. It was hypothesized that social physique anxiety would decrease with participation in a weight management clinic. This hypothesis was verified as the participants had less feelings of anxiousness about their bodies after 12 weeks in the program than they did at baseline. These individuals feel more comfortable in their own skin and are less as anxious about their bodies.

When looking at body perception as a whole, the results show that participating in a weight management clinic has positively impacted each dimension of body image. A very important aspect of the results, collectively, is that all of the positive improvements in body perception (perceptual, cognitive, emotional and behavioral) occurred regardless of if the participant met the weight loss goal was achieved of not. The goal of this program was to achieve a 10% weight loss from baseline to 12 weeks; some participants met and exceeded this goal (n=16), while some fell short (n=21). However, this had no significant effect on the improvements that were seen in body perception in that the participants that met the weight loss goal improved their body perception, yet so did the participants that did not meet the weight loss goal. These results are consistent with previous results that body image changes are independent of weight loss (Rougan, Seddon & Vernon-Roberts, 1990; Foster, Wadden & Vogt, 1997; Martin Ginis, McEwan, Josse & Phillips, 2012).

A possible explanation for the improvements in body image, regardless of weight loss, could be the increase in physical activity and exercise. Carraca et al. (2011) found a relationship between improvements in body satisfaction and exercise participation throughout a 24-month study, regardless of weight loss. However, these results were strongly related to when the physical activity or exercise was planned, organized activity rather than unplanned activities of daily living. One of the main components of the SIUE weight management clinic was progressively increasing physical activity to the recommended 300 minutes per week. This physical activity was instructed to be planned and purposeful, similar to the participants in the above study. The participants of the study appear to have continuously increased their physical activity and exercise throughout the duration of the program (See table 6 and 7). Unfortunately, the reported data for physical activity minutes could not be used to make reliable conclusions due to inconsistent reports and the wide range of activities that were reported as physical activity. However, this may explain the improvements in body image as the participants were purposefully participating in physical activity to meet each week's recommendations.

The three main components to the SIUE weight management clinic are nutrition, physical activity and psychological changes dealing with weight loss and maintenance. While we cannot pinpoint any specific component that causes body image improvements, we can conclude that the program, as a whole, leads to significant improvements. By seeing individuals that did not obtain significant weight loss still improving their body image, we are able to conclude that the picture one creates of their body in the mind, the way that picture is evaluated, and the way one feels about that picture and behaves based off those feelings is tied to psychological components that are altered during this clinic rather than actual weight change.

Improvements in body image can lead to a wide variety of other positive behaviors in this population. Previously, research has shown that obese individuals are prone to engage in binge

eating (Cargill, Clark, Pera, Niaura & Arbams, 1999), which is detrimental to weight loss and improving one's health. Cargill et al. (1999) found that poor body image was significantly related to binge eating and that body image, specifically a sense of shame and concern with appearance, had the strongest relationship to binge eating in relation to other variables (depression and weight self efficacy). Another study (Rosen, Orosan, & Reiter, 1995) conducted a cognitive behavioral therapy program without any implementations for changes in eating habits, exercise or weight loss. Again, this study resulted in the participants improving their body image, yet changes in weight did not occur. These participants also reported less binge eating and feelings of being more in control of their food choices and intake. In 12 weeks, some participants of the weight management clinic may not have made much physiological progress; however, they did see significant progress with their body image. This improvement in body image could potentially lead to the participants making better nutritional choices and decreasing the likelihood of engaging in binge eating and continue to work towards healthy physiologically changes, including weight loss.

Another positive outcome that could potentially come from improvements in body image is a shift in motivation. Social physique anxiety is related to the affective/emotional dimension of body image involved with the feelings associated with evaluations of one's body, particularly feelings of anxiousness. Social physique anxiety has previously been related to motives for exercise participation (Frederick & Morrison, 1996). Specifically, Frederick and Morrison (1996) found that individuals with high scores of SPA reported higher extrinsic motivation for partaking in exercise than those who have lower SPA scores. Meaning, individuals that have higher SPA typically participate in exercise for external reasons, such as appearance, rather than for health or enjoyment reasons. This type of motivation for exercise is not optimal for adherence and individuals are unlikely to continue the participation for these reasons for an

extended period of time (Frederick & Ryan, 1993). Teixeria et al. (2006) compared weight loss of those with low, intermediate and high levels of intrinsic exercise motivation. This study found that individuals with higher levels of exercise intrinsic motivation lost significantly more weight than individuals with low levels of exercise intrinsic motivation from baseline to 4 months. Interestingly, only those with high exercise intrinsic motivation continued to lose weight from 4 months to 16 months, while those with low and intermediate levels of exercise motivation actually regressed their weight loss progress.

