2021

Investigating Body Dissatisfaction, Obesity, & Eating Pathology: African American Adolescent Girls & Mothers

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Investigating Body Dissatisfaction, Obesity, & Eating Pathology: African American Adolescent Girls & Mothers

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A Master's Thesis Defense

Submitted to the Department of Psychology

in fulfillment of the requirements for a

Master of Science Degree in Psychological Science

University of North Florida

D. Witherspoon, PhD

THESIS CERTIFICATE OF APPROVAL

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Abstract

Body dissatisfaction is a globally prevalent issue among adolescents, particularly for those living in industrialized societies (Griffith et al., 2017). Body dissatisfaction is considered a central component of obesity intervention (Huh et at., 2011; Mitola et al., 2007) and eating disorder etiology (Kelly et al., 2005; Saunders & Frazier, 2016). It predominantly effects females and is commonly found among those with eating disorders and those who struggle with obesity or have higher BMI (Kelly et al., 2005; Saunders & Frazier, 2016). However this is contradicted in African American females, the majority of research has found low levels of body dissatisfaction, high rates of obesity, and low levels of eating pathology in this understudied population(Cotter et al. 2015; Epperson et al., 2013; Grabe & Hyde, 2006). Additionally, very little research has investigated the relation of these variables between mothers and daughters in the U.S. (Moiza et al., 2015). In the present study it was found that there is a higher prevalence of dissatisfaction among African American girls than previously thought. Consistent with previous research, high rates of obesity and relatively low prevalence of eating pathology symptoms were found among African American mothers and daughters. It was also found that both adolescents and mothers inaccurately report their adolescents current body size with a tendency to underestimate. Finally, it was also found that mother's satisfaction moderated dissatisfaction in adolescent girls who were satisfied or dissatisfied wanting to be smaller.

Keywords: Body Dissatisfaction, Obesity, Eating Pathology, African American, Adolescents, Mothers & Daughters

Investigating Obesity, Body Dissatisfaction, & Eating Pathology: African American Adolescent Girls and Their Mothers

Obesity

The epidemic of obesity is one of the most prevalent in the U.S. (Hales et al., 2017). Obesity or being overweight is defined as an amount of excess body fat that is harmful to one's health and overall well-being (Brewis, 2010; World Obesity Federation, 2020). Body mass index (BMI) is the leading method in assessing obesity (Brewis, 2010; Yepes et al., 2015). Height and weight are calculated relative to the average weight that is considered normal/healthy for a person of their stature, in other words a person's BMI score is based on how close or far off their current weight is to the healthy or typical weight that would be expected of a person of their height (Brewis, 2010). In adults a BMI score less than 18.5 is considered underweight, 18.5 or below 25 is considered normal weight, 25 or less than 30 is considered overweight, and obese is a BMI score that is over 30 (CDC, 2017). Child BMI is assessed based on growth charts that are specific for a child's age and sex and categorized by percentile, below the 5th percentile is considered underweight, within the 5th or 84th percentile range is considered normal weight, 85th but less than the 95th percentile range are considered overweight, and anyone with a BMI in the 95th or greater percentile are considered obese (CDC, 2018). In 2015-2016 the National Center for Health Statistics (NCHS) found 39.8% of adults (≥ 20 y/o) and 18.5% of children (2-19 y/o) in the United States were obese (Hales et al., 2017).

In adults, obesity is most prevalent among those age 40 to 59 (42.8%), followed by those 60 or over (41%), and less in age 20 to 39 (35.7%) (Hales et al., 2017). This distribution is expected, given that as people age they put on more weight (Brewis, 2010). Beyond distribution,

these rates are still high (Hales et al., 2017). There also seems to be differences in the prevalence of obesity across ethnicity. More specifically, close to half of Hispanic Americans (47%) and African Americans (46.8%) suffer from obesity. In comparison, only 37.9% of Anglo Americans and 12.7% of Asian Americans are obese in the US (Hales et al., 2017). The highest rates of obesity were found among women, specifically African American women (54.8%) and Hispanic American women (50.6%) (Hales et al., 2017). In 2017 and 2018 the highest prevalence of obesity was also found among African Americans and slightly increased when compared to rates in 2015 and 2016. Additionally, African American women were found to have the highest prevalence found across all ethnicities and genders (Hales et al., 2020). This demonstrates a consistent and concerning increased prevalence of obesity in African American women in the United States (Hales et al., 2017, 2018, 2020).

Among the children assessed by the NCHS in 2015-2016, 20% of 12-to-19-year old's, 18.4% of 6 to 11 years old's, and 13.9% of two to five year old's were obese (Hales et al., 2017). The highest rates were also among Hispanic American (25%) and African American children (22 %). The gap in prevalence between the rates of obesity in Hispanic and African American children vs. Angl- American (14.1%) and Asian American (11.7%) children, mirrors findings among adults. In terms of gender, and the highest rates for Hispanic and each ethnicity, 28% of boys and 23.6% of Hispanic American girls, 25% of girls and 19% of African American boys, 14.6% of boys and 13.5% of Anglo-American girls, 11.7% of boys and 10% of Asian American girls were obese. With the exception of Hispanic boys, it remains that obesity continues to influence girls more often than boys, where African American girls are found to have the highest rates (Hales et al., 2017).

Health Consequences of Obesity

The high rates of obesity in African American females is worrisome for their current and future health. Obese adolescent females are at risk for developing a variety of negative health outcomes such as, polycystic ovarian syndrome, cardiovascular disease, and type 2 diabetes (De Silva et al., 2007). Being overweight or obese takes a toll on not only a child's physical wellbeing but also their psychological and social wellbeing (Witherspoon et al., 2013). Psychosocial factors such as loss of quality of life (De Silva et al., 2007), depression, anxiety, underachievement in young adulthood, poverty, and body dissatisfaction have also been associated with obesity (Huh et al., 2011; Merten et al., 2008; Witherspoon et al., 2013). Also, adolescents who are overweight or obese during childhood are more likely to suffer from obesity as adults (Simmonds et al., 2016; Sun Guo et al., 2002).

These findings are concerning because overweight/obese adults are more likely to suffer physical and/or mental health issues such as depression, or diseases like diabetes or cancer (Lumneg & Saltiel, 2011). Cardiovascular disease, an illness effecting the heart or blood vessels that leads to high blood pressure, heart attack, failure, arrythmia, or edema, is also common among overweight or obese individuals and is responsible for more deaths worldwide than any other illnesses (American Heart Association, 2018). In 2018, 47% of African American women had been cited to have some form of cardiovascular disease (American Heart Association, 2018). African American women have also been found to experience higher rates of high blood pressure and diabetes (Talleyrand, 2006).

Body Dissatisfaction

Body dissatisfaction is associated with an increased probability for the development of obesity, eating disorders, and depression (Kelly et al., 2005; Saunders & Frazier, 2016). Body dissatisfaction has many definitions. It can be defined as the difference in comparison between one's perceived body size and ideal body size or a negative appraisal of one's current body (Bucchianeri et al., 2016; Kroon Van Diest et al., 2014). In the U.S. body dissatisfaction predominantly affects women. Studies have found between 13 to 32% of the adult female population report body dissatisfaction with their bodies and is commonly observed among people who are larger (Fallon et al., 2014).

Body Dissatisfaction in African American Women & Girls

Previous research on body dissatisfaction in African American women has been inconsistent. Some studies claim they demonstrate higher levels of body satisfaction than other ethnicities and others claiming they hold similar levels (Epperson et al., 2013). For example, a metanalysis on body dissatisfaction in women in the U.S. found African American women report less body dissatisfaction than white women (Grabe & Hyde, 2006). On the other hand, Fitzgibbon and colleagues (2004) did not find any differences in body dissatisfaction across ethnicities in adult women.

Cotter and colleagues, (2015) examined body satisfaction, ethnic identity, disordered eating, BMI and validity of the body appreciation scale in college aged women. It was found that women with higher levels of body appreciation and ethnic identity tended to report less weight, dieting, and body size concerns as well as having less value for the thin beauty ideal (Cotter et al., 2015). Furthermore, African American women with higher levels of body appreciation, also

tended to have higher self-esteem and body satisfaction. BMI was also found to be related to African American women's level of body satisfaction and weight concern (Cotter et al., 2015). It should be noted only 19% of this studies sample consisted of African American women, despite the small sample size these results led researchers to theorize that body appreciation and ethnic identity potentially act as protective factors against body image, weight, and diet concerns among African American women. (Cotter et al., 2015). Cotter and colleagues (2015) maintain future research should investigate cultural and racial factors as well as taking into account one's development and environment to examine how this may affect ones ethnic identity and body appreciation.

Researchers concluded, although there have been more cases where African American women and girls have been found with higher body satisfaction in reference to other races or ethnicities, this evidence is not sufficient or consistent enough to conclude that women and girls within this population do not struggle with their body image or have weight concerns (Cotter et al., 2015). Therefore, plausible explanations for the inconsistencies in previous research can be attributed to the chronic use of cross ethnic analysis, the small amount of research with truly representative samples of this understudied population, as well as the potential cultural and environmental influences that can elicit or protect against body dissatisfaction.

These discrepancies are also found in previous studies on African American girl's body dissatisfaction. For example, a cross-sectional study assessing body image discrepancy in middle school aged girls, found African American girls were more satisfied with their body (Robbins et al., 2017). Consistent with these findings, a study examining body dissatisfaction in middle and high school students found ethnic differences in body dissatisfaction, where African American girls expressed the least body dissatisfaction (Bucchianeri et al., 2016). However, Robinson and

colleagues' (2000) study on third graders, weight concern and body satisfaction, found that African American girls of higher socioeconomic status (SES) demonstrated the most dissatisfaction, although this difference was not found to be statistically significant across ethnicities (Robinson et al., 2002). This could be explained by the fact that only five percent of participants were African American. Another interesting finding in this study was among African American girls, those of higher socioeconomic status (SES) had more body dissatisfaction than African American girls of lower SES. Despite the lack of a representative sample of African American participants and lack of statistically significant findings for differences in dissatisfaction within Robinson and colleagues (2002) study, their research speaks to potential factors that can account for differences in body dissatisfaction.

Similarly, a study examining 9-13-year-old girls' body dissatisfaction did not find any differences across ethnicities (Saunders et al., 2016). In Stockton et al., (2009), 8-10-year-old African American girls BMI and level of body satisfaction were examined using a silhouette measure. Their results indicate the larger an adolescent girl's discrepancy between her perceived current body size and ideal body size, the more likely they are to express doubt in their ability to participate in physical activity and have higher levels of weight concern and dieting behavior (Stockton et al., 2009). Furthermore, girls of higher weight status were also four times more likely to engage in dieting (Stockton et al., 2009). Researchers synthesized, body dissatisfaction maybe impacting African American adolescent girls at a younger age, potentially leaving girls of higher weight status susceptible to engaging in dieting behavior during prepubescence (Stockton et al., 2009). These findings reveal how one's perception of their current body size, weight status, and ideal body size each play a role in not only body satisfaction but also dieting behavior and one's belief in their self-efficacy for physical activity.

Body Perception

Accurate appraisal of one's body size has been found to predict healthier weight control practices among African adolescents in Alwan et al., (2011). It was also found that underestimation of one's body size increased likelihood for adolescents to make inappropriate attempts to gain weight than those who were accurate (Alwan et al., 2011). In this study a large sample (N = 1,432) of students in Seychelles, age 11-17, were measured for BMI and surveyed for body satisfaction, body ideals, weight loss attempts, and weight perception, using an 8-point-silhouette measure and a narrative description for current body size (e.g.: underweight, right weight, overweight). It was also found that BMI did not have a strong influence on body ideals, except children with a BMI in the obese range did tend to have larger ideals (Alwan et al., 2011). The girl's estimations on the silhouette measure of this study showed 61% of girls in the normal weight group inaccurately identified their current body size (37% underestimated, 24% overestimated) and 24% of girls in the overweight group (all BMI ≥ 85), underestimated their current body size (Alwan et al., 2011). Because weight categories were dichotomized, normal weight vs. overweight, combining those of overweight or larger weight status into the same group, it is unclear if these findings apply more for those of which either overweight, obese, or severely obese weight status.

Despite this, another interesting finding from this study in Seychelles adolescent girls was 37% of girls in the normal weight group underestimated their current body size on the visual measure (identifying themselves as thin), but 72% of them accurately identified themselves as being normal weight on the on the narrative measure and only 13% of normal weight girls described themselves verbally as being underweight (Alwan et al., 2011). This speaks to the need

to further investigate the overall concept of accuracy and body perception and how variations of measures influence such findings.

Wang, Liang, and Chen's (2009), obesity intervention trial examined perceived body size accuracy in low-income middle schools in Chicago. This was assessed in a primarily African American sample. Researchers measured body perception verbally, by having participants choose one of three written categories they felt described their current body size (e.g: underweight, normal weight, overweight or obese), which was then compared to their BMI. Of the 88 girls in the normal weight group, 75.3% of them accurately identified their current body size. Of the 101 girls in the overweight group, 69.2% of them accurately identified their current body size. Of the 35 girls in the obese group, 80.2% of them accurately identified their current body size. Of those who were inaccurate the majority underestimated their current body size across all weight groups.

In Saxton et al., (2009) a school-based sample of seven to nine year-olds in Northern London examined children's accuracy in identifying their current body size relative to BMI. This study used both visual and verbal measures for perception of body size. A moderate correlation was found between perceived body size and BMI for both the visual (r=.43) and verbal (r=.41) measures for perception, indicating larger children tended to choose larger figures (Saxton et al., 2009). However, overall children still tended to underestimate their body size. On the visual measure, 45% of children underestimated their current body size and underestimation was more pronounced among those of larger weight status. In addition to this, it was found that girls were more accurate than boys at a lower BMI, but less if they had a higher BMI. As for the verbal measure, children also underestimated their body size. The vast majority claimed to have a healthy body size across all levels of BMI (Saxton et al., 2009). Agreement between the two

measures for overweight and obese children's accuracy showed that 92% of them underestimated their body on the visual measure and 57% on the verbal. However, researchers did not conclude one more efficacious over the other due to biases in participants responses used in the verbal measure.

