Health Habits, Wellness, and Behavior of Male Student Athletes Participating in High School Sports

by

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Abstract

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Muscle Dysmorphia (MD) is a pathological preoccupation with muscularity, more common in men than in women. MD is estimated to affect several hundreds of thousands of individuals. There has been little research related to MD in the male adolescent population and the prevalence is unknown. The mean age of onset of MD is estimated to be 19 years, and sports participation increases the risk for developing MD as well as other psychological difficulties. The pilot study revealed a potential relationship between MD symptoms and athletic and academic performance, low levels of self-esteem, high levels of perfectionist qualities, and use of performance-enhancing drugs. This study was conducted to substantiate previous findings and to understand MD symptomatology among male adolescent student athletes and its relation to athletic and academic performance as well as media influence, low levels of self-esteem, high levels of perfectionist qualities, and the use of performance-enhancing drugs. Participants included 67 male student athletes ages 14 through 18 who completed a four-page questionnaire. Results showed that MD symptomatology is prevalent among male high school athletes and is positively correlated with perfectionism and media influence. Current findings indicate the need for school programs and treatments to address MD symptoms. Further, the results offer

important implications for school psychologists to make meaningful contributions in the school system through professional development to staff, counseling for students, and collaboration with parents.

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CHAPTER I

Introduction

Muscle Dysmorphia (MD) is a pathological preoccupation with muscularity in individuals in which they fear they look too weak or small (Olivardia, 2001). Although the exact prevalence is unknown, it is estimated that several hundreds of thousands of individuals have MD or subclinical symptoms of the disorder, and MD is more common in men than in women (Olivardia, 2007; Pope, Gruber, Choi, Olivardia, & Phillips, 1997). Muscle Dysmorphia and eating disorders seem to be closely related (Olivardia, Pope, & Hudson, 2000). Olivardia et al. (2000) found that men with symptoms of MD scored similarly on the Eating Disorder Inventory (EDI) subscales (Garner, Olmstead, & Polivy, 1983) when compared to participants with eating disorders. However, the mean total Eating Disorders Inventory score for 24 participants with muscle dysmorphia was 44.3 versus 21.9 for the normal control comparison group. Further evidence to support the relationship showed that 29% of men with symptoms of MD reported a current or past history of an eating disorder (Olivardia et al., 2000).

The mean age of onset of MD is 19.4 +/- 3.6 years (Olivardia, Pope, & Hudson, 2000) and is common among individuals who participate in power sports, weightlifting, and bodybuilding (Baghurst & Lirigg, 2009; Cafri, Olivardia, & Thompson, 2008; Cafri, van den Berg, & Thompson, 2006; Lantz Rhea, & Cornelius, 2002). Media influence also predicts MD symptoms in male adolescents. Further, individuals with MD symptoms present with increased incidences of obsessive-compulsive symptomatology (Chandler, Grieve, Derryberry, & Pegg, 2009; Maida & Armstrong, 2005; Wolke & Sapouna, 2008), perfectionist qualities (Buhlman, Etcoff, & Wilhelm, 2008; Davis, Karvinen, & McCreary, 2005; Kuennen & Waldron, 2007; Sassaroli et al., 2008), low self-esteem (Chaney, 2008; Olivardia et al., 2004; Philips, Pinto, &

Jain, 2004), depression (Maida & Armstrong, 2005; Wolke & Sapouna, 2008), negative affect (Cafri et al., 2006; Ebbeck, Watkins, Concepcion, Cardinal, & Hammermeister, 2009), and use of performance-enhancing drugs (Baghurst & Lirigg, 2009; Cole, Smith, Halford, & Wagstaff, 2003; Kanayama, Barry, Hudson, & Harrison, 2006; Olivardia et al., 2000; Olivardia et al., 2004). The studies cited, however, were conducted primarily on adult males.

There has been little research related to MD in the male adolescent population and the prevalence is unknown (Cafri, Olivardia, & Thompson, 2008). Because the mean age of onset of MD is estimated to be within the adolescent age range (19 +/- 3.6 years; Olivardia et al., 2000), adolescent students may demonstrate MD symptoms that may or may not affect their athletic and/or academic performance. Males diagnosed with MD show high body dissatisfaction, preoccupation with how they look, and most exercise frequently and compulsively (Pope et al., 1997). Males with MD also show symptoms of mood and anxiety disorders (Olivardia et al., 2000). These symptoms may be particularly troublesome during the high school years when adolescents experience significant developmental changes. Therefore, the present research will help to gain a better understanding of the psychological effects of MD at the high school-age level, particularly among athletes, and its relation to academic performance.

Sports participation, specifically participation in power sports, weightlifting, and bodybuilding (Baghurst & Lirigg, 2009; Cafri et al., 2008; Cafri et al., 2006; Lantz et al., 2002) that emphasize body satisfaction, increases the risk for developing MD. Moreover, male school-aged adolescents who play power sports and engage in weightlifting are at increased the risk of MD development (Cafri et al., 2008; Cafri et al., 2006).

There are a host of other difficulties that research has associated with MD symptoms. Media influence predicts MD symptoms in male adolescents (Cafri et al., 2006), and research

suggests that males exposed to muscular male figures in advertisements will show measurable dissatisfaction with their own bodies (Leit, Gray, & Pope, 2002), and thus may show more symptoms of MD because of their concentration on the ideal level of muscularity, an important symptom of MD (Pope et al., 1997). Research also shows that perfectionism, particularly concern over making mistakes relates to MD symptoms (Ye Rice, & Storch, 2008). Because other research shows that many school-aged adolescents experience OCD symptomatology (Chowdhury, Frampton, & Heyman, 2004; Heyman, Fombronne, Simmons, Ford, Meltzer, & Goodman, 2003), adolescents who experience obsessive-compulsive symptoms and are particularly concerned about making mistakes appear to be at greater risk for MD. Individuals with eating disorders, including MD, and a drive for muscularity also show perfectionist qualities (Buhlmann, Etcoff, & Wilhelm, 2008; Davis et al., 2005; Kuennen & Waldron, 2007; Sassaroli et al., 2008). Further, body dissatisfaction and overall symptoms of MD and Body Dysmorphic Disorder (BDD) are related to low self-esteem, poor self-concept, and depression according to research (Cafri et al., 2006; Chaney, 2008; Ebbeck et al., 2009; Maida & Armstrong, 2005; Olivardia, 2004; Philips et al., 2004). Last, according to research results (Baghurst & Lirigg, 2009; Cole et al., 2003; Kanayama et al., 2006; Olivardia et al., 2000; Olivardia et al., 2004), individuals with MD symptoms commonly use performance-enhancing drugs that include muscle building supplements and/or steroids.

The pilot study for this dissertation *Health and Wellness of Male Student Athlete Participating in High School Sports* (Lividini, 2010) examined adolescent student athletes with MD symptoms. Thus, the pilot attempted to fill gaps in the MD literature by extending the study of this disorder to male adolescents. Because the pilot had a small sample size (n = 13), statistically significant correlations were not found between MD symptoms and self-esteem,

perfectionism qualities, or academic performance measured by GPA. Nonetheless, consistent with previous research (Cafri et al., 2008; Cafri et al., 2006; Ebbeck et al., 2009; Hildebrandt, Schlendt, Langenbucher, & Chung, 2006; Kuennen & Waldron, 2007; Maida & Armstrong, 2005; Olivardia et al., 2004; Olivardia et al., 2000;Wolke and Sapouna, 2008) these relationships were in the predicted directions.