The participants of the weight management clinic saw improvements in SPA, regardless of weight change. This is positive because a decrease in SPA could potentially lead to an increase in intrinsic exercise motivation, thus increasing the likelihood of continued exercise participation. Exercise participation is an important piece to not only weight loss, but also related health benefits such as decreased risk for heart disease, diabetes and high blood pressure (Humphreys, McLeod & Ruseski, 2013). Potentially, the decrease in SPA could lead to a continuation of this positive behavior change in obese and overweight individuals.

Regardless of physiological change, psychological changes are able to occur in participants throughout a weight loss process. Weight loss and health behavior change occurs at a different rate for each specific person; some quickly and others slowly. However, regardless of one's weight loss, if they can be impacted psychologically, they are more likely to continue engaging in health behaviors that can lead to weight loss (eating and exercise habits). This concept could be used by professionals in the field to help promote healthy behaviors in clients by working towards improving their body image including how they view, evaluate and feel about their bodies. As there are many important aspects in the field of health and fitness, body image improvements could potentially leave clients with improvements both psychologically and physiologically.

Limitations of Research

As there are with every research study, this study did have a few limitations that could be improved in future weight management clinic studies. During baseline testing, body image surveys were given to the participants after they were weighed and DXA scan body review was displayed. Seeing this information prior to completing their body image surveys may have altered their body perception at that time. Additionally, testing protocol for weight measurements were not consistent with a specific time of measure during the day. Since weight will fluctuate throughout the day, in the future it would be advantageous to weigh participants in the morning, at a consistent time, to get the most accurate and reliable reflection of weight change.

Weekly data collection was also a limitation of this study. While the tracking sheets given to the participants would have accurately relayed weekly data, the participants did not consistently submit their data sheets to their group leader on time, if ever. Therefore, the reported data related to physical activity minutes was unreliable for the purposes of this study. In future research, more advanced technology with automatic activity tracking could be used to ensure more accurate and reliable data reports and submission.

The last limitation of this study was attendance in the weekly meetings. While the program was set up to have a four absence policy before being removed from the program, these guidelines were loosely enforced allowing participants to continue in the study without attending weekly meetings frequent enough to receive all information given by the clinic.

Future Research

While this research study did obtain significant results that can be utilized in the field of body image, further research can build the results of this study to better understand body image in overweight and obese adult populations. This research study showed that a weight management clinic may, on its own, positively impact body image regardless of actual weight change. Future research should investigate, whether specific parts of a weight management clinic (i.e., nutritional changes, exercise changes, educational programming) are more influential on changes in body image than others. Additionally, it would be beneficial to evaluate how body image improvements relate to adherence to nutrition and exercise programs and extrinsic and intrinsic motivational factors for continued weight loss or maintenance for an extended period of time.

Table 1. Physiological Statistics

Variable	N	Minimum	Maximum	Mean	St. Dev.
Height (in)					
Baseline	40	61.00	74.25	66.61	3.15
12 weeks	37	61.00	74.50	66.78	3.18
Change	3	0.00	0.25	0.17	0.03
Weight (lbs)					
Baseline	40	143.70	288.60	217.78	37.60
12 weeks	37	130.10	255.70	196.03	35.51
Change	3	13.60	32.90	21.75	2.09
BMI (kg/m^2)					
Baseline	40	24.20	50.70	34.15	6.36
12 weeks	37	23.80	42.30	30.88	5.31
Change	3	0.40	8.40	3.27	1.05
Body Fat (%)					
Baseline	40	22.10	55.90	42.61	6.93
12 weeks	37	14.90	53.50	39.64	8.41
Change	3	7.20	2.40	2.97	1.48

Table 2. Multidimensional Body Self Relations Questionnaire-Appearance Subscales

Subscale	N	Minimum	Maximum	Mean	St. Dev.
Appearance Evaluation					
Baseline	37	1.71	3.00	2.35	0.28
12 weeks	37	1.57	3.86	2.87	0.46
Appearance Orientation					
Baseline	37	2.33	3.50	2.96	0.27
12 weeks	37	2.58	3.67	3.09	0.29
Body Areas Satisfaction					
Baseline	37	1.44	3.67	2.69	0.53
12 weeks	37	1.56	4.11	3.11	0.66
Overweight Preoccupation					
Baseline	37	1.50	4.00	2.72	0.61
12 weeks	37	1.75	4.25	3.24	0.75
Self-Classified Weight					
Baseline	37	3.50	5.00	4.31	0.48
12 weeks	37	1.50	5.00	3.92	0.75

Scores were calculated using the MBSRQ-AS equations for each subscale describes in measures section.