Chaimovitz and colleagues (2008) examined a small sample ($N = 91$) of Canadian pediatric patients, age 5-18, in order to examine physician, parental, and child accuracy in both visual and verbal measures for the child's body size and weight status. There was an even distribution of participants for each weight category. It was found that parents and children had similar reports for their child's current body size and weight status. Overall parents tended to underestimate their child's body size but parents were more accurate on the verbal measure. Both children and parents were more likely to underestimate on the visual measure.

It should be noted that the visual measure did not use an image of a human being to represent the figures on their scale, rather a stick figure varying in girth was used (Chaimovitz et al., 2008). Also, because there were only five silhouettes used, there was less variability in the visual representations of a child's body size for parents to compare their child's body size to. The same figure was used in Saxton et al., (2009) and faced the same limitation. It has been cited in adult African and African American populations, that visual measures with detailed and culturally adapted silhouettes, such as Pulvers Silhouettes, have been found highly reliable and have valid psychometrics because the imagery is more relatable and diverse with the use of 9 silhouettes, alleviating both measurement issues (Pulvers et al, 2004; Yepes et al., 2015).

Strauss, (1999) found that perceived body size was associated with weight loss attempts, regardless of racial group. In this study, data from the National Health and Nutrition

Examination Survey III (NHANES) was used to examine families in the U.S., but adolescents were the primary interest (Strauss, 1999). Data for their BMI, body perception, satisfaction and desire to lose weight was used in the analysis. The sample consisted of 743 African Americans and 1097 Anglo Americans, with an age range of 12-16 years old. Female participants inaccurately reported their current body size, considerably more often than boys. Anglo American girls demonstrated the most over estimation overall (Strauss, 1999). Differences in desire to lose weight between females was only found between normal weight girls, specifically, 51% Anglo American girls and 24% African American girls. These differences were not found between girls who were overweight or obese, where 90-97% of them demonstrated the same level of desire to lose weight (Strauss, 1999). Among girls who wanted to be larger, 17% of them were African American and only 7% of them were Anglo American. Strauss also suggested that racial differences in body ideals can play a role in differences in body ideals and perception.

Overall, previous research on body perception is also relatively inconsistent in regard to accuracy of measures and identification. Although it is unclear what specific factors can be attributed to this disparity, what remains most consistent however is the tendency toward underestimation and the connection between perception and weight loss.

Body Ideals

A factor that can account for differences in body dissatisfaction in African American women is cultural body ideals and norms, which have been found to play a large role in body satisfaction and are shaped and established by ones culture, family and friends views on such matters (Kelly et al., 2004). Previous studies have found that ethnic identity can act as a protective factor associated with healthier body images and satisfaction among African

American women (Cotter et al., 2015). It is theorized that higher body size satisfaction in African American women is a result of culture and larger body ideals (Allan et al., 1994; Parker et al.,1995). In support of this, previous research has predominantly found African American women have larger body ideals, are more likely reject the thin ideal, and are less likely to view themselves as overweight (Cotter et al., 2015; Webb et al., 2013).

Previous research on African American girl's body ideals are conflicting. Barroso and colleagues (2010) found African American adolescents considered larger frames to be more attractive. Chen and Wang (2011) found African American adolescents ideal body size reflect a person of normal weight, but also found overweight and obese girls identified a larger ideal body size than girls of lower weight status. Furthermore, a study on fifth graders weight loss attempts found an association between having a larger body size and wanting to be smaller across all ethnicities in the study. However, no association or mediating effect between body size, body perception, and attempts to lose weight were found for African American girls, but this effect was found for White and Latino participants (Epperson et al., 2013). It is unclear as to why this effect was not observed in African American participants (Epperson et al., 2013). This could possibly be attributed to a cultural influence and beauty ideals that was not controlled for within this study.

Differences in African American and Anglo-American girl's ideas about beauty or the ideal woman is demonstrated in Parker and colleagues, (1995) study investigating beauty ideals. Girls participating in the study were asked to describe the perfect woman (Parker et al., 1995). African American girls defined the perfect woman in terms of personality traits, style, and overall ability. Conversely, Anglo-American girls described the perfect woman solely in terms of her appearance (Parker et al., 1995). Although insightful Parker et al. (1995) findings were based

on a relatively small sample of African American girls and were assessed through unstructured interview. However, these findings are still compelling, because it brings to light how culture can explain the differences in how girls define themselves and what makes them feel beautiful, or satisfied with their body. Having this knowledge can help create better body image prevention and intervention as well as improving our understanding of what components of beauty play a role in body satisfaction.

Mothers & Daughters

Dieting behaviors modeled by caregivers has been shown to influence a child's value of thinness (Golan et al., 2004), parents also play a key role in their child's body image (Kelly et al., 2004). In Thompson and colleagues, (1999) African American girl's reported perceived body size were significantly associated with their mother's rating, but no association was found between mothers and daughters rating for adolescent ideal body size (Thompson et al., 1999). African American adolescent females were also found to have higher body size satisfaction and less weight concern. And BMI was positively associated with body dissatisfaction in females in this sample overall (Thompson et al., 1999). No significant associations were found between mother's dissatisfaction and daughter's dissatisfaction (Thompson et al., 1999).

Mother and daughter BMI and body dissatisfaction were significantly associated with one another (Keery et al., 2006). In addition, daughter's perception of their mothers dieting was predictive of their daughter's weight concerns and increased the probability of their daughter engaging in dieting behavior (Keery et al., 2006). Strauss (1999) also found that adolescents were more likely to perceived themselves as overweight if their mother were of a lower BMI, than those with mothers of normal or overweight status.

A study on South African girls and their mothers body ideals and dissatisfaction found black mothers and daughters identified a larger normal silhouette than mothers and daughters of white or mixed race (Moiza et al., 2005, 2011). In addition to this, black mothers identified larger silhouettes as being "fat" than white mothers, however these differences were not significant between silhouettes girls identified as being "fat" (Moiza et al., 2011). In other words, adolescents identified similar silhouettes to represent a "fat" person but mothers differed much more from each other on this. In addition, black mothers and daughters were both less likely to view themselves as overweight and had less dissatisfaction (Moiza et al., 2005, 2011). They were also less likely to associate overweight women as unhappy (Moiza et al., 2005). These findings speak to the significant role parents play in shaping their child's weight concern, eating behaviors, and attitudes toward body size and level of satisfaction.

Eating Disorders

Overall eating disorders such as Anorexia, Bulimia, and Binge Eating Disorders are not very common or widespread in the United States. Nevertheless, they are still of great importance and concern because of their negative health outcomes and comorbidities with many psychological disorders (Hudson et al., 2007). A eating disorder is defined as consistent afflicted eating behavior that leads to a change in the way one absorbs or consumes food, which causes substantial harm to one's health or psychosocial functioning (American Psychiatric Association, 2016). Anorexia Nervosa is a very serious and potentially fatal eating disorder which is marked by extremely low weight status (BMI ≤ 18 to < 15), that occurs as result of an individual's refusal to eat or eats very little in order to prevent weight gain or fear it despite their small size (American Psychiatric Association, 2016). People with this disorder tend to give an inappropriate importance to weight and its relation to their self-worth, as well as having an inaccurate

perception of their body size, and/or dismiss the severity of the consequences of their eating behavior (American Psychiatric Association, 2016). This disorder usually develops in adolescent or young adult females and is more likely to occur in countries like the U.S. that value thinness. The prevalence of Anorexia in African American females is considered to be fairly low (American Psychiatric Association, 2016). Similarly, a national survey of African and Caribbean Americans in the U.S. found no prevalence of Anorexia in both adult and adolescent females (Taylor et al., 2007).

Bulimia Nervosa is an eating disorder that is typically found in normal weight females (American Psychiatric Association, 2016). Those suffering from this disorder engage in repetitive bingeing and purging in order to prevent weight gain (American Psychiatric Association, 2016). A binge episode is when an individual consumes an excessive amount of food within a short period of time, where an individual with bulimia would typically restrict their calorie intake and/or engage in purging behaviors. This can involve anything from vomiting, laxative use, refusing to eat, or extreme exercise in order to off-set weight gain (American Psychiatric Association, 2016). These individuals also give an inappropriate importance to weight and its relation to their self-worth and have an inaccurate perception of their body size (American Psychiatric Association, 2016). This disorder is typically non-life threatening; it commonly results in malnutrition and emotional distress due to guilt or disappointment with themself after a binge and/or feeling they cannot stop the cycle. Although, excessive purging like laxative use or vomiting behaviors can result in serious harm to gastrointestinal organs and in rare cases lead to death (American Psychiatric Association, 2016). Bulimia typically effects ethnicities equally in the United States and is estimated to effect close to two percent of females over 12 months (American Psychiatric Association, 2016). This is also supported in Taylor et al.,

(2007) which found bulimia affected 1.9% of adult African or Caribbean American women across their lifetime and 1.1% over a 12-month period. In adolescents only .43% of African or Caribbean American girls were affected by Bulimia over 12-months (Taylor et al., 2007).

Binge Eating Disorder is similar to Bulimia, but individuals diagnosed with this disorder do not engage in purging behaviors like those with Bulimia do (American Psychiatric Association, 2016). Individuals with Binge Eating Disorder engage in frequent uncontrollable bingeing episodes and are typically overweight or obese, which usually manifest during attempts to lose weight (American Psychiatric Association, 2016). The negative health consequences associated with this disorder are usually a result of obesity. In addition to this, people suffering from this also experience emotional distress or guilt after binges, like those with Bulimia, however those with Binge Eating Disorder do not engage in compensatory behaviors, such as extreme calorie restriction (American Psychiatric Association, 2016).

This disorder tends to affect both genders equally and is estimated to affect about 1.6% to 1.8% of people over a 12-month period and is more common among minorities in the United States (American Psychiatric Association, 2016). Binge Eating Disorder was identified as the most prevalent eating disturbance in African and Caribbean Americans (Taylor et al., 2007). Approximately 2.36% of African and Caribbean American women struggled with this disorder across their life span and 1.1% suffered from this over the course of 12 months (Taylor et al., 2007). Interestingly, many adult women in this study were also found to have engaged in binging behaviors, 5.82% over their life span and 2.62% over the course of a year. In African and Caribbean American adolescent females .57% had Binge Eating Disorder and 1.47% engaged in binging behavior (Taylor et al., 2007). These proportions demonstrate how engaging in binging behavior during adolescence, can potentially explain the elevated rates of Bulimia and Binge

Eating disorder among African and Caribbean American women. Additionally, researchers in Napolitano and Himes (2011) suggest cultural factors can potentially explain the differences in their findings for what triggers a binging episode among college aged females. Factors such as affect, body dissatisfaction, and desire to become thinner were found to contribute to a binging episode in African American college women (Napolitano & Himes, 2011). While for Caucasian American women, affect, mental restraint, desire to become thinner, and BMI acted as influential factors for binging (Napolitano & Himes, 2011). These results indicate more needs to be done to investigate what factors account for these differences and if these also apply to young adolescent girls.

Summary of Previous Literature

American society has seen exponential growth in the rates of overweight and obese adolescents (Witherspoon et al., 2013). This epidemic is prevalent across all races/ethnicities, however the highest level of risk is found among minorities, with African Americans as the most susceptible population (Huh et al., 2017, 2020). In addition, African American women are at a higher risk for obesity than African American men (Huh et al., 2017, 2020). These rates also tend to hold true for African American adolescents and children, with girls having one of the highest levels of incidence, exceeding African American boys and girls of ethnicities (Hales et al., 2017). It is not entirely clear why these disparities exist across ethnicities. It is also unclear as to why anorexia seems absent within this population, yet bulimia is found equally across ethnicities, and binge eating is the most commonly found eating disorder among members of this population (American Psychiatric Association, 2016; Taylor et al., 2007). The central component of both these ailments is body dissatisfaction, and still, this alone has not explained the discrepancies, also due to the inconsistent and contradictory findings of previous research relative to this

population (Cotter et al., 2015). Factors such as a lack of body dissatisfaction, inaccurate body perceptions (Chen & Wang, 2011), SES (Robinson et al., 2002), and cultural ideals and beauty standards (Parker et al., 1995) have been theorized as potential explanations for the severity of obesity in this population. Regarding eating pathology, some studies have proposed SES, culture, and maternal influence on a child's eating habits and attitudes toward her body size as potential explanations for the disparity in eating pathology (Moiza et al., 2011;2005). Very few studies have investigated these relations in this population. Although these explanations are plausible the chronic inconsistencies among research that has investigated these proposed explanations, indicate there is more to be understood about body image in this population that has yet to be uncovered.

Gaps in Previous Literature

There are a number of limitations in previous research regarding African Americans body satisfaction, weight status, and eating disorder symptoms that the current study aims to address. These limitations have created a distorted and equivocal understanding of how these phenomena are shaped or relate and/or coexist within this population. First, many research studies examine African Americans in comparison to other ethnicities (Cotter et al., 2015) and they typically have small samples of African Americans. In addition to this, the majority of previous research investigating these constructs have been based on university samples or on adult women. Very few have examined middle school age adolescent African American females. A homogeneous sample such as this one, is highly beneficial because these results will be free of the distortion created by ethnic comparison and can be inferred from with more confidence because of this large representative sample. Second, previous research findings for both African American women and adolescent girls are highly inconsistent in terms of body dissatisfaction, eating

disorder symptoms, and the explanatory factors that actually account for the differences within this population. Third, previous research has clustered obese and overweight adolescents into the same categories, ultimately misrepresenting the progressive stages of weight status (Witherspoon et al., 2013). Finally, little to no studies have examined African American mothers and daughters body dissatisfaction, body perception, and eating disorders in the United States. All together each of these limitations will be addressed in this study. Investigating body dissatisfaction, obesity, and eating pathology in adolescent African American girls and their mothers is a vital step toward furthering our understanding of what shapes body dissatisfaction. As well as bridging the gaps in previous literature. This would also further our understanding of the role dissatisfaction plays in both obesity and eating pathology. Examining this can potentially lead to the improvement of health interventions, prevention, and reduction of body dissatisfaction, obesity, and eating pathology.

Hypotheses

Aim 1. Investigate levels of body satisfaction and BMI in adolescent girls.

Hypothesis 1. BMI is predictive of body size satisfaction in adolescent girls.

Hypothesis 1a. There will be a relation between adolescent BMI and body dissatisfaction, specifically those with a lower BMI will demonstrate less dissatisfaction and those with a higher BMI will demonstrate more dissatisfaction.

Aim 2. Investigate accuracy in reported current body size of African American adolescent girls and mothers.