The present was an attempt to substantiate previous research and to better understand MD symptomatology among male adolescent student athletes and its relation to athletic and academic performance as well as media influence, low levels of self-esteem, high levels of perfectionist qualities, and students' perception that it is okay to use performance-enhancing products to add muscle mass.

In the present study, male student athletes on junior varsity and varsity sports teams in high school completed a questionnaire consisting of items that assess MD symptoms, media influence on body image, self-esteem, and perfectionist qualities. Coaches evaluated the students' athletic performance on a rating scale and the researcher collected standardized Regents test grades to assess academic performance. The proposed research was designed to answer the following questions:

- Will male secondary school athletes show symptoms of MD?
- Will MD symptomatology in high school athletes relate to symptoms and influences (i.e., perfectionism, low self-esteem, media influence, and the perception that it is acceptable to use performance-enhancing products to add muscle mass) that research has found in older research participants who have MD?

- Will MD symptomatology in high school athletes predict their athletic and academic performances?

CHAPTER II

Literature Review

This literature review focuses on Muscle Dysmorphia, its relation to eating disorders, its prevalence among male adolescent student athletes, and its relation to type of sports participation and athletic and academic performance as well as obsessive-compulsive symptoms, low levels of self-esteem, and high levels of perfectionist qualities and substance use.

Muscle Dysmorphia (MD) is a pathological preoccupation with muscularity in individuals in which they fear they look too weak or small (Olivardia, 2001). Although the exact prevalence is unknown, it is estimated that several hundreds of thousands of individuals have MD or subclinical symptoms of the disorder, and MD is more common in men (Olivardia, 2007; Pope, Gruber, Choi, Olivardia, & Phillips, 1997) than in women. Formal epidemiological studies are lacking, but estimates indicate that around 5-10 million Americans with commercial gym membership have symptoms of MD (Pope et al., 1997). The prevalence of MD is increasing in the United States and in other regions of the world (Leone, Sedory, & Gray, 2005) such as Canada (Davis, Karvienen, & McCreary, 2005), South Africa (Hitzeroth, Wessels, Zungu-Dirwayi, Oosthuizen, & Stein, 2001), Europe (Cole, Smith, Halford, 2003; Pope, Gruber, Mangweth, Bureau, deCol, Jouvent, & Hudson, 2000; Wolke & Sapouna, 2008), and the South Pacific (Lipinski & Pope, 2002). Little research regarding MD within the school-aged adolescent population exists and academic effects are unknown.

The Diagnostic and Statistical Manual of Mental Disorders – Text Revision (DSM-IV-TR; American Psychiatric Association, 2000) classifies MD as a Body Dysmorphic Disorder (BDD) in which an individual has a preoccupation with an imagined deficit in appearance causing significant distress or impairment in social, occupational, or other important areas of

functioning. This impairment is not a result of another mental disorder (DSM-IV, 2000). The DSM-IV does not outline MD symptoms specifically. Pope et al. (1997), leading researchers in the area of MD, outlined the diagnostic criteria for MD based on DSM-IV criteria for BDD, previous research, and case studies in the area. Pope et al. specifically highlighted features of MD to offer working criteria for the disorder, to facilitate subsequent research in the area, and to allow other investigators interested in this condition to collaborate effectively. Pope et al. outlined the following symptoms: First, a person has a preoccupation with the idea that his body is not sufficiently lean or muscular. Second, the individual meets at least two of the following five criteria: (a) The individual frequently gives up important social, occupational, or recreational activities because of a compulsive need to maintain his workout or diet schedule; (b) the individual avoids situations in which his body is exposed to others or endures such situations with marked distress or intense anxiety; (c) the preoccupation with the inadequacy of body size or musculature causes clinically significant distress or impairment in social, occupational, or other important areas of functioning; and (d) the individual continues to work-out, diet, or use performance-enhancing substances despite knowledge of adverse physical and psychological consequences. Last, (e) the primary focus of the preoccupation and behavior is on being too small or inadequately muscular, but not on being fat, as it is in anorexia nervosa.

Most studies included in this review included only male participants, given the higher incidence of MD among males (Olivardia, 2007; Pope et al., 1997). However, the review also incorporates studies that included females. Olivardia et al. (2000) interviewed 24 male weightlifters with MD and 30 male weightlifters without MD. Researchers placed advertisements in Boston-area gymnasiums offering compensation for interviewing weightlifters aged 18-30 who could bench press their own body weight at least 10 times. To recruit those with MD

symptoms, the advertisements indicated that researchers wanted individuals who were concerned that they looked too small. Researchers then screened the respondents to advertisements by telephone and asked three questions: (a) Did the respondent spend more than 30 minutes a day preoccupied with thoughts of being too small or insufficiently muscular? (b) Did this preoccupation affect his social functioning? and (c) Had he given up enjoyable activities to go to the gymnasium? Those who endorsed all three items were invited to participate as members of the MD group and those who did not endorse any of the items were invited to participate as part of the control group. All participants provided consent for the study.

Olivardia et al. (2000) measured participants' height, weight, and body fat. Further, the researchers asked basic demographic questions and administered the Structured Clinical Interview for DSM-IV-Patient Version (SCID-P; First, Spitzer, Gibbon, & Williams, 1995) to assess current and past history of DSM-IV Axis I disorders. Researchers also asked questions regarding history of steroid use, obsessive-compulsive symptoms, and inquired about symptoms of MD using questions from the SCID-P, the BDD modification of the Children's Yale-Brown Obsessive Compulsive Scale (CY-BOCS; Scahill, Riddle, McSwiggin-Hardin, Ort, King et al., 1997), and the Muscle Dysmorphia Symptom Questionnaire designed by the researchers. Participants also completed the Eating Disorder Inventory (EDI; Garner, Olmstead, & Polivy, 1983), a brief questionnaire to assess exercise behavior, and a questionnaire to evaluate family and childhood environment. Last, researchers questioned participants about any psychiatric disturbances in their first-degree relatives.

Olivardia et al. (2000) found that the mean age of onset of MD in their sample was 19.4 years (*SD* = 3.6). Participants with MD showed prominent pathology as indicated by the findings that 50% reported that they spent more than 3 hours per day thinking about their muscularity;

58% reported “moderate” or “severe” avoidance of activities, places, and people because of their perceived body defect; and 54% reported “little” or “no” control over their compulsive weightlifting dietary regimens. Men with MD reported higher rates of current or past mood disorders, anxiety disorders, and eating disorders than did men in the control group. Forty-six percent of the 24 men with MD reported using steroids, compared to the 7% of men in the comparison group. Participants with MD had significantly greater dissatisfaction with their bodies, need for exercise, and overall MD pathology than did control group participants.

Although Olivardia et al. (2000) studied adult men with MD, they found that the mean age of onset of MD was 19.4 +/- 3.6 years in their sample. Thus, 16-year-old students may demonstrate MD symptoms that may or may not affect their athletic and/or academic performance. Males diagnosed with MD show high body dissatisfaction, preoccupation with how they look, and most exercise frequently and compulsively (Pope et al., 1997). Males with MD also show symptoms of mood and anxiety disorders (Olivardia et al., 2000). These symptoms are problematic at any age, and may be particularly disruptive during the high school years when adolescents undergo substantial developmental changes. Therefore, further research is needed to gain a better understanding of the psychological effects of MD at the high school-age level, particularly among athletes, and its relation to academic performance.