Table 3. Body Assessment Scale

Variable	N	Minimum	Maximum	Mean	St. Dev.
Current					
Baseline	37	5.00	9.00	7.93	1.02
12 weeks	37	3.00	9.00	6.54	1.46
Ideal					
Baseline	37	3.00	6.00	4.80	0.99
12 weeks	37	2.00	6.00	4.35	0.95
Difference					
Baseline	37	1.00	6.00	3.13	0.99
12 weeks	37	0.00	5.00	2.19	1.15

Table 4. Social Physique Anxiety

Variable	N	Minimum	Maximum	Mean	St. Dev.
SPA					
Baseline	37	17.00	43.00	28.95	7.18
12 weeks	37	12.00	43.00	26.32	7.18

Table 5. Steps

Variable	N	Minimum	Maximum	Mean	St. Dev.
Steps					
Week 1	25	11930.00	72256.00	46667.88	18255.10
Week 2	37	3556.00	77286.00	43323.73	18571.66
Week 3	37	13235.00	79159.00	45680.14	16811.62
Week 4	36	2450.00	84748.00	46339.36	19611.87
Week 5	36	23023.00	86552.00	46663.44	14284.31
Week 6	35	10080.00	87445.00	45051.00	17781.42
Week 7	34	0.00	128391.00	50059.76	23673.76
Week 8	31	5428.00	102103.00	47025.16	23217.27
Week 9	32	7762.00	95693.00	51148.88	20625.36
Week 10	32	22621.00	95325.00	53294.19	17417.23
Week 11	26	25634.00	99351.00	51687.04	17162.77

Table 6. Physical Activity Minutes

Variable	N	Minimum	Maximum	Mean	St. Dev.
Minutes					
Week 1	25	0.00	380.00	125.92	106.57
Week 2	38	0.00	395.00	104.26	111.30
Week 3	37	0.00	604.00	149.38	145.49
Week 4	36	0.00	510.00	141.36	127.41
Week 5	36	0.00	450.00	147.61	107.82
Week 6	36	0.00	420.00	163.11	114.21
Week 7	36	0.00	660.00	180.75	152.27
Week 8	31	0.00	525.00	193.97	145.23
Week 9	32	0.00	510.00	196.47	139.36
Week 10	32	0.00	660.00	219.16	143.36
Week 11	26	0.00	410.00	183.46	116.21

Table 7. Correlations

Subscale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Total Weight Loss	1														
2. BL AE	-.14	1													
3. BL AO	.01	.24	1												
4. BL BASS	.14	.09	.32	1											
5. BL OWP	.07	.05	.38*	-.31	1										
6. BL SCW	.10	.01	-.11	-.54**	.29	1									
7. BL SPA	.01	-.13	-.06	-.58**	.52*	.37*	1								
8. BL BAS DIFF	.01	-.06	.02	-.57**	.43**	.34*	.35*	1							
9. 12WK AE	.18	.08	.19	.49**	-.31	-.32	-.37*	-.44**	1						
10. 12WK AO	-.05	.30	.54**	-.01	.47**	-.06	.15	.26	-.03	1					
11. 12WK BASS	.28	.02	.08	.52**	-.34*	-.29	-.22	-.57**	.81**	-.03	1				
12. 12WK OWP	.03	.19	.03	-.40*	.44*	.15	.54**	.28	-.32	.28	-.18	1			
13. 12WK SCW	-.25	-.05	-.23	-.37*	-.02	.34*	.24	.28	-.56**	-.17	-.55**	.06	1		
14. 12WK SPA	-.70	-.00	.07	-.47**	.58*	.28	.60**	.52**	-.74**	.24	-.66**	.38*	.46**	1	
15. 12WK BAS DIFF	-.17	.09	.11	-.236	.33*	.32	.18	.61**	-.64**	.20	-.68**	.15	.66**	.58**	1

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