Hypothesis 2. Reported current body size will be mostly inaccurate, adolescent girls will be more likely to inaccurately report having a smaller body size than their actual body size based on BMI.

Hypothesis 2a. Mothers will be more likely to inaccurately report their child's body size and will tend to under-report their daughters body size based on BMI.

***Hypothesis 2b*.** There will be a relation between child self-report and mother's report of her child's current body size.

***Hypothesis 2c*.** Adolescent accuracy for current body size will moderate the relationship between BMI and eating pathology symptoms, such that adolescents who accurately perceive their body have healthier eating attitudes.

Aim 3. Investigating body ideals in African American adolescent girls and their mothers

Hypothesis 3. The average ideal body size for mothers and daughters will be similar and reflect a body size that is in the higher normal range.

Aim 4. Investigating mothers body satisfaction and the relation between daughter body satisfaction.

Hypothesis 4. There is a relationship between mother and daughter body satisfaction.

Hypothesis 4a. Mothers' level of satisfaction with daughters' body size will moderate the relations between daughters' BMI and body satisfaction.

Aim 5. Investigating eating disorder symptomology in African American adolescent girls and their mothers.

Hypothesis 5. There will be a positive association between African American adolescent girls BMI and dieting behavior, as BMI increases eating pathology symptoms also increases.

Hypothesis 5a. There is an association between mothers scores on the eating attitudes test and daughters scores on the children's eating attitudes test.

Aim 6. Investigating Body Dissatisfaction, BMI, and Eating Disorder Symptomology

Hypothesis 6. BMI will moderate the relation between adolescent dissatisfaction, wanting to be smaller and eating disorder symptomology.

Method

Participants

Data collected from 516 adolescent African American girls and 288 of their mothers in the present study, were originally apart of larger a randomized controlled trial (RCT) school-based health intervention program known as Challenge. Twenty-two public schools were selected from primarily in low-income urban communities in the Baltimore area. Participants eligible for recruitment in the original experiment were, any healthy adolescents attending these schools were permitted to participate. Caregivers were encouraged but not required for adolescent enrollment. Weight or weight loss was not referred to during recruitment or known to participants.

In the present study, only female African American adolescent and caregivers who identified themselves as the child's mother were included. Adolescents Age ranges of those includes in this study were between ten to fourteen years old with an average of 11.67 years old, who were primarily in sixth or seventh grade (see Table 1). The average age for mothers in this study was approximately 37.16 years old, ranging from about twenty-five to sixty-four (see Table 2.).

Procedure

The University of Maryland School of Medicine Institutional Review Board approved of the following method. Once written consent was provided by both mothers and daughters, adolescents were then randomized into treatment groups prior to baseline assessment, during April 2001-May 2004. Adolescent BMI was assessed anthropometrically and caregivers provided their heigh and weight via self-report. Demographics and body satisfaction was

assessed via self-report surveys. Surveys were taken on a computer with headphones, each question was read aloud and displayed on screen. Participants were compensated for their travel and their time once this was completed.

Measures

Demographics

Demographic surveys assessed age, gender, race, and highest level of education of both mothers and daughters. Only mothers were asked to report their family income and family health history (see Appendix E).

Anthropometry

Qualified staff allocated BMI for adolescent girls. Height was assessed via the stadiometer and centimeters as the unit of measurement. Weight was assessed on a scale and measured in kilograms. Adolescent BMI was based on CDC (2002) age and gender growth charts then standardized and categorized by percentile. BMI < 5^{th} percentile was considered underweight, BMI ≥ 5^{th} percentile or < 85% percentile was considered normal weight, BMI ≥ 85^{th} percentile or < 95^{th} percentile was considered overweight, BMI ≥ 95^{th} percentile was considered obese, and BMI ≥ 99^{th} percentile was considered severely obese.

Mother's weight and height were assessed vias self-report and calculated into BMI scores and categorized. Those with a BMI < 18.5 were considered underweight, BMI ≥ 18.5 or < 25 were considered normal weight, BMI ≥ 25 or < 30 were considered overweight, BMI ≥ 30 or < 40 were considered obese, BMI ≥ 40 were considered severely obese. Those in the underweight category, for both adolescent and mother categories, were excluded from the present study, because there was an insufficient number of participants in this group for analysis.

Adolescent Body Size Satisfaction

A culturally adapted, age and gender specific, 9-point-silhouette scale (smallest =1 largest = 9), was the primary measure for adolescent body satisfaction (Mitola et al., 2007; Stunkard et al., 1983). Silhouettes are a highly reliable and are associated with BMI in African samples (Pulvers et al, 2004; Yepes et al., 2015). The Adolescent girls were asked to identify two separate silhouettes (see Appendix A); one that represented which body size looked most like them (perceived current body size) and another that represented the body size they wanted to look like (ideal body size) (Mitola et al., 2007). One's level of body satisfaction was determined by the discrepancy between their perceived current body size and ideal body size. If there was a difference of zero to one between participants selected perceived current body size silhouette and ideal body size silhouette, then they were categorized as having body satisfaction, wanting to remain the same. Those with a difference of two up to a six-point difference between their perceived current body size silhouette and ideal body size silhouette were categorized as dissatisfied. In addition, those who were considered dissatisfied were subdivided into two categories, those who identified an ideal body size silhouette that was larger than their perceived current body size silhouette were categorized as being dissatisfied wanting to be larger and those who indicated an ideal that was smaller than their perceived current body size were categorized as being dissatisfied, wanting to be smaller.

Mother Body Size Satisfaction

Mothers were also given a culturally adapted, age and gender specific, 9-point-silhouette scale (smallest =1 largest = 9), to measure their satisfaction with their adolescent's body size (Mitola et al., 2007; Stunkard et al., 1983). Mother's satisfaction with their child's body size required them to identify two silhouettes each on a separate silhouette scale (see Appendix B);

one that best resembled their daughter's body current body size (mother's perception of daughter's current body size) and another that represented the body size they would like for their child to look like (mother's ideal body size for her daughter). Satisfaction was determined by the same criteria for categorization as adolescent level of satisfaction. If there was a difference of zero to one between the reported perceived current body size silhouette and ideal body size silhouette, they were categorized as being satisfied, wanting their daughter to remain the same body size. Those with a difference of two to six-points between the selected perceived current body size silhouette and ideal body size silhouette, were categorized as being dissatisfied with their daughter's body size. Mothers who were dissatisfied with their daughters body size were then subdivided into two categories; those who identified an ideal that was larger than their perceived current body size were categorized as being dissatisfied wanting their daughter to be larger and those who indicated an ideal that was smaller than their perceived current body size was categorized as being dissatisfied, wanting their daughter to be smaller.

Eating Disorders

Questions for the anorexia and bulimia subscales from the 26 item Children's Eating Attitudes Test (ChEAT) was used to assess eating disorder symptomology associated with anorexia and bulimia in our sample (Maloney, McGuire, & Daniels, 1988; Smolak & Levine 1993). This measure uses 6-point-scale items to measure severity of symptoms (e.g.1 always to 6 never) (Smolak & Levine 1993). A cut off score of 20 or higher is considered indicative of potential eating pathology or disturbance (Garner et al., 1982; Smolak & Levine 1993). A total of 15 questions were used from the original 26 ChEAT items ($\propto = .789$), (see Appendix C for questionnaire). This measure has proven reliable in both this population and age cohort (DeLeel et al., 2009; Vander Wal & Thomas, 2004). The constructs assessed on this scale involved

dieting, food constraint and purging, and oral control (Smolak & Levine 1993). The following are examples of questions for each subscale: dieting subscale; I am aware of calorie content and I have been dieting, constraint and purging; “I feel guilty after eating” and “I stay away from eating”, oral control; “people want me to eat more” and “people think I am too thin” (Smolak & Levine 1993).

Mothers were given the 26-item Eating Attitudes Test (EAT-26) questionnaire (see Appendix D), which is a common measure for eating disorder symptomology in adults (Smolak & Levine 1993). This measure also uses 6-point-scale items to measure severity of symptoms (e.g.1 always to 6 never) (Smolak & Levine 1993). A cut off score of 20 or higher is considered indicative of potential eating pathology or disturbance (Garner et al., 1982; Smolak & Levine 1993). The subscales on this measure are highly associated with Anorexia and Bulimia. However, the reliability in the current sample was low ($\propto$ = .490). The three components assessed within this measure are food pre-occupation (e.g. I am aware of calorie content and I have been dieting), oral control (e.g. “I eat diet foods), and dieting behavior (e.g. “I display self-control around food”).

Data Analysis Plan

Responses for Body Satisfaction Silhouettes (mother and daughter reports), Eating Attitudes, and demographic questionnaires (assessing mothers age, race/ethnicity, family health history, highest level of education, hours worked per week, household income, size, and dependents) was entered into SPSS (version 25) for analysis. In addition to this, scores for both child and adult Eating Attitudes Questionnaires were calculated according to standard cut off and scoring guidelines. Adolescent Body Mass Index (BMI) was computed into BMI percentiles based on CDC growth charts.

Preliminary Analysis. Descriptive Statistics were run for BMI, Body Satisfaction, Eating Attitudes, and SES to gain more insight on the data sample.

Aim 1. Investigate Body Satisfaction and BMI in Adolescent Girls

Hypothesis 1. A Logistic Regression was run to test the hypothesis; BMI is predictive of body satisfaction in African American adolescent girls.

Hypothesis 1a. A Chi Square analysis was run to test the hypothesis, there will be a relation between adolescent BMI and body dissatisfaction, specifically those with a lower BMI will demonstrate less dissatisfaction and those with a higher BMI will demonstrate more dissatisfaction.

Aim 2. Investigate Accuracy in Reported Current Body Size of African American Adolescent Girls

Hypothesis 2. A Chi Square analysis was run to test the hypothesis, adolescent girls reported current body size will be mostly inaccurate, with a tendency to underestimate.

Hypothesis 2a. A Chi Square analysis was run to test the hypothesis, mothers will be more likely to inaccurately report their daughters body size to be smaller than their actual body size based on BMI.

Hypothesis 2b. A Chi Square analysis was run to test the hypothesis, there is a relation between child self-report and mother's report of their child's current body size.

Hypothesis 2c. A moderation analysis was run to test the hypothesis, adolescent accuracy for current body size will moderate the relation between BMI and eating pathology symptoms, where adolescents who have an accurate perception of their current body size will have healthier eating attitudes.

Aim 3. Investigating Body Ideals in African American Mothers and Daughters

Hypothesis 3. An Independent Samples T-test was run to test the hypothesis, the average ideal body size for mothers and daughters will be similar and reflect a body size that is in the higher normal range.

Aim 4. Investigating Mother's Level of Satisfaction with Daughter's Body and the Relation Between Daughter Body Satisfaction

Hypothesis 4. A Chi Square analysis was run to test the hypothesis, there is a relation between mother and daughter body satisfaction.

Hypothesis 4a. A Moderation analysis was run to test the model of moderation hypothesis, mother's satisfaction with daughter's body size will moderate the relation between daughter's BMI and body satisfaction.

***Aim 5. Investigating Eating Disorder Symptoms in African American Adolescent Girls and Mothers*.**

Hypothesis 5. A Pearson's Correlation analysis was run to test the hypothesis, there will be a positive association between adolescent girls BMI and dieting behavior, as BMI increases eating pathology symptoms increases.

Hypothesis 5a. A Pearson's Correlation analysis was run to test the hypothesis, there is a linear association between mother's scores on the eating attitudes test and daughters scores on the children's eating attitudes subscales.

Aim 6. Investigating Body Dissatisfaction, BMI, and Eating Disorder Symptoms

Hypothesis 6. A moderation analysis was run to test the hypothesis, BMI will moderate the relationship between those who are dissatisfied, wanting to be smaller and eating disorder symptomology.

Results

Preliminary Analysis

A sample of 516 healthy middle school aged African American girls took part in the current study. The average age was 11.67 ranging from 10 to 14 years old with girls primarily in 6th or 7th grade. The proportion of girls within each BMI category was as follows; 47.8% normal weight (BMI ≥ 5% and < 85%), 19.2% overweight (BMI ≥ 85% and < 95%), 22.5% obese (BMI ≥ 95% and < 99%), and 10.3% severely obese (BMI ≥ 99%) (See Table 1.) Of the 516 adolescent girls only 288 of their mothers took part in the present study. The average age for mothers was approximately 37.16 years old, ranging from about 25 to 64. Mother's reported work hours averaged at about 36 hours per week and 45% of mothers also reported living below the poverty line. Mother's BMI was assesses via self-reported for height and weight. The proportion of mothers within each weight status is as follows: 18.4% normal weight (BMI ≥ 18.5 or < 25), 30.9% overweight (BMI ≥ 25 or < 30), 37.9% obese (BMI ≥ 30 or < 40), and 12.9% severely obese (BMI ≥ 40) (see Table 2.).

Regardless of weight status 49.1% percent of adolescents were satisfied with their current body size, wanting to remain the same. Of those who were dissatisfied, 43.2% wanted to be smaller and only 7.7% wanting to be larger (see Figure. 1). The level of satisfaction by weight category was the following for normal weight adolescents, 70.4% were satisfied wanting to remain the same, 15.9% were dissatisfied wanting to be smaller, and 13.7% were dissatisfied wanting to be larger (see Figure. 2). Among overweight adolescents, 51.5% were satisfied wanting to remain the same, 46.4% were dissatisfied wanting to be smaller, and 2.7% were dissatisfied wanting to be larger (see Figure. 3). Among obese adolescents, 20% were satisfied wanting to remain the same, 79.1% were dissatisfied wanting to be smaller, and .9% were

dissatisfied wanting to be larger (see Figure. 4). Among severely obese adolescents, 8.3% were satisfied wanting to remain the same, 89.6% were dissatisfied wanting to be smaller, and 2.1% were dissatisfied wanting to be larger (see Figure. 5). These proportions demonstrate a much higher level of dissatisfaction, specifically wanting to be smaller which also seems to increase drastically as weight status increases.

Adolescent girl's eating pathology symptoms on the ChEAT were assessed by using their scores on both the Anorexia subscale and Bulimia subscale. Adolescent average score on the Anorexia subscale were the following for each weight category; 3.79 normal weight, 6.14 overweight, 8.17 obese, 8.82 severely obese. Average scores on the Bulimia subscales were much lower overall, with an average of .91 for those in the normal weight category, 1.70 for those in the overweight category, 2.3 for those in the obese category, 2.65 for those in the severely obese category. Overall adolescents scores on both scales are not indicative of potential eating pathology, because they were all very far from the cut off of 20. However, it can be observed that there is much less incidence of bulimic symptoms among adolescent girls than anorexia. See Table 3. for sample sizes, standard deviations, min and max scores for each category and subscale. Averages for the ChEAT composite score was not used because not all 26 items of the questionnaire were given to the adolescents in this study.