Muscle Dysmorphia and Its Outcomes

Those with symptoms of MD desire for increased muscle mass, thus engage in problematic behaviors such as the use of muscle-enhancing substances that include anabolic steroids (Baghurst & Lirigg, 2009; Cole, Smith, Halford, & Wagstaff, 2003; Kanayama, Barry, Hudson, & Harrison, 2006; Olivardia et al., 2000; Olivardia et al., 2004) and creatine (Davey & Bishop, 2006). Ricciardelli and McCabe (2004) reported that methods to build muscle mass

include the use of anabolic steroids. Less extreme methods include the use of food supplements and protein powders. However, it is imperative to note that the use of a legal substance, such as creatine, may lead to steroid use if desired results are not produced (Metzl, Small, Levine, & Gershel, 2001). Metzl et al. (2001) reported that little is known about the health effects of long-term creatine use, especially among adolescents younger than 18 years old. Although longitudinal side effects of long term use are unknown, creatine is being used by adolescents in middle and high school, most commonly among males, and those participating in football, wrestling, hockey, gymnastics, and lacrosse (Metzl et al., 2001).

Muscle Dysmorphia and Eating Disorders

Muscle Dysmorphia and eating disorders seem to be closely related. Olivardia et al. (2000) found that men with symptoms of MD scored similarly on the Eating Disorder Inventory (EDI) subscales (Garner, Olmstead, & Polivy, 1983) when compared to participants with eating disorders. Further evidence to support the relationship showed that 29% of men with symptoms of MD reported a current or past history of an eating disorder (Olivardia et al., 2000).

Pope, Katz, and Hudson (1993) referred to MD as "Reverse Anorexia Nervosa" because of its similarities to certain characteristics of Anorexia Nervosa. Individuals suffering from Anorexia Nervosa and/or MD show a preoccupation with appearance, thus experience extreme stress and anxiety. Further, individuals with both of these disorders hide their bodies in oversized clothing and also participate in compulsive behaviors including specific eating rituals. Last, people with MD and anorexia engage in self-destructive behaviors. For example, those with MD commonly engage in excessive exercising, use of anabolic steroids, and/or weight lifting whereas anorexics frequently engage in binge eating, excessive dieting, and/or exercise (Olivardia et al., 2000).

Sport Participation

Pope et al. (1997) emphasized that a key component of the MD diagnosis is the individual's preoccupation with his body being insufficiently lean or muscular. Therefore, males who engage in power sports, bodybuilding, and weightlifting may be likely to have MD symptoms because these sports stress muscle development, muscle size, and muscle symmetry, as well as provide an overall stress on body satisfaction associated with these activities (Baghurst & Lirigg, 2009; Cafri, Olivardia, & Thompson, 2008; Cafri, van den Berg, & Thompson, 2006; Lantz, et al., 2002).

Power sports participation is common at the school-aged level. Power sports are "fighting and strength" sports (Endresen & Olweus, 2005, p. 469) that include boxing, weightlifting, wrestling, football, baseball, and track (Cafri et al., 2006; Endresen & Olweus, 2005). Cafri et al. (2006) investigated the relationship between power sports participation and MD symptomatology in adolescent males. The researchers examined levels of risky behaviors related to the pursuit of muscularity and sports participation. Cafri et al. (2006) recruited 299 boys ranging from ages 13 to 18 and administered various questionnaires and rating scales during health education class. Researchers asked for height and weight to determine students' Body Mass Index (BMI). In addition, researchers administered the Pubertal Development Scale (Petersen, Crockett, & Richards, 1988) to assess perceived pubertal growth and the Media Influence Scale for Adolescent Boys (MISAB; Haselhuhn, Thompson, Roehrig, Shroff, van den Berg, Keery et al., 2001) to assess the extent to which boys endorsed an acceptance of media images that promote a muscular appearance. Further, boys completed items that assessed teasing by their father, mother, and peers regarding muscularity as well as the Negative Affect Scale (Watson, Clark, & Tellegen, 1988) to assess negative feelings, the Rosenberg Self-Esteem Inventory (Rosenberg,

1965) to assess self-esteem, the Drive for Muscularity Scale-Body Image Subscale (McCreary, Sasse, Saucier, & Dorsch, 2004) to assess appearance satisfaction related to muscular appearance, and the Muscular Appearance Satisfaction Scale (MASS; Mayville, Williamson, White, Netemeyer, & Drab, 2002). Participants also reported the number of hours per week spent playing football, baseball, wrestling, and track on an organized team. The researchers asked that participants report their frequency of substance use and complete the Dieting to Gain Weight Subscale of the Body Change Inventory (Ricciardelli & McCabe, 2002) to assess behaviors, cognitions, and anxiety related to dieting to gain weight.

Cafri et al. (2006) found that negative affect, acceptance of media images that promote a muscular appearance concerning muscularity, and power sports participation predicted MD symptoms, and 9.8% of adolescent boys in the sample used one or more muscularity enhancing drugs in their lifetime. School-aged males also engage in weightlifting, and males who engage in weightlifting also demonstrate MD symptomatology and show increased body dissatisfaction and functional impairment. Cafri et al. (2008) investigated weightlifters with current symptoms of MD, past MD, and no history of MD. Cafri et al. (2008) recruited 51 participants between the ages of 18-40 from advertisements placed in local area gymnasiums and vitamin/nutrition stores. Advertisements were identical in wording to those described by Olivardia et al. (2000). Researchers asked participants a series of questions to confirm that they met criteria explained in the flyer advertisements. All participants provided written consent.

Cafri et al. (2008) administered the MASS (Mayville et al., 2002) and the Muscle Dysmorphia Inventory (MDI, Rhea, Lantz, & Cornelius, 2004). The MDI is a 25-item questionnaire that assesses eight components of MD: Inadequacy, Preoccupation, Muscularity Drive, Increased Muscularity, Compulsivity, Body Anxiety, Social Sacrifice, and Persistence.

Items are rated on a six-point Likert-type scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*) and higher scores indicate a greater endorsement of MD symptomatology. Experimenters also administered the BDD diagnostic module (First, Spitzer, Gibbon, & Williams, 1997), and the BDD modification of the Yale-Brown Obsessive Compulsive Scale (Y-BOCS; Phillips, Hollander, Rasmussen, Aronowitz, DeCaria, & Goodman, 1997), and the SCID-research version, non-patient edition (First, Spitzer, Gibbon, & Williams, 2002). Researchers also asked for the participants' BMI. Comparisons of MD symptoms were based on evaluating differences between two groups of males: (a) those who currently had MD and (b) a control consisting of those who did not have MD combined with participants who had MD in the past.

Cafri et al. (2008) found that the mean age of onset, in accordance with previous research (Olivardia et al., 2000), was 19.17 years (*SD* = 4.38 years). Participants who had MD were distinct from typical weightlifters because those with MD had significantly more obsessive-compulsive symptoms than controls and thought about their muscle size, checked their appearance in mirrors, and had greater muscle dissatisfaction, bodybuilding dependence, and more functional impairment than did controls. Thus, weightlifters with MD symptoms were more pathological than typical weightlifters. Further, participants with a history of MD revealed higher rates of anxiety disorders (e.g., panic disorder (17%), PTSD (9%), OCD (4%), specific phobia (4%), social phobia (4%) and generalized anxiety disorder (4%)) and mood disorders (e.g., major depressive disorder (65%) and dysthymic disorder (9%)) relative to controls.