Mother's eating pathology was assessed using their scores on the EAT-26 subscales for Anorexia and Bulimia. The average score for each weight category on the Anorexia subscale was: 2.87 for normal weight mothers, 4.33 for overweight mothers, 4.51 for obese mothers, and 5.43 for severely obese mothers. The average score for each weight category on the Bulimia subscale was: .15 for normal weight mothers, .23 for overweight mothers, .14 for obese mothers, and .26 for severely obese mothers. Overall scores were also very low among mothers and did

not indicate potential eating pathology. In addition, it was observed that there is a general similarity in the frequency of anorexia and bulimia for mothers and daughters. See Table 4. for sample sizes, standard deviations, min and max scores for each category and subscale.

Aim 1. Investigate Body Satisfaction and BMI in Adolescent Girls

Hypothesis 1. A logistic regression was run to test the prediction, BMI is predictive of body satisfaction in adolescent girls. This analysis found that BMI ($\beta = .05$, $p < .001$) is predictive of body satisfaction, $r = .642$, $F\ (1, 489) = 342.5$, $p < .001$. And accounts for 36.6% of variance in body satisfaction is explained by BMI.

Hypothesis 1a. A Chi Square analysis was run to test the hypothesis, there will be a relation between adolescent BMI and body dissatisfaction, specifically those with a lower BMI will demonstrate less dissatisfaction and those with a higher BMI will demonstrate more dissatisfaction. This analysis found a significant relation between BMI and body satisfaction, $\chi^2 (4) = 176.09$, $p < .001$. Adolescents with a lower BMI had the most satisfaction and those with a higher BMI tend to be more dissatisfied, wanting to be smaller. It should be noted, for this analysis the obese and severely obese categories were combined to even the distribution between sample sizes of each weight category. In terms of satisfaction 70.4% of normal weight adolescents, 51.5% of overweight adolescents, and 16.5% of obese and severely obese adolescents were satisfied with their body, wanting to remain the same body size. In terms of dissatisfaction, 82.3% of adolescents obese and severely obese category, 46.4% of overweight adolescents, 15.9% of normal weight adolescents were dissatisfied, wanting to be smaller (see Table 5.).

Aim 2. Investigate Accuracy in Reported Current Body Size of African American Adolescent Girls

Hypothesis 2. A Chi Square Analysis was conducted to test the hypothesis, adolescent girls reported current body size will be mostly inaccurate, with a tendency to underestimate. The results of this analysis found a significant relation between weight categories and reported current body size χ^2 (6) = 312.75, p <.001. The of proportion adolescent girls who underestimated their current body size across each weight category was high. 60.5% of girls in the normal weight category, 18.6% girls in the overweight category, 2.7% of girls in the obese category, and 4.2% of girls in the severely obese category chose a thin silhouette to represent their current body size. 67% of girls in the overweight category, 39.1% of girls in the obese category, and 2.1% of girls in the severely obese category chose a normal weight silhouette to represent their current body size (see Table. 6).

Hypothesis 2a. A Chi Square Analysis was conducted to test the hypothesis, mothers will be more likely to inaccurately report their child's body size and will tend to under-report their daughters body size based on BMI. The results of this analysis indicate a significant relation between mother's report of their daughter's current body size and BMI, χ^2 (6) = 229.232, p < .001. The hypothesis was supported, mothers did tend to underreport their daughters body size. Broken down by weight category, 84.8% of mothers with normal weight daughters identified them as thin. Next, 58% of mothers with daughters in the overweight group identified them as normal weight and 32% identified them as thin. Finally, 32.1% of mothers with daughters in the obese category identified them as normal and 3.6% identifying them as thin. None of the mothers with daughters in the severely obese group underestimated their daughters body size (see Table. 7).

Hypothesis 2b. A Chi Square Analysis was conducted to test the hypothesis, there is a is a relation between child self-report and mother's report of her child's current body size. This analysis found there is a significant relation between adolescent self-report and mother's report of her daughter's current body size, χ^2 (4) = 136.322, $p < .001$. Across each range of silhouettes selected, by both mother and daughter their responses frequently matched in their classification for adolescent's current body size. 85.9% of mothers who identified their daughters as thin also had daughters that identified themselves as thin. 38% of mothers who identified their daughters as normal also had daughters who identified themselves as normal. 72.3% of mothers who identified their daughters as overweight also had daughters that identified themselves as overweight. It was also found that the highest proportion of disagreement between mothers and daughters was between mothers who identified their daughters as thin, but their adolescent identified themselves as normal (see Table. 8.)

Hypothesis 2c. A moderation analysis was conducted to test the hypothesis, adolescent accuracy for current body size will moderate the relation between BMI and eating pathology symptoms, adolescents who accurately perceive their body have healthier eating attitudes (see Figure. 6). The initial analysis which assessed accuracy of all weight ranges together indicated reported body size had a significant moderating effect on BMI and ChEAT scores, F (3, 450) = 21.03, p <.001, R^2 = .123. With a significant interaction between BMI and reported body size, F (1, 450) = 9.18, p =.026. However, upon further analysis, it was found that no significant moderating effects were found when this effect was tested on each weight status individually. The following are results for interaction effects of each; normal, F (1, 213) = 1.22, p =.271, overweight F (1, 83) = 2.27, p = .143, obese and severely obese F (1,146) = .423, p =.517.

Therefore, it was concluded that the significant effect found in the initial analysis would be attributed to a type II error.

Aim 3. Investigating Body Ideals in African American Mothers and Daughters

Hypothesis 3. Paired samples *t*-test was run, to test the hypothesis the average ideal body size for mothers and daughters will be similar and reflect a body size that is in the higher normal range. No significant difference was found between mother (M = 1.46, *SD* = .515) and daughter (M =1.49, *SD* = .548) average ideal body size, t (243) = .689, p =.491. This partially supports the hypothesis. It was found that scores were not significantly different, indicating mothers and daughters average ideal body size is about the same, however, the average ideal body size of mothers and daughters was about a 2 which would reflect a silhouette in the thin range, and it was hypothesized that their ideal would be in the normal range.

Aim 4. Investigating Mother's Level of Satisfaction with Daughter's Body and the Relation Between Daughter Body Satisfaction

Hypothesis 4. A Chi Square analysis was run to test the hypothesis there is a relation between mother and daughter body satisfaction. The results of this analysis indicate there is a significant relation between mother and daughter body satisfaction, χ^2 (4) = 64.809, p <.001. Of the 241 responses given by mothers 174 (72.2%) of them of them expressed satisfaction, wanting their daughters to remain the same body size. And 62 (25.73%) mothers were dissatisfied wanting their daughters to be smaller and 5 (2.07%) wanted their daughter to be larger. These proportions were based on mother's total for each satisfaction category and calculated as a percentage of the total sample size. The proportions for mother and daughter reported level satisfaction showed 62.1% (n = 108) of mothers who were satisfied with their daughter's body

size, wanting them to remain the same, also had daughters who were satisfied. 28.7% (n = 50) of mother's who were satisfied with their daughter's current body size had daughters who were dissatisfied with their body, wanting to be smaller and 9.2% (n = 16) identified themselves as dissatisfied, wanting to be larger. 85.5% (n = 53) of mothers who were dissatisfied with their daughter's body size, wanting them to be smaller, also had daughters who were dissatisfied, wanting to be smaller. 28.7% (n = 50) of mothers who were satisfied with their daughter's current body size had daughters who were dissatisfied with their body wanting to be smaller. It should be noted very few mothers were the dissatisfied, wanting their daughter to be larger and it was decided it would not be feasible to infer and any sort of a relation from this group (see Table. 9). Overall, the high level of agreement between mothers and daughter's satisfaction levels indicates there is a relation between mother's satisfaction and her daughter's level of satisfaction.

Hypothesis 4a. A moderation analysis was conducted to test the hypothesis, mother's satisfaction with daughter's body size will moderate the relationship between daughter's BMI and body satisfaction (see Figure. 7). Results for this analysis show a significant moderation effect was found for those who were dissatisfied, wanting to be smaller, F (3, 99) = 102.26, p <.001, R^2 = .7560. BMI accounts for 75.6% of variance in adolescent dissatisfaction, b =.0375, t (103) = 7.81, p <.001. Mother's reported level satisfaction with her daughter's body size had a significant effect on adolescents who are dissatisfied and want to be smaller, b = -10.902, t (110) = -6.109, p < .001. As a mother's level of satisfaction with her daughter's body satisfaction increased one unit, daughter's dissatisfaction also decreases by -10.902. There was also a significant interaction between BMI and mother's reported satisfaction F (1, 99) = 43.00, p < .001. A significant moderation effect was also found among adolescents who were satisfied

group, F (3, 120) = 44.29, p <.001, R^2 = .5339. BMI accounts for 53.39% of variance in adolescents who are satisfied with their current body size and would like to remain the same, b = .0204, t (116) = 9.155, p <.001. Mother's reported level satisfaction with her daughter's body size had a significant effect on adolescents who are satisfied, b =-1.036, t (131) = -2.124, p =. 036. There was also a significant interaction between BMI and mother's reported satisfaction F(1, 116) = 10.62, p = .002. It should be noted that, only 9 mothers expressed dissatisfaction, wanting their daughter to be larger and as a result there was not enough data to successfully conduct this analysis for adolescents who were dissatisfied, wanting to be larger.

***Aim 5. Investigating Eating Disorder Symptoms in African American Adolescent Girls and Mothers*.**

Hypothesis 5. A Pearson's Correlation analysis was conducted to test the hypothesis, there will be a positive association between adolescent girls BMI and eating disorder symptomology, as BMI increases eating pathology symptoms increase. The Anorexia and Bulimia subscale on the ChEAT were used for this analysis. Results supported the hypothesis, a positive correlation, moderate in strength, was found between adolescent girls BMI (M = 77.17, SD = 24.27) and dieting behavior associated anorexia symptomology (M = 5.73, SD = 6.08), r (465) = .315, p < .001 (see Figure. 7). Results for the Bulimia subscale also supported this prediction, although the correlation is slightly weak, a positive correlation was found between adolescent girls BMI and restricting and purging components associated with symptoms of bulimia (M = 1.55, SD = 2.97), r (465) = .221, p < .001. Overall, the main take away is as girls weight status increased so did their likelihood to engage in restricting and/or purging behaviors (see Figure. 8).

Hypothesis 5a. A Pearson's Correlation analysis was conducted to test the hypothesis, there is a linear association between mother's scores on the eating attitudes test and daughters scores on the children's eating attitudes test. Results do not support this claim. No association between mothers' scores on the EAT-26 questionnaire (M = 5.99, SD = 4.65) and daughters' scores on the Anorexia (M = 5.98, SD = 6.12) subscale, r (254) = -.023, p = .710, or Bulimia (M = 1.45, SD = 2.91) subscale, r (254) = .053, p = .395, was found.

Aim 6. Investigating Body Dissatisfaction, BMI, and Eating Disorder Symptoms

Hypothesis 6. BMI will moderate the relation between those who are dissatisfied, wanting to be smaller and eating disorder symptomology (See Figure. 9). The hypothesis was not supported, BMI did not moderate the effect between those who are dissatisfied, wanting to be smaller and eating disorder symptomology. There was no significant interaction between wanting to be smaller and BMI, R^2 = .0539, F (1, 194) = .871, p = .359.

Discussion

The sample in this study is uniquely beneficial to the investigation of obesity and body satisfaction, because of the strong representation of each weight category that occurred naturally in this understudied population. In addition, very few studies have investigated body satisfaction in such a young cohort of girls, and even less include variables such as mother's satisfaction and eating pathology symptoms. In Witherspoon et al., (2013) girls of the same age range as those in the current study were found to be more susceptible to obesity and negative psychological outcomes such as depression, poor body-esteem and self-esteem and were found to become more frequent as weight status increases. This connection between weight status and mental health speaks to the importance of furthering our understanding and discovery of the causal components of obesity, body dissatisfaction, and eating pathology. Doing this would prevent or alleviate future incidence of these negative health outcomes among young girls. The current study is believed to act as a steppingstone in uncovering potential influences that are associated with dissatisfaction, BMI, eating pathology and how these relate between mothers and daughters.

Overall, the main findings of this study involved, the naturally high prevalence of obesity among African American mothers and daughters. This is consistent with previous research on the prevalence of obesity and its prominence among females within this population (Hales et al., 2017, 2018, 2020). This is concerning for the future health of African American adolescent girls of higher weight status, because they are at risk for becoming obese in adulthood (Simmonds et al., 2016; Sun Guo et al., 2002), and also more likely to develop polycystic ovarian syndrome, cardiovascular disease, and type 2 diabetes (De Silva et al., 2007). In addition, being overweight or obese takes a toll on not only on their physical wellbeing but also their psychological and social wellbeing (Witherspoon et al., 2013).

In the initial assessment of body satisfaction excluding weight status, significantly higher rates of body dissatisfaction were observed among African American adolescent girls than what was previously thought. These findings do not align with the majority of past research claiming African American adolescent girls had higher levels of body satisfaction (Bucchianeri et al., 2016; Robbins et al., 2017). This also goes against the Robinson et al., (2002) finding, where girls of lower SES had the lowest level of dissatisfaction. Because the majority of adolescent girls in the present study live in an urban low-income area and still a large portion of them were dissatisfied with their body.

The current study also investigated the relation between BMI and body dissatisfaction. Findings suggest BMI is predictive of about one third of variance in body satisfaction in adolescent girls. This aligns with Mitola and colleagues, (2007), finding for body satisfaction and BMI and the close relation to adolescent level of body satisfaction. Furthermore, results of the Chi Square analysis conducted in the present study revealed, those of higher weight status were more likely to be dissatisfied with their body, with the majority wanting to be smaller as weight status increased. Across each successive BMI category, the majority of normal weight adolescents were satisfied wanting to remain the same, half of overweight adolescents were satisfied, less than a quarter of obese adolescents, and almost none of the severely obese adolescents were satisfied.

What is concerning, although they are not the majority, are the findings for those of higher weight status who are satisfied with their body size and those who are dissatisfied wanting to become larger. It is not entirely clear as to why girls of higher weight status would want to remain the same or become larger, however, this could be explained by participants inaccurately reporting their current body size. Specifically, when girls severely underestimate their current

body size, thus wanting to be larger or remain the same, as a result of perceiving themselves to be much smaller than they truly are. These findings are in agreement with Mitola and colleagues (2007) conclusions that adolescents may not be aware of having an unhealthy body size.

Which begs the question, what does this mean for future health outcomes? It is apparent girls of higher weight status who do not view themselves to be at an unhealthy weight and are satisfied, wanting to remain the same, or dissatisfied, wanting to be larger, are at risk for remaining as such and can lead to unhealthy weight gain overtime, because of the lack of desire to lose weight (Heinberg et al., 2001). Therefore, leaving them susceptible to the negative health outcomes associated with obesity or being overweight (De Silva et al., 2007). Those demonstrating body dissatisfaction also face potential health risk according to Neumark-Sztainer et al., (2006) and Stockton et al., (2009), who found dissatisfaction in girls of higher weight status promotes unhealthy weight loss behaviors that potentially increases their risk of gaining more weight. However, Epperson et al., (2013) found body size and body perceptions were not associated with attempts to lose weight among African American adolescents in the fifth grade. As a result of the inconsistencies in previous studies, it is difficult to confidently infer the potential risk associated with the findings for body satisfaction in the present study.

Under the second aim of this study accuracy in reported current body size in adolescent girls and mothers was assessed. Overall, the majority of adolescent girls were inaccurate and had a tendency to underestimate their current body size, predominantly girls in the normal and overweight categories. These results are similar to the findings in Alwin et al., (2011), Robbins et al., (2017), and Saxton et al., (2009) regarding the high frequency of children underestimating their current body size and indicates a potential risk for weight loss attempts according to Saxton et al., (2009). It should also be noted, a gradual increase in accuracy was observed as weight

category increased in the analysis of the present study, with the exception of the overweight group. Specifically, those in the obese category were very accurate and severely obese were almost completely accurate in reporting their current body size, which does not support findings in Saxton et al., (2009) where accuracy decreased among girls as weight status increased. However, it is possible, that girls in the present study of much more extreme weight status did not really allow them to be inaccurate, because their appearance may be more obvious to identify on the silhouette measure.

This study also evaluated mother's accuracy in estimating their daughters body size. Mothers did tend to underestimate their daughters body size. Mother's underestimation by weight category showed almost all mothers with normal weight daughters identified them as thin, half of the mothers with daughters in the overweight group identified them as normal weight and a little under one third identified them as thin. Mothers with daughters in the obese category identified a little over one third of them as normal weight. Interestingly, none of the mothers with daughters in the severely obese group underestimated their daughters body size. Although there was an overall inaccuracy, the most accurate mothers had daughters in a larger BMI category. Although the majority of both mothers and daughters were inaccurate, mothers had higher rates for underestimation than girls report of themselves. This could be a result of mothers wanting to respond favorably in their reports of their daughter's body size.

These findings are consistent with the results of Chaimovitz et al., (2008) and Maynard et al.,(2003), which also found parents have a higher tendency to underestimate their child's body size. However, our findings do contradict the finding in Maynard et al., (2003) where mothers had a higher probability of over reporting daughters with a BMI in the overweight range. Mothers of the current study did not demonstrate this. It should also be noted that caregivers who

participated in Maynard et al., (2003) and Chaimovitz et al., (2008) used a verbal measure for accuracy which is not directly comparable to the silhouette measure used in the current study.

Next, the study evaluated agreement between mothers and daughters. Overall, there was a high level of agreement between mother and daughter reports for adolescent current body size. Over half of mothers who identified their daughter as thin or normal weight also had daughters who agreed. The majority of mothers who identified their daughters to be overweight had adolescents who identified themselves as overweight as well. This finding potentially indicates perceived body size is influenced by mothers' perceptions. This aligns with Thompson et al., (1999) findings of a significant association between matches on mothers rating and adolescents rating for current body size. However, variability in mother daughter agreement was still found in the present study.

The relationship between BMI, accuracy of reported current body size and eating pathology symptoms were investigated. It was hypothesized adolescents' accuracy for current body size will moderate the relationship between their BMI and eating pathology symptoms and adolescents who accurately perceive their body will have healthier eating attitudes. The initial analysis demonstrated a significant moderating effect however, upon further analysis, this finding did not hold true when examining each weigh status individually and was concluded that the significant effect found in the initial analysis was be attributed to a type II error. This could be a result of the ambiguity of the overall construct of accuracy and the reduction of sample size as they were broken down by weight status.

The ideal body size selected by mothers and daughters, was predicted to be similar between the two and the average ideal would reflect a silhouette in the higher to normal range.

Our findings were partially supported this prediction. Mothers and daughters did demonstrate having similar ideals, but the ideal body size tended toward a slim silhouette. This finding contradicts previous research suggesting African American females have larger body ideals (Alwan et al., 2011; Moiza et al., 2005). This also goes against findings in Chen and Wang (2011) where their results indicated African American adolescent's ideal body size reflects a body size in normal range, and also found overweight and obese girls identified a larger ideal body size than girls of lower weight status. Overall girls in the current study identified a thin silhouette as their ideal body size and girls of larger weight status also identified a thin silhouette most often and as their ideal, but the second most frequent was a silhouette in the normal range.

Another finding of the current study is the majority of mothers were satisfied with their daughter's body size. However, a portion of the sample were mothers and daughters who were dissatisfied with their adolescents body size and wanted them to be smaller. This provides insight as to potential factors at play in body satisfaction. Our findings align well with Mitola et al., (2007), who also found parents demonstrate more satisfaction for their child's body size and higher levels of agreement between parent and child level of satisfaction. Additionally, researchers suggest these findings indicate that parents can help address issues with satisfaction in their adolescents (Mitola et al., 2007).

The fifth aim of this study is to investigate BMI and eating disorder symptomology in adolescent girls and their mothers. The prevalence of eating pathology based on subscale scores of both mothers and daughters is consistent with previous literature, but what was not consistent was the higher scores on the Anorexia subscale than Bulimia subscales. Based on previous reported prevalence's for Anorexia and Bulimia one would expect African American mothers and daughters to have higher scores on the Bulimia subscale rather than Anorexia (American

Psychiatric Association, 2016; Taylor et al., 2007). Although none of their scores were indicative of eating pathology this does give insight to certain dieting or eating behaviors African American females tend to engage in. An increase in pathological eating symptoms and behaviors were also observed to become more frequent as weight status increased.

It was also predicted there will be a positive association between adolescent girls' BMI and eating disorder symptomology. A positive association was found between BMI and the Anorexia and Bulimia subscales, this demonstrates that those of higher weight status tend to have higher scores on both measures. These findings support the Stockton et al., (2009) finding, where girls of higher weight status are four times more likely to engage in dieting. The positive associations between BMI and eating pathology subscales indirectly, confirms Neumark-Sztainer et al., (2007) finding indicating inappropriate dieting behavior leads to weight gain.

Results testing for an association between mothers and daughters eating pathology scores indicated there is no association between them. It is not clear as to why they are not associated, it could be a result of the fact that there was a low level of endorsement overall, thus no association between the two could be detected.

The final aim of this study is to investigate body dissatisfaction, BMI, and eating disorder symptomology. It was predicted that BMI will moderate the relation between body dissatisfaction and eating disorder symptoms. This prediction was not supported. BMI did not demonstrate having a moderation effect between level satisfaction and scores for eating pathology.

Limitations

Silhouettes are a highly reliable and valid measure for body satisfaction and has been associated with BMI in African and African American samples (Mitola et al., 2007; Pulvers et al, 2004; Stunkard et al., 1983 & Yepes et al., 2015). Upon examining the Culturally Adapted 9-point-silhouette Scale, a few limitations are apparent. First, it does not account for affect. It assumes what participants are feeling about their body based on the difference between their identified current and ideal body sizes. Also because there is a lack of consistency across measures for the construct of satisfaction and perception it is difficult to understand which measure is the most accurate. Results in Alwan et al., (2011) demonstrated this in their contradictory findings using both a verbal and visual measure for body perception.

Another limitation is the misuse and misunderstanding BMI and BMI percentiles. This is an issue because BMI is a proximal measure for obesity. It calculates a person's ideal weight based on their height relative to their weight, not body fat percentage (CDC, 2020b; Brewis, 2010). Obesity is medically defined as excess body fat that is potentially harmful to one's metabolic health (Brewis, 2010; Welcome, 2017). Contrarily, the CDC (2020b.) defines obesity through the categorization of weight status by measuring one's BMI. The CDC acknowledges this does not assess body fat nor does it act as a direct indicator of any type of health risk associated with obesity (CDC, 2020b). Another problem exists with child BMI percentiles due to the limitation caused by the use of growth chart standards used to create these categories (CDC, 2020a).

It has been shown that ethnicities had different averages for BMI, for example Polynesian BMIs were lower than those of European decent and African Americans were found to have

higher average BMI than people of Indonesian and European decent (Brewis, 2010). Thus indicating that a standard BMI cut off for all ethnicities may lead to over estimation of obesity and it prevalence (Brewis, 2010).. In addition, the variations in BMI formulas can also contribute to the problem (Brewis, 2010).

One of the most concerning problems with the use of BMI is that people are being labeled as obese and are not necessarily suffering from the disease of obesity, they just possess a certain height and weight status associated with it. This misleading term undermines peoples understanding of its medical meaning. This misunderstanding of the meaning behind being classified as obese, can lead to stigmatization and negative affect about one's self. However, BMI should not be dismissed entirely, as it has shown to be beneficial in sedentary individuals and BMI percentiles have informed doctors of what most children are weigh and how tall they are growing (CDC, 2020a;CDC, 2020b).

Future Directions

The use of different measures in various research studies assessing body satisfaction and/or body perception can explain the inconsistency in previous research and the variability in findings of African American girl's body satisfaction and body ideals. Future studies assessing body satisfaction or body perception should make a point of also incorporating measuring body-esteem or including a body satisfaction questionnaire to counterbalance the limitations of visual and verbal measures for body perception and satisfaction.

To address the previously mentioned limitation of BMI, future research should include more than one measure for weight status, such as waste circumference, which has been found to

be a strong predictor of metabolic disease in obese adolescents (Bluher et al., 2013). Although this tool also has its limitations, using them together can counterbalance the limitations of each measure. Future research should also control for puberty, include boys, other ethnicities, family and friends beliefs and perceptions in order to examine the influence of these variables, on a child's body satisfaction, body perception, body ideals, and eating pathology.

An acculturative stress measure in the present study could also have been beneficial and possibly help explain a particular influence of culture, body image, and weight perceptions (Kroom Van Diest et al., 2014). Including measures like this is important for future research and would be beneficial in furthering our understanding in the differences within this population. Whaley et al., (2011) emphasized the importance of learning more about these within group differences to improve our understanding of African American physical and mental health. Furthermore, researchers should prioritize examining both between group and within group differences when examining any variables of interest in regard to ethnic groups.

Assessing environmental factors and approaching health intervention for adolescent at a communal level is the key to alleviating the epidemic of obesity and prevention of disordered eating. Golan and colleagues (2004) discuss the obesogenic environment and how this contributes to childhood obesity and eating disorders. Obesogenic environment is where people idealize thinness yet engage in indulgent eating habits or high calorie diets (Golan & Crow, 2004). This environmental approach allows for an integrated understanding of factors like familial influence and that shape body satisfaction, obesity, and eating pathology and creates a clear avenue in which future studies should direct their focus. Additionally, using an environmental approach for weight loss intervention, has been proven to promote healthy eating habits and healthy weight loss in younger children (Golan & Crow, 2004). This approach has

also proven effective in eating disorder intervention (Golan & Crow, 2004). Future research should take this one step further and include assessment of any factors in an adolescent's home and school environment that reflect dynamics of an obesogenic environment, as well as monitoring for how often of these types of messages or behaviors are witnessed or engaged in by the adolescent in as many settings and contexts as possible.

In addition, more research needs to investigate components of beauty and African American culture. Similar to the work of Parker and Colleagues (1995) and Moiza and colleagues (2005, 2011), future approaches should involve the use of an open interview where participants speak about what they believe about beauty and how they feel when they do or do not meet their own personal ideals. This information should be used as a baseline to understand the individual's relation to beauty and self, in other words what factors weigh more heavily on their sense of self-worth.

All future research involving ethnic minorities should consider the inconsistency in previous research regarding African Americans body satisfaction, weight status, and eating disorder symptoms to be the example of the need to further examine the assumptions made about minorities. It demonstrates the need for researchers to expand their awareness beyond the variables of interest or research at large and invest more research into participants as wholistic individuals. By doing this, researchers can create better control through the use of additional measures, multiple contexts, etc. to help explain why there are differences or similarities between and within minority groups. In addition to this, researchers should reframe from dismissing groups with a lower prevalence when making ethnic comparisons.

Conclusions

Adolescent African American girls in the present study demonstrate a high prevalence of obesity and low prevalence of eating pathology symptoms. The high levels of dissatisfaction wanting to be larger or wanting to be smaller illustrates the need to further investigate factors that contribute to this. What is also apparent is the need to further our understanding of African American beauty ideals and how large of a role body size actually plays in their assessment of themselves.