Male weightlifters focus on body image; thus, there is a prevalence of MD symptoms among members of this population in addition to anxiety and mood disorders (Cafri et al., 2008). Bodybuilders also emphasize body image, muscle size, and body shape. Nonetheless, bodybuilders stress muscle size and shape more than weightlifters; therefore, bodybuilders

present with more MD symptomatology (Lantz et al., 2002) than do weightlifters. Lantz et al. (2002) investigated the differences in MD symptomatology and prevalence between bodybuilders and power lifters. Bodybuilders are defined as those who are motivated primarily by developing muscle size, body-size symmetry, and muscle shape. Power lifters pursue muscle strength and lift as much weight as possible in a single repetition. Sixty-eight male and female power lifters and 100 bodybuilders participated. Participants averaged 31.68 years of age (*SD* = 6.62). Lantz et al. (2002) sampled power lifters during their national championship meet with permission from their national organization and meet coordinator. Researchers approached the power lifters immediately after participation in the competition and asked participants to complete the MDI (Rhea et al., 2004). Lantz et al. (2002) asked bodybuilders to complete the MDI immediately after a national qualifying competition or after a workout with permission from competition coordinators and gym owners. Authors answered any questions that power lifters or bodybuilders may have had.

The researchers asked all participants to complete the MDI self-report measure to assess behavioral and psychological characteristics associated with MD (Rhea et al., 2004). The MDI consists of the following subscales: body size-symmetry, exercise dependence, supplement use, dietary behaviors, and pharmacological use.

Lantz et al. (2002) found that bodybuilders were significantly more likely to report body-size asymmetry or greater dissatisfaction with their physique, physique protection, dietary behavior, and pharmacological use than were power lifters. Therefore, bodybuilders may engage in more behaviors consistent with MD than do elite-level power lifters. Most important, the MD diagnosis is predominantly based on one's pathological concerns regarding the size and shape of the body (Pope et al., 1997). Thus, bodybuilding as a sport is a better fit within the MD diagnosis

than is power lifting because bodybuilders have a greater focus on how large and muscular they are. Bodybuilders also showed significantly higher use of pharmacological aids than power lifters (Lantz et al., 2002).

Baghurst and Lirigg (2009) further supported the research findings by Lantz et al. (2002) and demonstrated that bodybuilders exhibit more MD symptomatology than weightlifters or football athletes. Baghurst and Lirigg (2009) investigated differences in MD traits between collegiate football players, weight trainers, competitive non-natural bodybuilders, and competitive natural bodybuilders. Researchers recruited 66 male collegiate NCAA Division One football players from a Mid-South university. Baghurst and Lirigg also recruited 65 competitive natural bodybuilders (NBB) and 47 competitive non-natural bodybuilders (NNBB) from established bodybuilding websites and forums. Natural bodybuilders are drug-tested and must pass a polygraph regarding their lack of prohibited drug use; however, non-natural body builders participate in competitions that do not required them to pass a polygraph, nor are they drug-tested. Researchers recruited 115 weight training for physique participants (WTP) from recognized weight training websites and forums. Participants included in the WTP group engaged in weight training to improve their physique and not for health reasons, for athletic performance, for bodybuilding competitions, nor for any other reason (Baghurst & Lirigg, 2009).

Baghurst and Lirigg (2009) asked all participants to complete questionnaires including the Exercise Specific Questionnaire (ESQ) to assess previous and current exercise status and the Demographic Questionnaire (DQ). Participants also completed the MDI (Rhea et al., 2004) to assess characteristics associated with MD. Collegiate football players completed paper-based formats of the surveys posted on specific bodybuilding and weight training websites. The NBB, NNBB, and WTP participants either completed web-based duplicates of the surveys or

researchers emailed prospective participants information and a second email that contained a website link to the study. Researchers informed participants of the purpose of the study to investigate male body image and explained that participation in the study implied consent.

Baghurst and Lirigg (2009) found that the non-natural bodybuilders (NNBB) did not score significantly higher on any subscale of the MDI except for the Pharmacological Use subscale. Therefore, both bodybuilding groups, natural and non-natural, were equally concerned about the traits associated with MD regardless of supposed steroid use among members of the NNBB group. The NNBB and the NBB groups scored significantly higher than those in the weight training for physique group on the Dietary Behavior and Supplement Use subscales demonstrating that those in the WTP group may lack dietary knowledge or do not value nutrition as much as bodybuilders. Results showed no differences between these three groups on the Size/Symmetry subscale. Thus, researchers concluded that each bodybuilding group viewed muscular size and symmetry as equally important. The collegiate football players scored highest on the Physique Protection scale, but lowest on the rest of the subscales of the MDI. Baghurst and Lirigg concluded that athletes were concerned with body image given the demographics of these participants who were heavier, taller, and younger. The colligate athletes also showed high scores on the Pharmacological Use subscale relative to the WTP and NBB groups.

Overall, male participation in power sports, weightlifting, and bodybuilding is correlated with MD (Baghurst & Lirigg, 2009; Cafri et al., 2008; Cafri et al., 2006; Lantz et al., 2002) given the emphasis on body satisfaction, a key component of MD. Those who engage in bodybuilding have a greater inclination toward MD because of bodybuilding's focus on muscle development, muscle size, and symmetry (Baghurst & Lirigg, 2009; Lantz et al., 2002; Pope et al., 1997).

Moreover, male school-aged adolescents who play power sports and engage in weightlifting are at increased the risk of MD development (Cafri et al., 2008; Cafri et al., 2006).

Media Influence

In addition to power sport participation and weightlifting, adolescents' media engagement also increases the prevalence MD symptomatology (Cafri et al., 2006). As stated previously, Cafri et al. (2006) found that media influence and power sports participation predicted MD symptoms in male adolescents aged 13-18 years old. Leit, Gray, and Pope (2002) further supported the influence of media on males' attitudes about their body appearance. They examined the effects of media images on college men's feelings towards their body. Researchers recruited undergraduate college men with a mean age of 19.8 years from a private university to participate in the study and obtained their written consent. Most students were in their first or second year of college. Participants completed a demographic questionnaire and a questionnaire that assessed their magazine reading habits.

Leit et al. (2002) divided participants into an experimental group and a control group. The experimental group viewed 30 slides of advertisements from popular magazines and clothing catalogs that contained 10 neutral slides of humans and 20 slides featuring ideal images of the male body. In the control condition, participants viewed advertisements that contained either no human images or human images that did not focus on the body. The principal investigator and 10 college-aged men rated, on a 7-point Likert scale ranging from 1 (*not at all muscular/attractive/sexually provocative*) to 7 (*extremely muscular/attractive/sexually provocative*), whether or not experimental images would be perceived by most people as being muscular and attractive without being extremely sexually provocative. Three judges rated whether or not participants would perceive neutral images as non-body focused. Researchers

used the images with the highest scores for attractiveness and muscularity for the muscular advertisements and the images with the lowest scores for the neutral advertisements. If judges gave advertisements a mean score of 5 or greater on the sexually provocative dimension, researchers eliminated the images from consideration.

Leit et al. (2002) gave the participants the computerized Somatomorphic Matrix (Pope, Gruber, Mangweth, Bureau, deCol, Jouvent, & Hudson, 2000) test that assessed body image perception. Participants were able to visually adjust pictures of men to make them more or less muscular and more or less fat at the same time. The instrument consists of a 10 X 10 matrix of line drawings of men that vary in body fat percentages, fat-free mass indexes (FFMI), and a muscularity index (Kouri, Pope, Katz, & Olivia, 1995). Researchers asked participants to select the figure that they believed best represented their current body shape, their ideal body shape, the average body shape of men their age, and the body shape most desired by women.