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Tables

Table 1. *Adolescent Demographic & Baseline Data: Age, Grade Level, & BMI Categories*

Adolescent Demographics

Variable	***n*** (%)	***M*** (***SD***)
Sample Size	516	
Age in years		11.67 (.725)
10 y/o	10 (1.9%)	
11 y/o	215 (41.7%)	
12 y/o	231 (44.8%)	
13 y/o	56 (10.9%)	
14 y/o	4 (.8%)	
Grade Level		6.47 (.499)
6th	276 (53.5%)	
7th	240 (46.5%)	
BMI Percentiles*		
Normal weight	245 (47.8%)	
BMI ≥ 5% and < 85%		
Overweight	99 (19.2%)	
BMI ≥ 85% and < 95%		
Obese	116 (22.5%)	
BMI ≥ 95% and < 99%		
Severely Obese	53 (10.3%)	
BMI ≥ 99%		

* (n = 3) underweight adolescents were excluded as a result of the sample size being insufficient for analysis

Table 2. *Mother Demographic & Baseline Data: Age, Work Hours, SES, & BMI Categories*

Mother Demographics

Variable	***n*** (%)	***M*** (***SD***) Range
Sample Size	288	
Age	253	37.16 (6.92) 25.13-64.72
Hours Worked Per Week	269	36.45 (14.48)
0 to < 20 hrs.	21 (7.8%)	
≥ 20 to < 35 hrs.	26 (9.7%)	
≥ 35 to ≤ 45 hrs.	130 (48.3%)	
> 45 hrs.	92 (34.2%)	
Living at or Below Poverty Line	251	
No	137 (54.6%)	
Yes	114 (45.4%)	
BMI*	272	31.55 (7.58)
Normal weight BMI ≥ 18.5 or < 25	50 (18.4%)	
Overweight BMI ≥ 25 or < 30	84 (30.9%)	
Obese BMI ≥ 30 or < 40	103 (37.9%)	
Severely Obese BMI ≥ 40	35 (12.9%)	

* (n = 3) underweight mothers were excluded as a result of the sample size being insufficient for analysis

Table 3. *Adolescent's Average CheEAT Scoree: Anorexia & Bulimia Subscales*

	Anorexia Subscale				
Adolescent BMI	*n*	*M*	*S.D.*	Min.	Max.
Normal	259	3.79	4.518	0	32
Overweight	88	6.14	6.692	0	28
Obese	104	8.17	6.943	0	30
Severely Obese	49	8.82	6.160	0	24
Total	464	5.75	6.087	0	32
	Bulimia Subscale				
Adolescent BMI	*n*	*M*	*S.D.*	Min.	Max.
Normal	223	.91	2.201	0	20
Overweight	88	1.70	3.468	0	18
Obese	104	2.30	3.447	0	16
Severely Obese	49	2.65	3.401	0	15
Total	464	1.56	2.980	0	20

Table 4. *Mother's Average EAT Scores: Anorexia & Bulimia Subscales*

	Parent Eating Attitude Test EAT- 26 Anorexia Subscale				
Mother's BMI	*n*	*M*	*S.D.*	Min.	Max.
Normal Weight	47	2.87	3.004	0	18
Overweight	80	4.33	4.286	0	19
Obese	103	4.51	3.630	0	18
Severely Obese	35	5.43	4.698	0	20
Total	265	4.29	3.944	0	20
	Bulimia Subscale				
Mothers BMI	*n*	*M*	*S.D.*	Min.	Max.
Normal Weight	47	.15	.589	0	3
Overweight	81	.23	.855	0	6
Obese	103	.14	.506	0	3
Severely Obese	35	.26	.852	0	4
Total	266	.18	.689	0	6

Table 5. χ^2 *Chi Square Results: Adolescent Body Satisfaction & BMI*

			Body Satisfaction Category			
			Dissatisfied: Wants to Be ***Larger***	**Satisfied**: Remain the ***Same***	**Dissatisfied**: Wants to Be ***Smaller***	
						Total
Adolescent BMI Category	Normal Weight	*n* (%)	32 (13.7%)	**164** (70.4%)	37 (15.9%)	233 (100%)
	Overweight		2 (2.1%)	***50*** (51.5%)	***45*** (46.4%)	97(100%)
	Obese & Severely Obese		2 (1.3%)	26 (16.5%)	**130** (82.3%)	158 (100%)
	Total		36 (7.4%)	240 (49.2%)	212 (43.4%)	488 (100%)

χ^2 (4) = 176.091, p <.001.

Table 6. χ^2 *Results: Using BMI to Test the Accuracy of Adolescents' Current Body Size*

		Adolescent BMI Category				
		Normal Weight	Overweight	Obese	Severely Obese	
			n (%)			Total
Perceived Current Body Size	Thin Silhouette	**141 (60.5%)**	**18 (18.6%)**	**3 (2.7%)**	**2 (4.2%)**	164 (33.6%)
	Normal Silhouette	*85 (36.5%)*	**65 (67.0%)**	**43 (39.1%)**	**1 (2.1%)**	194 (39.8%)
	Overweight Silhouette	**7 (3.0%)**	*14 (14.4%)*	*64 (58.2%)*	*45 (93.8%)*	130 (26.6%)
	Total	233	97	110	48	488

χ^2 (6) = 312.75, p <.001.

Table 7. χ^2 *Results: Using BMI to Test the Accuracy of Mother's Report of Daughter's Current Body Size*

			Mothers Report of Daughters Current Body Size			
			Thin Silhouette (1-3)	Normal Silhouette (4-6)	Overweight Silhouette (7-9)	Total
Adolescent BMI Category	Normal Weight	*n* (%)	106 (84.8%)	18 (14.4%)	1 (0.8%)	125
	Overweight		16 (32.0%)	29 (58.0%)	5 (10.0%)	50
	Obese		2 (3.6%)	18 (32.1%)	36 (64.3%)	56
	Severely Obese		0 (0.0%)	0 (0.0%)	27 (100%)	27
	Total		124 (48.3%)	75 (25.2%)	69 (26.7%)	258

χ^2 (6) = 229.232, $p < .001$

Table 8. χ^2 *Results: Assessing Patterns in Mother and Daughter Report of Daughter's Current Body Size*

			Mothers Report of Daughters Current Body Size			
			Thin Silhouette	Normal Silhouette	Overweight Silhouette	**Total**
Adolescent Perceived Current Body Size	Thin Silhouette	*n* (%)	**67 (85.9%)**	9 (11.5%)	3 (2.6%)	87 (100%)
	Normal Silhouette		48 (48%)	**38 (38%)**	14 (14%)	115 (100%)
	Overweight Silhouette		3 (4.6%)	15 (23.1%)	**50 (72.3%)**	70 (100%)
	Total		118 (48.6%)	62 (25.5%)	63 (25.9%)	243 (100%)

χ^2 (4) = 136.322, $p < .001$

Table 9. χ^2 *Results: Examining Patterns Between Mother & Daughter Reported Satisfaction*

		Mother Satisfaction			
		Dissatisfaction: Mother wants child to be ***larger***	**Satisfaction**: Mother wants child to remain the ***same***	**Dissatisfaction:** Mother wants child to be ***smaller***	Total
		n (%)			
Adolescent Body Satisfaction	**Dissatisfaction:** wants to be ***larger***	**1 (20.0%)**	16 (9.2%)	0 (0.0%)	17 (7.1%)
	Body Satisfaction: wants to remain the ***same***	4 (80%)	**108 (62.1%)**	9 (14.5%)	121 (50.2%)
	Dissatisfaction: wants to be ***smaller***	0 (0.0%)	50 (28.7%)	**53 (85.5%)**	103 (42.7%)
	Total	5 (100.0%)	174 (100.0%)	62 (100.0%)	241 (100.0%)

χ^2 (4) = 64.809, p <.001.

Figures

Figure 1. *Overall Adolescent Body Satisfaction*

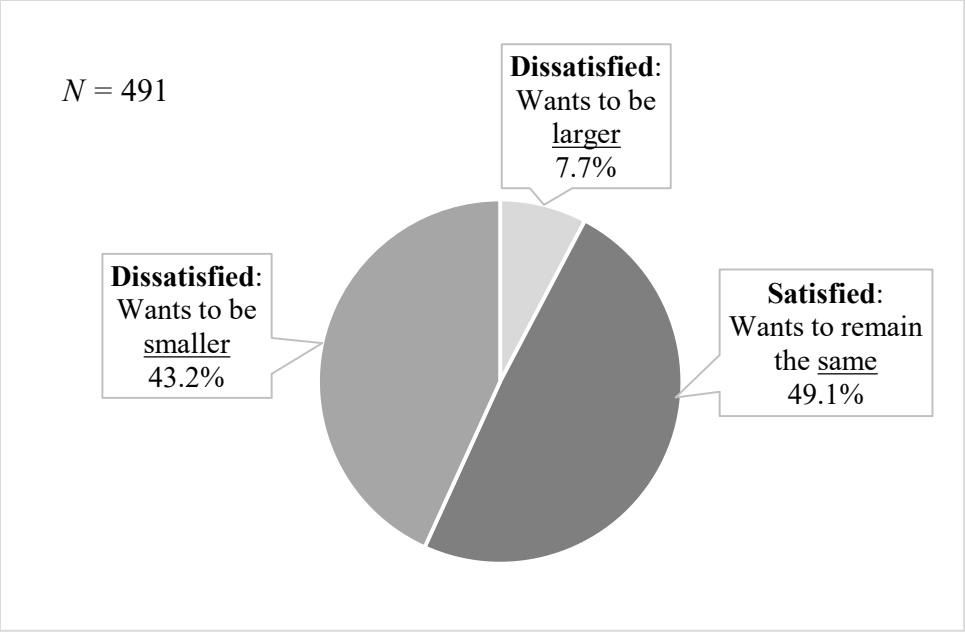


Figure 2. *Adolescent Body Satisfaction: Normal BMI*

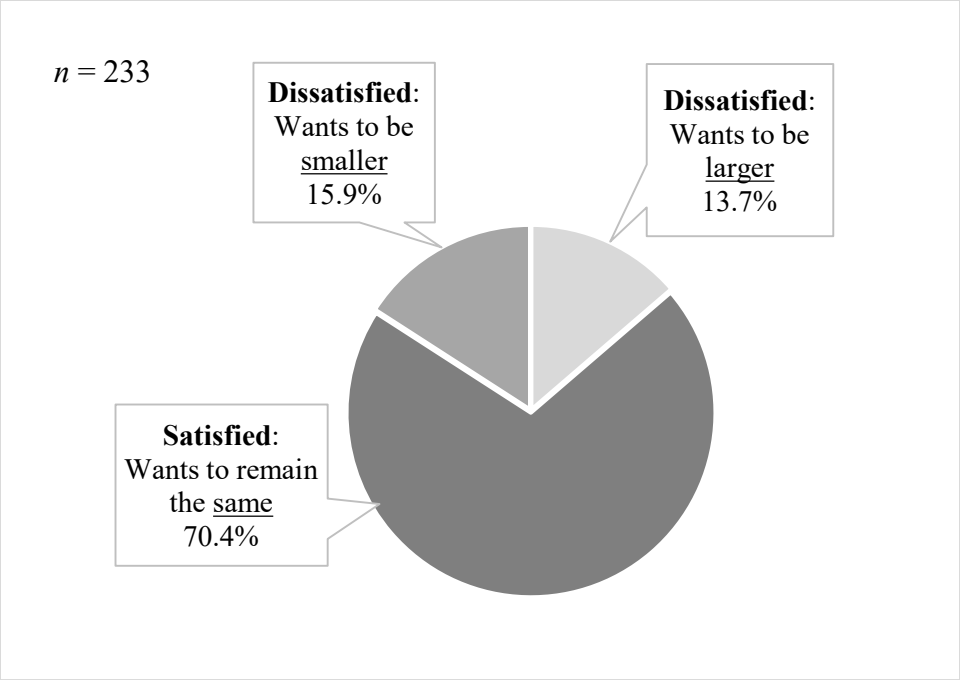


Figure 3. *Adolescent Body Satisfaction: Overweight BMI*

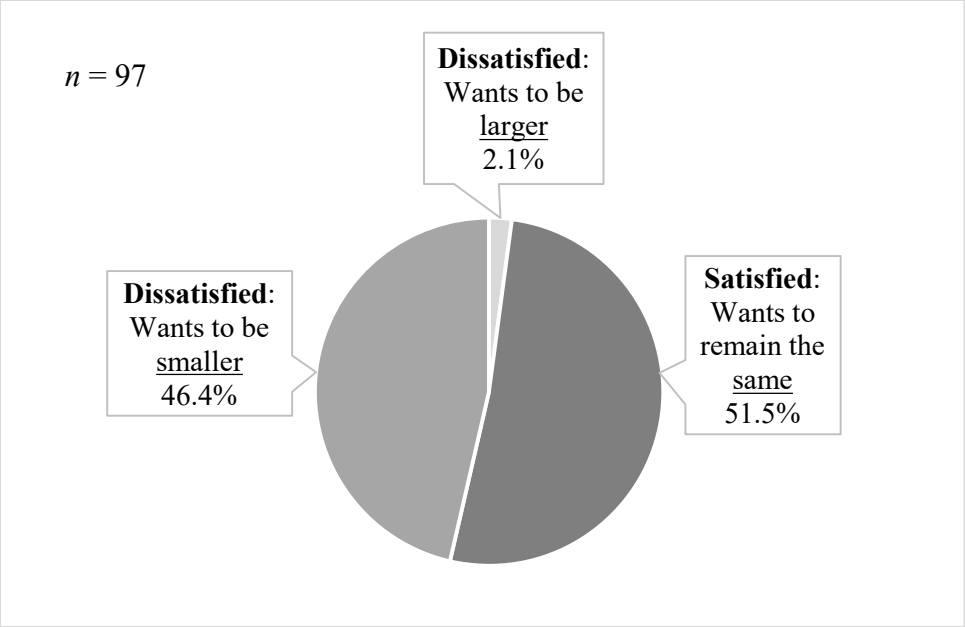


Figure 4. *Adolescent Body Satisfaction: Obese BMI*

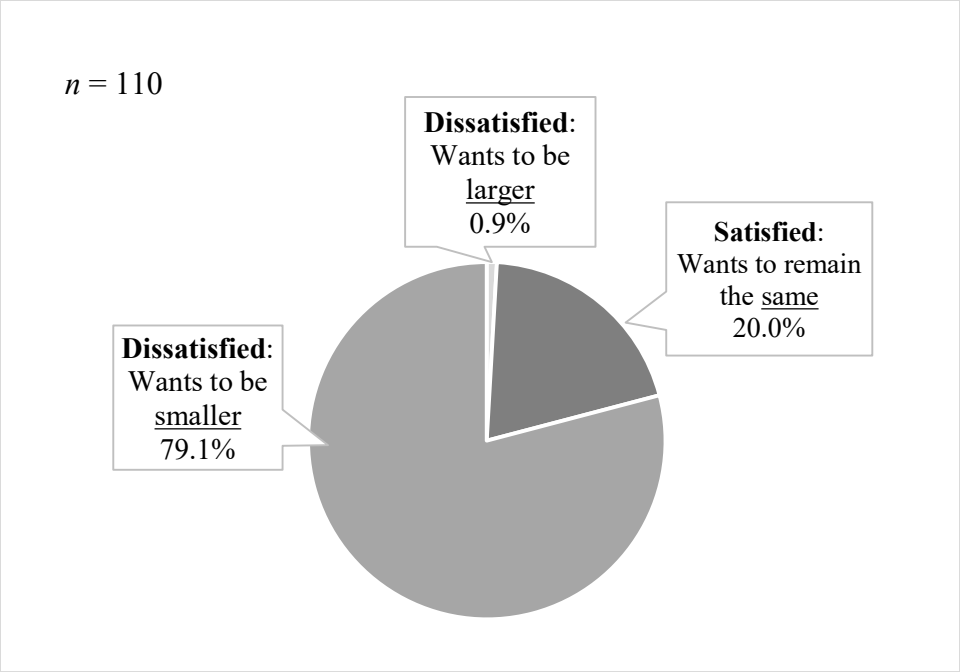


Figure 5. *Adolescent Body Satisfaction: Severely Obese BMI*

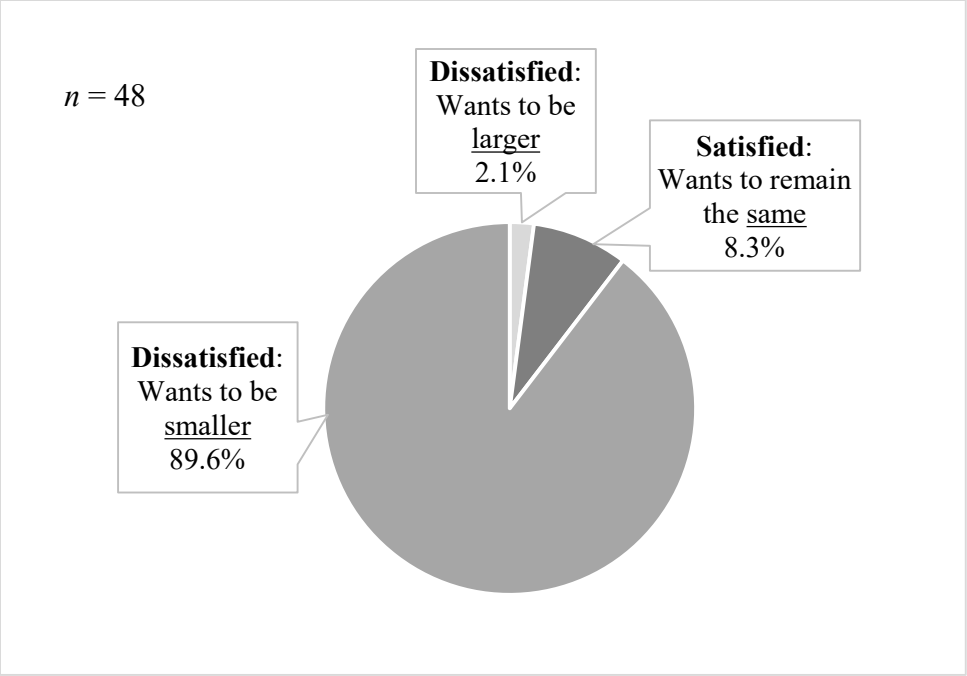


Figure 6. *Model 1: Moderation Model for BMI, Perceived Current Body Size, and Eating Disorder Symptoms Scores*

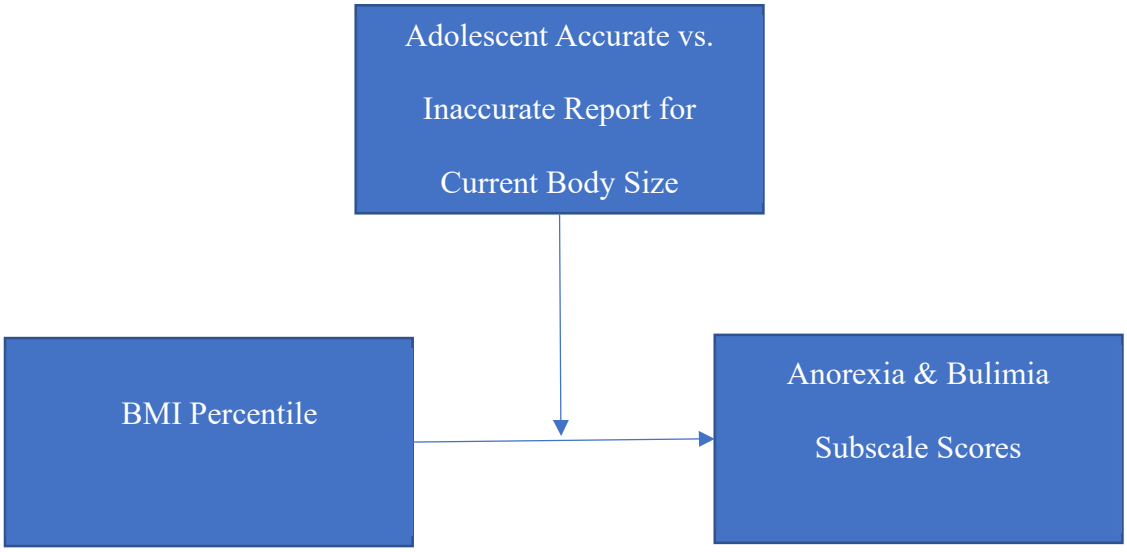


Figure 7. *Model 2: Model for Moderation analysis between BMI, Mother's Satisfaction with Daughter's Body Size, & Daughters Satisfaction with Her Own Body*.

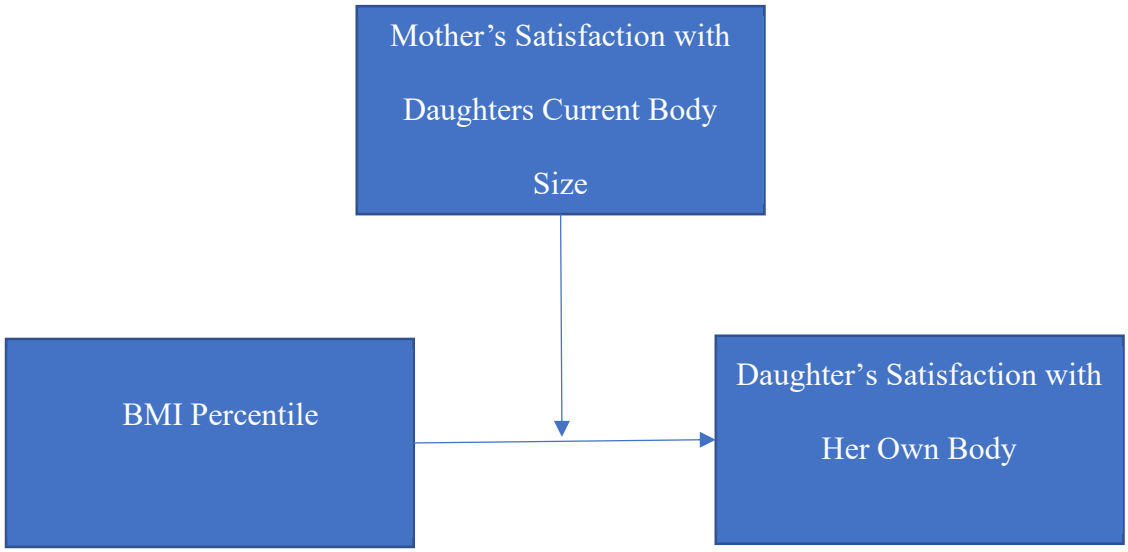


Figure 8. *Correlation Results: BMI and Anorexia Subscale Scores*

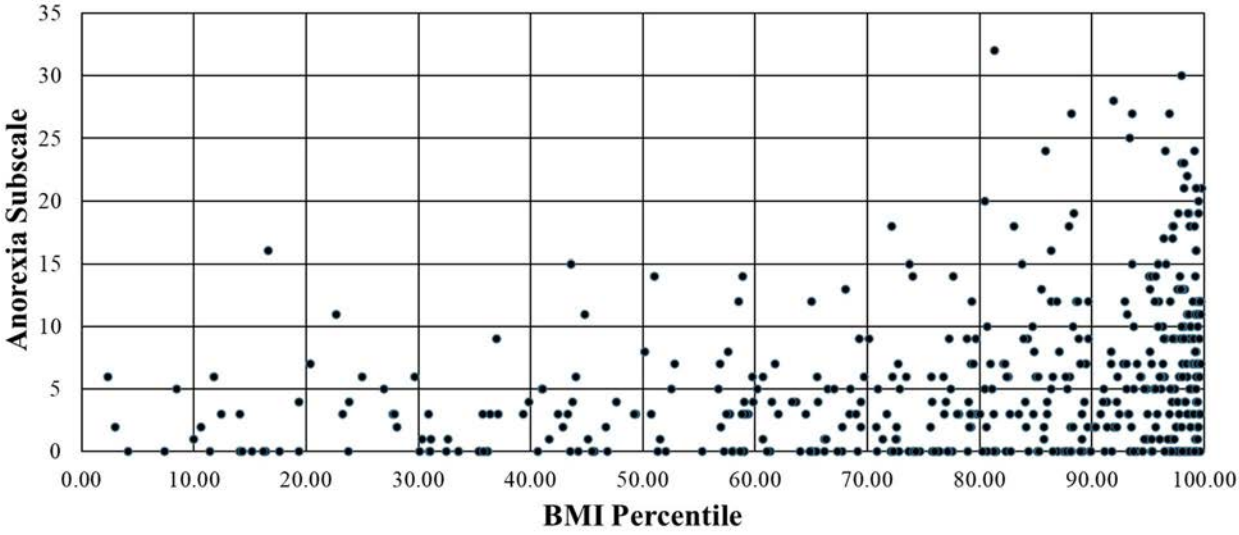


Figure 9. *Correlation Results: BMI and Anorexia Subscale Scores*

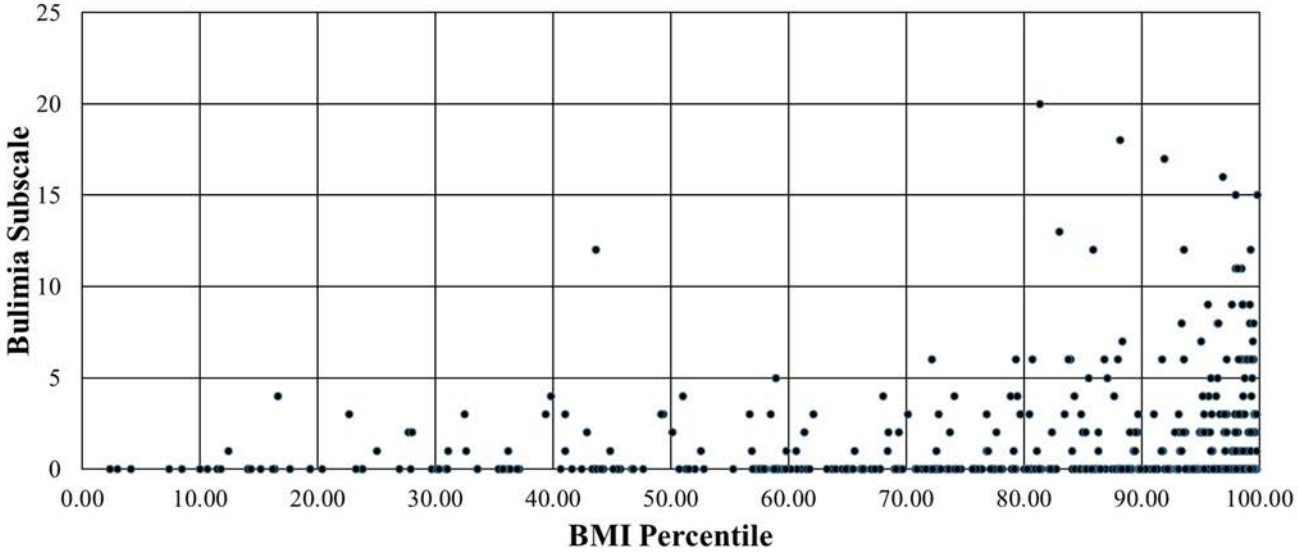
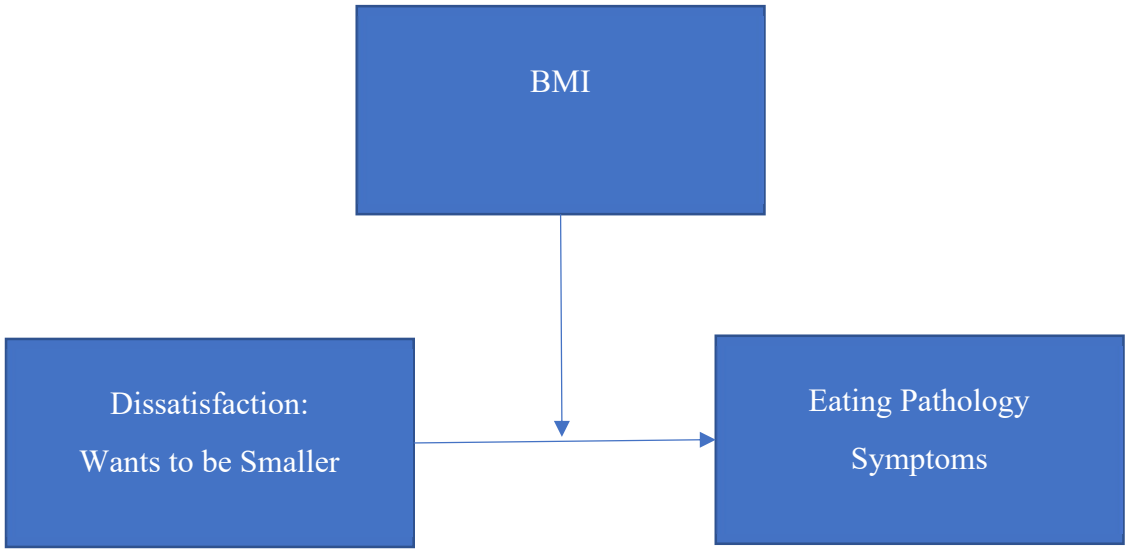