Leit et al. (2002) found that the experimental group displayed a significantly greater discrepancy between the current and ideal FFMI and between the current FFMI and participants' estimate of the average man's FFMI than did the control group. Therefore, Leit et al. suggested that males exposed to muscular male figures in advertisements will show measurable body dissatisfaction, more specifically between the level of muscularity that they perceive themselves to have and the level that they would ideally like to have. Therefore, males that view media male body representations that are muscular and attractive may be more likely to have MD symptoms because of their concentration on the ideal level of muscularity, a key component of MD (Pope et al., 1997). Leit el al.'s sample consisted of college males; thus predictions cannot be generalized to adolescent school-aged males and the media influence on their perceptions of body appearance.

Obsessive Compulsive Disorder

The overall MD diagnosis incorporates obsessive-compulsive behaviors within its symptomatology. Therefore, in addition to power sport participation, weightlifting, and media influence, individuals with features of MD also present with increased incidences of obsessive-compulsive symptomatology (Chandler, Grieve, Derryberry, & Pegg, 2009; Maida & Armstrong, 2005; Wolke & Sapouna, 2008). Estimating the prevalence of OCD symptoms in children and adolescents is extremely difficult because children are secretive about their symptoms and those with subclinical features of OCD are usually not included in prevalence estimates (Cameron, 2007). However, studies have shown that the mean age of onset of OCD is between 8 and 11 years (Chowdhury, Frampton, & Heyman, 2004), the prevalence among individuals ages 5-15 years old is around .25%, and OCD symptomatology increases as children grow older (Chowdhury et al., 2004; Heyman et al., 2003). Therefore, OCD is common among adolescents, thus providing more support for the prevalence of MD within the school-aged population given the relationship between MD and OCD (Chandler et al., 2009; Maida & Armstrong, 2005; Wolke & Sapouna, 2008).

The DSM-IV defines OCD as existing when a person experiences either obsessions or compulsions that fit the following criteria: Obsessions are defined by (a) recurrent and persistent thoughts, impulses, or images that are experienced at some time during the disturbance as intrusive and inappropriate and that cause marked anxiety or distress; (b) the thoughts, impulses, or images are not simply excessive worries about real-life problems; (c) the person attempts to ignore or suppress such thoughts, impulses, or images, or to neutralize them with some other thought or actions; and (d) the person recognizes that the obsession thoughts, impulses, or images are a product of his or her own mind (not imposed from without as in thought insertion).

Compulsions are defined by (a) repetitive behaviors (e.g., hand washing, ordering, checking) or mental acts (e.g., praying, counting, repeating words silently) that the person feels driven to perform in response to an obsession or according to rules that must be applied rigidly, and (b) the behaviors or mental acts are aimed at preventing or reducing distress or preventing some dreaded event or situation; however, these behaviors or mental acts either are not connected in a realistic way with what they are designed to neutralize or prevent or are clearly excessive.

At some point during the course of the disorder, the person recognizes that the obsessions or compulsions are excessive or unreasonable; however, children may not recognize the excess or unreasonableness of their symptoms. The obsessions or compulsions cause marked distress, are time consuming (take more than 1 hour a day), or significantly interfere with the person's normal routine, occupational (or academic) functioning, or usual social activities or relationships. If another Axis I disorder is present, the content of the obsessions or compulsions is not restricted to the other disorder (e.g., preoccupation with food in the presence of an Eating Disorder; hair pulling in the presence of Trichotillomania; concern with appearance in the presence of BDD; preoccupation with drugs in the presence of a Substance Use Disorder; preoccupation with having a serious illness in the presence of Hypochondriasis; preoccupation with sexual urges or fantasies in the presence of a Paraphilia; or guilty ruminations in the presence of Major Depressive Disorder). Last, the disturbance is not due to the direct physiological effects of a substance (e.g., a drug of abuse, a medication) or a general medical condition (DSM-IV, 2000).

Maida and Armstrong (2005) investigated the relationships among symptoms of MD and obsessive-compulsive features and concluded that MD should be placed within the obsessive-compulsive spectrum of disorders. Researchers recruited 106 male participants between the ages

of 18 and 45 from clients at private and university gyms in Pennsylvania and New York. Maida and Armstrong placed signs in and around gym/fitness area entrances that asked for volunteers to compete questionnaires for a study investigating male fitness attitudes. Researchers also visited small gyms in Philadelphia and New York to solicit volunteers and asked gym managers to distribute questionnaires to clients. Randomly ordered questionnaires were placed in postage-paid, self-addressed mailing envelopes. Participants were involved in weight lifting and/or fitness routines and lifted weights four or more times weekly.

Participants completed five questionnaires (Maida & Armstrong, 2005). The first questionnaire was an informational form that included six questions: age range, employment and/or student status, highest level of education attained, marital status, involvement in organized sports, and months/years the participant had been weight training. Participants also completed a questionnaire composed of the Drive for Muscularity Scale (DMS; McCreary & Sasse, 2000). The DMS consists of 15 items ranked on a six-point Likert-type scale from 1 (*always*) to 6 (*never*) and higher scores indicate higher levels of a drive for muscularity. Participants also completed the Muscle Dysmorphia Symptom Questionnaire (Olivardia et al., 2000) that assessed MD symptoms, the severity of MD, and an individual's perception that he is not muscular enough and that bulk should be added to his frame. Further, participants completed the BDD-Y-BOCS (Phillips, et al., 1997) to assess the severity of BDD on a four-point scale. The Brief Symptom Inventory (Derogatis, 1984) was also used to measure tendencies of somatization (SOM), obsessive-compulsive disorder (OCD), depression (DEP), anxiety (ANX), and unrelated disorders such as hostility (HOS), interpersonal sensitivity (IS), paranoid ideation (PI), and psychoticism (Derogatis,1984). Last, participants completed the EDI (Garner et al., 1983) to measure the range of eating disorder characteristics.

Maida and Armstrong (2005) found that 25 % of participants endorsed symptoms of MD, such as a preoccupation with a perceived inadequacy in their muscularity, which caused these individuals to give up important social, occupational, or recreational activities to engage in extensive weightlifting. Individuals were also uncomfortable with and avoided activities where their bodies might be exposed to others. Researchers found a strong positive relationship between MD symptoms and OCD. MD symptoms were moderately related to depression and anxiety as well as perfectionism and body dissatisfaction. No significant relationships were found between MD and interpersonal sensitivity, psychoticism, paranoid ideation, or somatization. Maida and Armstrong unexpectedly found a strong relationship between MD symptoms and hostility. Regression analysis showed that hostility mediated OCD as a powerful predictor of MD in this sample. Maida and Armstrong concluded that the combination of BDD, OCD, body dissatisfaction, and hostility is a powerful predictor of MD.