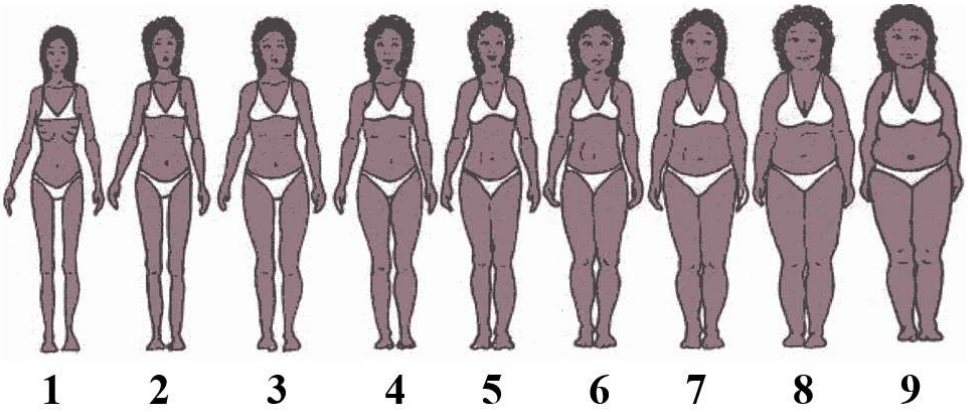
Figure 10. *Model 3: Model for Moderation analysis between BMI, Adolescent Dissatisfaction, & Eating Pathology Symptoms*



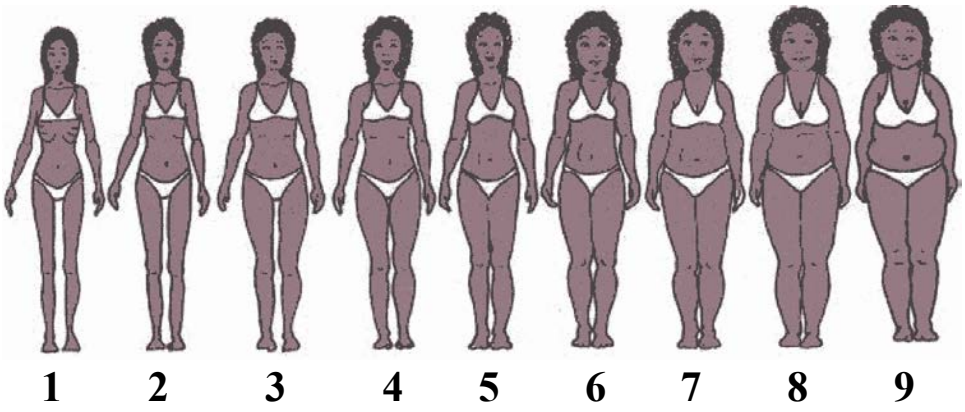
Appendix A
Child Body Satisfaction Questionnaire

This questionnaire was given to adolescents about their own body size and was used in the present study to measure perceived and ideal body size as well as body satisfaction.

1. **Select the body size that looks most like you**



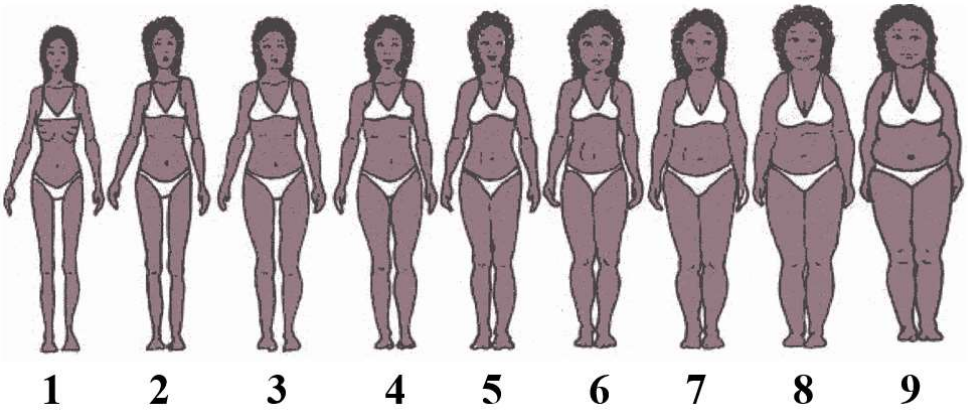
2. **Select the body size that you would like to be**



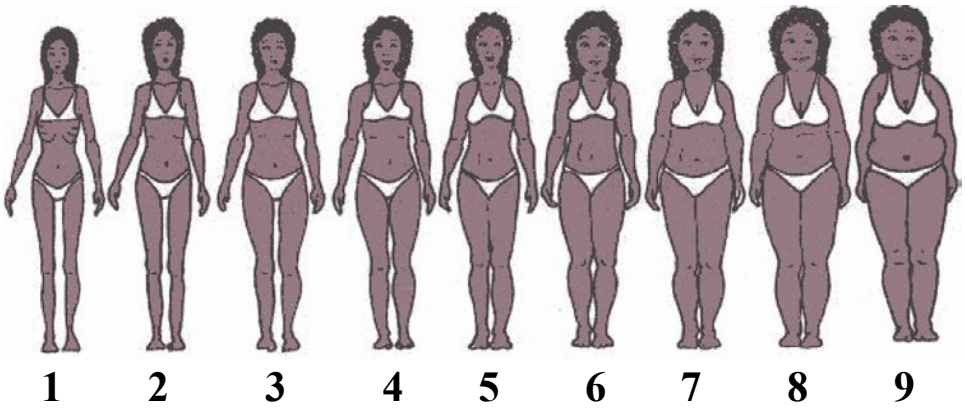
Appendix B
Parent Body Size Satisfaction Questionnaire

This questionnaire was given to mothers about her adolescent's body size and used in the present study to measure perceived and ideal body size as well as body satisfaction.

1. **Select the body size that looks most like your child.**



2. **Select the body size that you would like your child to be.**



Appendix C
Child Eating Attitudes Questionnaire (ChEAT)

This questionnaire was given to adolescents about their thoughts and behaviors that pertain to food and was used in the present study to assess eating pathology. The questions highlighted are those used in the present study.

Please circle the word that best applies to the following statements.

1. I am scared about being overweight

Always Very often Often Sometimes Rarely Never

2. I stay away from eating when I am hungry

Always Very often Often Sometimes Rarely Never

3. I think about food a lot of the time

Always Very often Often Sometimes Rarely Never

4. I have gone on eating binges where I feel that I might not be able to stop

Always Very often Often Sometimes Rarely Never

5. I cut my food into small pieces

Always Very often Often Sometimes Rarely Never

6. I am aware of the energy (calorie) content in foods that I eat

Always Very often Often Sometimes Rarely Never

7. I try to stay away from foods such as breads, potatoes and rice

Always Very often Often Sometimes Rarely Never

8. I feel that others would like me to eat more

Always Very often Often Sometimes Rarely Never

9. I vomit or throw up after I have eaten

Always Very often Often Sometimes Rarely Never

10. I feel very guilty after eating

Always Very often Often Sometimes Rarely Never

11. I think a lot about wanting to be thinner

Always Very often Often Sometimes Rarely Never

12. I think about burning up energy (calories) when I exercise

Always Very often Often Sometimes Rarely Never

13. Other people think I am too thin

Always Very often Often Sometimes Rarely Never

14. I think a lot about having fat on my body

Always Very often Often Sometimes Rarely Never

15. I take longer than others to eat my meals

Always Very often Often Sometimes Rarely Never

16. I stay away from foods with sugar in them

Always Very often Often Sometimes Rarely Never

17. I eat diet foods

Always Very often Often Sometimes Rarely Never

18. I think that food controls my life

Always Very often Often Sometimes Rarely Never

19. I can show self-control around food

Always Very often Often Sometimes Rarely Never

20. I feel that others pressure me to eat

Always Very often Often Sometimes Rarely Never

21. I give too much time and thought to food

Always Very often Often Sometimes Rarely Never

22. I feel uncomfortable after eating sweets

Always Very often Often Sometimes Rarely Never

23. I have been dieting

Always Very often Often Sometimes Rarely Never

24. I like my stomach to be empty

Always Very often Often Sometimes Rarely Never

25. I enjoy trying new rich foods

Always Very often Often Sometimes Rarely Never

26. I have the urge to vomit or throw up after eating

Always Very often Often Sometimes Rarely Never

Appendix D

Eating Attitude Test

Garner D.M. and Garfinkel P. E., 1989

This questionnaire was given to mothers about their thoughts and behaviors that pertain to food and was used in the present study to assess eating pathology.

1. I like eating with other people.
   - ❑ Always
   - ❑ Very Often
   - ❑ Often
   - ❑ Sometimes
   - ❑ Rarely
   - ❑ Never

2. I prepare food for others but do not eat what I cook.
   - ❑ Always
   - ❑ Very Often
   - ❑ Often
   - ❑ Sometimes
   - ❑ Rarely
   - ❑ Never

3. I become anxious prior to eating.
   - ❑ Always
   - ❑ Very Often
   - ❑ Often
   - ❑ Sometimes
   - ❑ Rarely
   - ❑ Never

4. I am terrified about being overweight.
   - ❑ Always
   - ❑ Very Often
   - ❑ Often
   - ❑ Sometimes
   - ❑ Rarely
   - ❑ Never

5. I avoid eating when I am hungry.
   - ❑ Always
   - ❑ Very Often
   - ❑ Often
   - ❑ Sometimes
   - ❑ Rarely
   - ❑ Never

6. I find myself preoccupied with food.
   - ❑ Always
   - ❑ Very Often

- ❑ Often
- ❑ Sometimes
- ❑ Rarely
- ❑ Never

7. I have gone on eating binges where I feel that I may not be able to stop.
   - ❑ Always
   - ❑ Very Often
   - ❑ Often
   - ❑ Sometimes
   - ❑ Rarely
   - ❑ Never

8. I cut my food into small pieces.
   - ❑ Always
   - ❑ Very Often
   - ❑ Often
   - ❑ Sometimes
   - ❑ Rarely
   - ❑ Never

9. I am aware of the calorie content of foods that I eat.
   - ❑ Always
   - ❑ Very Often
   - ❑ Often
   - ❑ Sometimes
   - ❑ Rarely
   - ❑ Never

10. I particularly avoid foods with a high carbohydrate content (e.g. bread, potatoes, rice, etc.).
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

11. I feel bloated after meals.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

12. I feel that others would prefer if I ate more.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

13. I vomit after I have eaten.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

14. I feel extremely guilty after eating.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

15. I am preoccupied with a desire to be thinner.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

16. I exercise strenuously to burn off calories.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

17. I weigh myself several times a day.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

18. I like my clothes to fit tightly.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

19. I enjoy eating meat.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

20. I wake up early in the morning.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

21. I eat some food day after day.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

22. I think about burning up calories when I exercise.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

23. I have regular menstrual periods.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

24. Other people think that I am too thin.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

25. I am preoccupied with the thought of having fat on my body.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

26. I take longer than others to eat my meals.
    - ❑ Always
    - ❑ Very Often
    - ❑ Often
    - ❑ Sometimes
    - ❑ Rarely
    - ❑ Never

Appendix E
Primary Caregiver Baseline Data Questionnaire

This questionnaire was given to mothers and used to assess family information, hours worked per-week, and income which was used to assess if they were at or below the poverty line.

Primary Caretaker

Baseline Demographics Interview Form

ID: _____ **Today's date:** _____/_____/_____ **Your date of birth:** ____/____/_____
mm / dd / yyyy mm / dd / yyyy

What is your gender?

- ❑ male ❑ female

What is your relationship to the teen?

- ❑ Mother
- ❑ Father
- ❑ Grandfather
- ❑ Grandmother
- ❑ Brother
- ❑ Sister
- ❑ Stepfather/mother's partner
- ❑ Stepmother/father's partner
- ❑ Aunt
- ❑ Uncle
- ❑ Cousin
- ❑ Other relative
- ❑ Non-relative

Does your teen have any disabilities that would prevent him/her from being physically active?

- ❑ Yes
- ❑ No

Is there a history of Diabetes in your family?

- ❑ Yes
- ❑ No

If YES, Who? (check all that apply)

- ❑ Teen's Mother
- ❑ Teen's Father
- ❑ Teen's Paternal Grandfather
- ❑ Teen's Paternal Grandmother
- ❑ Teen's Maternal Grandfather
- ❑ Teen's Maternal Grandmother
- ❑ Teen's Brother
- ❑ Teen's Sister
- ❑ Teen's Aunt on father side
- ❑ Teen's Uncle on father side
- ❑ Teen's Aunt on mother side
- ❑ Teen's Uncle on mother side
- ❑ Teen's Cousin
- ❑ Other relative

What is the highest grade you have completed?

- ❑ 5th grade or less
- ❑ 6th
- ❑ 7th
- ❑ 8th
- ❑ 9th
- ❑ 10th
- ❑ 11th
- ❑ 12th
- ❑ GED
- ❑ Some college
- ❑ Vocational school
- ❑ Associate degree
- ❑ Bachelor's degree
- ❑ Master's degree
- ❑ Doctorate degree

How often do you work for money?

- ❑ Unemployed
- ❑ Retired
- ❑ Work part-time (less than 25 hours per week)
- ❑ Work full-time (25 or more hours per week)

What is your household income?

	Per Year	Per Month	Per Week
❑	Less than $5,000	Less than $418	Less than $97
❑	$5,000 - $9,999	$418 - $833	$97 - $192
❑	$10,000 - $14,999	$834 - $1,250	$193 - $288
❑	$15,000 - $19,999	$1,251 - $1,666	$289 - $384
❑	$20,000 - $24,999	$1,667 - $2,083	$385 - $480
❑	$25,000 - $29,999	$2,084 - $2,500	$481 - $576
❑	$30,000 - $34,999	$2,501 - $2,916	$577 - $673
❑	$35,000 - $39,999	$2,917 - $3,333	$674 - $769
❑	$40,000 - $44,999	$3,334 - $3,750	$770 - $865
❑	$45,000 - $49,999	$3,751 - $4,166	$866 - $961
❑	More than $50,000	More than $4,167	More than $961

How many people are dependent on this income? _____

Who resides in the same household with the teen?

- ❑ Mother
- ❑ Father
- ❑ Father's partner
- ❑ Mother's partner
- ❑ Brothers, # _____
- ❑ Sisters, # _____
- ❑ Grandmother
- ❑ Grandfather
- ❑ Aunts/Uncles, # _____
- ❑ Cousins, # _____
- ❑ Other Relatives, # _____
- ❑ Non-relatives, # _____