Chandler, et al. (2009) evaluated how MD related to trait anxiety and obsessive-compulsive symptoms, and their findings lent further support to Maida and Armstrong's (2005) assertion that MD should be part of the obsessive-compulsive spectrum of disorders. Researchers recruited 97 male participants from a mid-sized university with a mean age of 21.75 years. Participants completed a demographic survey that inquired about gym membership, frequency of working out, use of supplements, and BMI. Further, Chandler et al. administered the Speilberger State-Trait Anxiety Inventory (STAI; Speilberger, Gorsuch, & Lushene, 1983) to assess state and trait levels of anxiety. This 40-item self-report assesses both how a person feels at the moment (state anxiety) and how he or she generally feels (trait anxiety). Participants rated items that included "I feel calm" and "I make decisions easily" on a four-point Likert-type scale from 1 (*not at all*) to 4 (*very much so*). Researchers included only the trait anxiety scores in the

analysis because the study focused on long-term characteristics of the participants. Chandler et al. (2009) also used the Social Physique Anxiety Scale (SPAS; Hart, Leary, & Rejeski, 1989) to evaluate body anxiety. The SPAS scale consists of 12 items that participants rated on a five-point Likert-type scale from 1 (*not at all*) to 5 (*extremely*), and higher scores indicate higher levels of social physique anxiety. Researchers also administered an abbreviated Yale Brown Obsessive-Compulsive Scale (YBOCS; Goodman, Price, Rasmussen, & Mazure, 1989) to assess symptoms of OCD. The abbreviated version of the Y-BOCS consists of 10 self-report items for which the participants rank, on a scale ranging from 0 to 4, how much control they perceive themselves having over their obsessions or compulsions. Higher scores on the YBOCS indicated higher levels of obsessive-compulsive features.

Chandler et al. (2009) administered the MDI (Rhea et al., 2004) to assess for symptoms of MD. Participants also completed the DMS (McCreary & Sasse, 2000) to assess a participant's drive for muscularity. Last, the researchers administered the Male Body Attitudes Scale (MBAS; Tylka, Bergeron, & Schwartz, 2005) to assess attitude about body image and body focus. The MBAS consists of 29 items, each rated on a seven-point Likert-type scale from 0 (*never*) to 6 (*always*) and lower scores indicate higher levels of body focus and negative body opinion.

Chandler et al. (2009) found strong relationships between trait anxiety, social physique anxiety, obsessive-compulsive features, and MD symptoms. Trait anxiety had a strong and predictive relationship with overall MD symptoms as shown in the relationship between the scores of the STAI and the MDI. Obsessive-compulsive features were strongly related to and predictive of various factors of MD including a strong predictive relationship between obsessive-compulsive symptoms and body focus. Researchers also revealed that obsessive-compulsive features correlated strongly with predicted social physique anxiety. The authors concluded that a

predisposition towards obsessive thinking and compulsive behaviors when combined with other factors related to MD, such as sports participation and media influence, leads to an expression of the obsessions and compulsions through body preoccupation. Overall, Chandler et al.'s (2009) findings provide further support for Maida and Armstrong's (2005) determination that MD should be placed within the obsessive-compulsive spectrum of disorders given the strong relationship between MD symptomatology and obsessive-compulsive features.

Wolke and Sapouna (2008) demonstrated further support for the relationship between MD and OCD symptoms in male bodybuilders in accordance with previous research (Chandler et al., 2009; Maida & Armstrong, 2005). They also demonstrated the possible prevalence of MD and OCD symptomatology in the school-aged population because their sample population ranged in age from 16 to 62 years old. Wolke and Sapouna investigated the relationship of MD with childhood bullying victimization and mental health problems in a nonclinical sample of male bodybuilders. They recruited 100 male bodybuilders, ages 16 to 62 years, from 10 gymnasiums in South England and South Wales. Researchers obtained informed consent and gave participants a high protein bar for their participation.

Wolke and Sapouna (2008) asked participants to complete a series of questionnaires. Participants completed the MDI (Rhea et al., 2004) to assess MD symptoms, the Rosenberg Global Self-Esteem Scale (RGSS; Phillips et al., 2004; Rosenberg, 1965) to assess self-esteem, an adapted bullying questionnaire to assess victimization, and a questionnaire with three subscales: depression, anxiety, and obsessive compulsive. Researchers calculated a global psychopathology scale from the depression, anxiety, and obsessive-compulsive scales by adding together the total scores; thus, high values indicated greater psychopathology. Participants also self-reported weight, height, and BMI. Wolke and Sapouna found that greater MD

symptomatology was significantly associated with greater psychopathology, specifically depressive symptoms, obsessive-compulsive symptoms, anxiety, and lowered self-esteem. Further, bully victimization scores were significantly correlated with greater psychopathology and lowered self-esteem.

In general, individuals with MD symptoms experience features of OCD (Chandler et al., 2009; Maida & Armstrong, 2005; Wolke & Sapouna, 2008). Research shows that adolescents often show obsessive-compulsive behaviors (Chowdhury et al., 2004; Heyman et al., 2003), thus children and adolescence are at risk for experiencing MD symptomatology. Heyman et al. (2003) investigated the prevalence of OCD in children between the ages of 5 and 15 years. Researchers used the Child Benefit Register (CBR), on behalf of the Office for National Statistics (ONS) survey team, as a sampling frame to select children aged 5-15 years throughout England, Wales, and Scotland, and 10,438 children were eligible for interview. Trained interviewers interviewed the parents of children using the Developmental and Well-Being Assessment (DAWBA; Goodman, Ford, Richards, Gatward, & Meltzer, 2000) a combined structured and unstructured interview. The DAWBA generates diagnoses based on DSM-IV and the Tenth Revision of the International Classification of Diseases (ICD-10; World Health Organization, 1993) through a computer program that clinicians reviewed. Researchers also included a teacher questionnaire and a screening question to detect obsessive-compulsive symptoms.

Heyman et al. (2003) also administered the parent, teacher, and youth extended versions of the Strength and Difficulties Questionnaire (SDQ; Goodman, 1999) to screen for psychiatric symptoms and the impact of psychiatric symptoms. If children obtained a high score on the emotional sub-scale of the SDQ, researchers asked parents in more detail about OCD symptoms. Heyman et al. also administered the British Picture Vocabulary Scale (BPVS-II; Dunn, Whetton,

& Burley, 1997) and reading and spelling tests from the British Ability Scales (BAS-II; Elliott, Smith, & McCulloch, 1996).

Heyman et al. (2003) found that 25 of the 10,438 participants ultimately included in the survey received a diagnosis of OCD. Thus, the overall prevalence of OCD was 0.25%. However, results showed an exponential increase in the rate of OCD as age increased. OCD prevalence rates for the different age ranges showed ages 5-7 years at 0.026%, 8-10 years at 0.14%, 11-12 years at 0.21%, and 13-15 years at 0.63%. Overall, Heyman et al. concluded that OCD is common throughout childhood, increases with age, and is particularly present during adolescence.

Chowdhury et al. (2004) further investigated OCD symptomatology and found supporting evidence that many adolescents experience OCD. Researchers carried out a retrospective case note and database analysis of patients referred to the Maudsley Hospital children's OCD clinic between April 1998 and December 1999. Researchers asked the male and female patient and/or family members when he/she first noticed the presence of obsessions or compulsions to determine the age of onset of OCD. Chowdhury et al. evaluated the severity of OCD using the CY-BOCS (Scahill, et al., 1997), a 10-item, clinician-rated, semi-structured instrument. They also collected information in regard to participants' gender, age at assessment, family history, co-morbid diagnoses, and previous treatment.

Chowdhury et al. (2004) found that 74% of the patients fulfilled criteria for OCD. The mean age at assessment was 13.1 years and the mean duration of symptoms prior to assessment was 3.1 years. Therefore, they estimated that OCD symptomatology begins around the age of 10 years. Thirty percent of the children assessed who showed severe OCD symptomatology according to the CY-BOCS assessment were 12-18 years old.

Chowdhury et al.'s (2004) findings coincide with previous research (Heyman et al., 2003) to show that many school-aged adolescents experience OCD symptomatology. Adolescents who experience obsessive-compulsive symptoms are at greater risk for MD given the comorbidity of the two disorders established by previous studies (Chandler et al., 2009; Maida & Armstrong, 2005; Wolke & Sapouna, 2008).

Perfectionism

In addition to obsessive-compulsive symptoms, individuals with eating disorders, including MD, and a drive for muscularity are also more likely to experience perfectionist qualities (Buhlmann, Etcoff, & Wilhelm, 2008; Davis, Karvinen, & McCreary, 2005; Kuennen & Waldron, 2007; Sassaroli, Lauro, Ruggiero, Mauri, Vinai, and Frost, 2008) specifically related to concern over making mistakes (Buhlman et al., 2008; Sassaroli et al., 2008). The high incidence of perfectionist qualities, particularly sensitivity to making mistakes in school-aged individuals diagnosed with OCD (Ye et al., 2008) suggests that adolescents with MD symptomatology will also show increased perfectionist qualities.

Davis et al. (2005) investigated perfectionism, among other factors, and its relationship to men's drive for muscularity, a characteristic of MD (Pope et al., 1997). Davis et al. (2005) recruited 100 men between the ages of 18 and 30 via advertisements posted at a Canadian university asking for volunteers for a "short psychology study" (pg. 352). All participants provided informed consent. Experimenters administered a series of questionnaires 1:1 in a laboratory setting, measured height and weight after individuals completed the questionnaires, and provided participants with a small stipend for their participation.

Davis et al. (2005) administered the following questionnaires: DMS (McCreary & Sasse, 2000) to assess one's drive for muscularity, the Narcissism Personality Inventory (NPI; Raskin &

Terry, 1988) to assess narcissism, the 24-item N scale of the Eysenck Personality Questionnaire-Revised (EPQ-R; Eysenck & Eysenck, 1991) to assess neuroticism, the 15-item Self-Oriented sub-scale of the Multidimensional Perfectionism Scale (Frost, 1990) to assess perfectionism, and the 12-item Appearance Orientation and the 13-item Fitness Orientation sub-scales, respectively, of the Multidimensional Body Self-Relations Questionnaire (MBSRQ; Cash, 1994) to assess focus on appearance and fitness.

Davis et al. (2005) found that, except for the measure for narcissism, all self-report measures were positively and significant correlated with drive for muscularity. Therefore, men who are easily made anxious, have strong perfectionistic tendencies, and are focused on their appearance and body fitness report the highest drive for muscularity. Further, Davis et al. discovered that neuroticism, perfectionism, fitness orientation, and appearance orientation were significant predictors of the drive for muscularity.

Bulmann, Etcoff, and Wilhelm (2008) evaluated facial physical attractiveness ratings and perfectionistic thinking among individuals with BDD, OCD, and a control group. Male and female participants included 19 individuals in the BDD group, as determined by the Structured Clinical Interview for the DSM-IV (SCID, First et al., 1995), who had one or more of the following concerns: facial skin, hair, eyes, or shape of nose. The OCD group consisted of 21 participants who met criteria for OCD as determined by the SCID (First et al., 1995). OCD group participants had the following symptoms: contamination fears, aggressive obsessions, fear of making mistakes, obsessions about guilt, religious obsessions, rumination, checking, hand washing, counting compulsions, hoarding, and rereading. The control group consisted of 21 participants for whom SCID interviews determined the absence of psychiatric history.

Bulmann et al. (2008) assessed participants individually during two appointments. During the first appointment, participants read and signed the informed consent prior to the SCID interview and completed the BDD Modification of the Y-BOCS (BDD-YBOCS; Goodman et al., 1989). Researchers then took photographs of participants. At the second appointment, participants experienced a short practice session during which experimenters presented six facial photographs, one from each category including attractive, average, and unattractive, as well as their own photographs. Four Independent Evaluators (IEs) classified the photographs in regard to attractiveness prior to the study and established inter-rater reliability. Experimenters asked participants to rate each photograph in terms of its physical attractiveness on a Likert-scale from 1 (*very unattractive*) to 7 (*very attractive*). Experimenters emphasized that participants should rate the photographs in terms of how attractive they personally believed the individuals displayed in the photographs were and not according to what they believed that other people might think. The experimenter left the room when participants completed the tasks. Participants also completed the Beck Depression Inventory (BDI: Beck & Steer, 1987) to assess severity of depression and the Multidimensional Perfectionism Scale (MPS; Frost, et al., 1990) to assess perfectionism qualities. Experimenters asked participants if they would agree to have their photograph rated by IEs in terms of their physical attractiveness. Then they paid and debriefed the participants.

Bulmann et al. (2008) found that participants with BDD and OCD rated themselves with higher levels of perfectionism than did control group participants. Specifically, participants with BDD and OCD exhibited more concerns over mistakes than controls. The Concern over Mistakes subscale of the MPS shows negative reactions to imperfections, a tendency to interpret imperfections as equivalent to failure, and a tendency to believe that one will lose the respect of

others as a result of imperfection. Therefore, Bulmann et al. concluded that imperfections of appearance might be at the root of perfectionism in individuals with BDD and OCD. Further, participants with OCD and BDD showed higher levels of "doubting of action" than control participants on the FMPS. Bulmann et al. concluded that individuals with BDD and/or ODD may believe that certain actions need to be done very carefully and repeatedly to either hide or improve appearance and these actions may represent compulsions.

Sassaroli et al. (2008) also investigated perfectionism qualities among patients with major depression, OCD, and eating disorders compared to controls and found similar evidence that Concern over Mistakes was higher within the groups with disorders compared to controls. Sassaroli et al. included 37 individuals with OCD, 25 individuals with major depression, and 30 individuals with eating disorders in their study. Participants were the average age of 32.7 years. Psychologists trained in cognitive therapy interviewed participants with the Structured Clinical Interview for DSM-IV (SCID-I, First et al., 1997) to determine diagnoses. Experimenters recruited individuals with OCD and eating disorders from the "Studi Cognitivi" Psychotherapy Center of Milano and individuals with major depression from the mood disorders unit of the Policlinico Ospedale Maggiore di Milano. Participants in the eating disorder group had diagnoses of Bulimia or Anorexia Nervosa. Experimenters recruited participants in the control group from the "Studi Cognitvi" Psychotherapy School of Milano and the "Michelin" form in Cuneo. Psychologists also administered the MPS (Frost et al., 1990), which was translated into Italian, and the Pure Personal Standards subscale (DiBartolo, Frost, Chang, La Sota, & Grills, 2004) to all participants.

Sassaroli et al. (2008) found that all three clinical groups scored significantly higher than controls on the Concern over Mistakes subscale of the MPS. Further, the group with eating

disorders scored significantly higher on the Concerns over Mistakes subscale than the group with OCD and the group with major depression. The OCD and major depression groups did not differ from one another on the Concern over Mistakes subscale. Therefore, the authors concluded that patients with eating disorders are significantly more concerned over making mistakes than patients with OCD or major depression.

Perfectionism qualities, specifically one's concern over making mistakes, are more prevalent among individuals with eating disorders than controls (Sassaroli et al., 2008), and also present among those with MD symptomatology (Bulmann et al., 2008). Kuennen and Waldron (2007) investigated the relationship between MD, a type of BDD, and perfectionism.

Kuennen and Waldron (2007) recruited 49 participants from a male-dominated gym who engaged in resistance training. Participants completed a variety of surveys, including a demographic questionnaire. Researchers recruited participants by posting flyers around the gym facility. All individuals consented to participate. Participants ranged in age from 20 to 59 years. Participants completed the MDI (Rhea et al., 2004) to assess MD symptoms, the Narcissistic Personality Inventory (NPI; Emmons, 1984) to assess narcissistic behaviors, the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1989) to assess self-esteem, and MPS (Frost et al., 1990) to assess perfectionism qualities. Students completed various questionnaires at home or onsite, and after completion, researchers provided them with debriefing forms that outlined MD, provided references for learning more about the topic, and provided a list of telephone numbers of counselors for use if participants were concerned about their own health habits.

Kuennen and Waldron (2000) found a direct relationship between the exercise dependence subscale of the MDI and perfectionism. Perfectionism qualities are prevalent among individuals with eating disorders, including MD, and those with OCD symptomatology. One's

concern over making mistakes is most apparent among those with OCD and eating disorder symptomatology (Buhlmann et al., 2008; Kuennen & Waldron, 2007; Sassaroli et al., 2008).

Ye, Rice, and Storch (2008) further investigated sensitivity to mistakes, a dimension of perfectionism, symptoms of OCD and depression, and peer relationships among youth diagnosed with OCD. Ye et al. included 31 children aged 7-18 from a clinic as participants in the study. Board-certified child psychiatrists made diagnoses using the CY-BOCS (Scahill et al., 1997) results, clinical interviews, and responses to other measures. Licensed clinical psychologists also confirmed diagnoses of OCD. Experimenters excluded individuals who had been diagnosed with mental retardation or a psychotic disorder or were unable to read the questionnaire packets.

Ye at al. (2008) asked participants to complete questionnaires during regularly scheduled appointments at the clinic. Experimenters gained informed consent from the child and parent. Experimenter also interviewed parents for demographic information that included age and gender. Children completed the Children's Depression Inventory-Short Form (CDI-S; Kovacs, 1985) to assess depressive symptoms, the Asher Loneliness Scale (ALS; Asher, 1985) to assess feelings of loneliness and social dissatisfaction, McCloskey's Peer Relationship Scale (MPRS; McCloskey & Stuewig, 2001) to assess the quality of a child's primary friendships, the Schwartz Peer Victimization Scale (SPVS; Schwartz, Farver, Change, & Lee-Shin, 2002) to assess overt and relational forms of peer aggression, and the Adaptive-Maladaptive Perfectionism Scale (AMPS; Rice, Kubal, & Preusser, 2004) to assess dimensions of perfectionism such as sensitivity to mistakes, contingent self-esteem, compulsiveness, and need for admiration. The experimenter administered the CY-BOCS to parents and children together.

Ye et al. (2008) found that sensitivity to mistakes within the perfectionism scale was the only significant predictor of OCD symptoms. In other words, greater concerns about mistakes

were associated with more obsessive-compulsive symptoms consistent with previous research (Buhlmann et al., 2008; Sassaroli et al., 2008).

In summary, research shows that perfectionism, particularly concern over making mistakes, and OCD are related (Ye et al., 2008) and those with eating disorders, including MD, and a drive for muscularity also show perfectionist qualities (Buhlman et al., 2008; Davis et al., 2005; Kuennen & Waldron, 2007; Sassaroli et al., 2008). Because other research shows that many school-aged adolescents experience OCD symptomatology (Chowdhury et al., 2004; Heyman et al., 2003) and because of the comorbidity of MD and OCD (Chandler et al., 2009; Maida & Armstrong, 2005; Wolke & Sapouna, 2008), adolescents who experience obsessive-compulsive symptoms appear to be at greater risk for MD and will likely show perfectionist qualities.

Self-Esteem and Depression

In addition to perfectionist qualities, individuals with MD symptomatology also experience low self-esteem (Chaney, 2008; Olivardia et al., 2004; Philips, Pinto, & Jain, 2004), depression (Wolke & Sapouna, 2008; Maida & Armstrong, 2005), and negative affect (Cafri et al., 2006); Ebbeck et al., 2009).

Olivardia et al. (2004) investigated the relationship between body image, body fat and muscularity, self-esteem, depression, and eating disorder symptoms among male college students. Researchers asked female participants to provide assessments of men. Researchers visited various college classes and recruited 154 participants aged 18-30 years with advertisements. The height, weight, and body fat measurements were taken for all participants and their fat-free mass index (FFMI; Kouri et al., 1995) was also calculated. The FFMI is an

objective measure of an individual's degree of muscularity calculated by considering ones' height, weight, and body fat.

Olivardia et al. (2004) measured body image perceptions using the Somatomorphic Matrix (SMM; Gruber, Pope, Borowiecki, & Cohane, 2000). A collection of photographs of various levels of body fat and muscularity and measurements of their height, weight, and body fat were taken. FFMI's were calculated. A graphic artist used the photographs as a guide to prepare 100 body drawings that represented 10 levels of fat and 10 levels of muscularity. The researchers presented participants with a median body image and they were told to click on one of the four buttons on the right side of the screen to make the image more or less fat and more or less muscular. Olivardia et al. asked participants to make four choices: (a) "Choose the image that best represents your body" (perceived image); (b) "Choose the image that represents the body that you ideally would like to have"; (c) "Choose the image that represents the body of an average person of your age and sex" (average image); and (d) "Choose the image that represents the body most desired by the opposite sex" (pg. 113). Females had been asked to assess and choose the male body that they preferred most prior to SMM administration to the males. Olivardia et al. calculated several indices from the SMM for each participant including fat exaggeration, muscle belittlement, fat displeasure, and muscle displeasure. Researchers asked females to "Choose the male body that you find most attractive" (pg. 114) and presented with the same male computer images as the men.

Olivardia et al. (2004) measured depression using the Beck Depression Inventory (BDI; Beck & Steer, 1987) and assessed eating disorder symptoms and attitudes and body dissatisfaction using the EDI (Garner et al., 1983). Researchers collected demographic information from the males using the Demographic/Family/Childhood Questionnaire (Finkelhor,

1979) and a brief computer questionnaire for the females. Olivardia et al. assessed exercise behavior and attitudes as well as anabolic steroid use using the Confidential Exercise Behavior Survey (Johnson & Love, 1984). Self-esteem was measured with the RSES (Rosenberg, 1979).

Olivardia et al. found that college men displayed body dissatisfaction, a factor of MD (Pope at al., 1997). Men perceived themselves to be slightly fatter than their actual body fat measurements and more muscular than their measured muscularity. The ideal body for male participants was a mean of 25 pounds more muscle than their actual muscularity and 8 pounds less body fat then their actual levels of fat. Moreover, the men chose a perceived female ideal of the male body that was significantly more muscular and leaner than what women actually chose. The men's ideal body was significantly more muscular and less fat than what men judged to be the body of an average man of the same age.

Olivardia et al. (2004) also found that muscle belittlement, a type of body dissatisfaction, was positively correlated with depression. Further, self-esteem was correlated with many body dissatisfaction variables such as muscle displeasure, muscle belittlement, the Body Dissatisfaction scale of the EDI (Garner et al., 1983), not liking one's body, dissatisfaction with the way one's body is proportioned, feeling fat, and feeling out of shape, all characteristics of individuals who suffer from MD (Pope et al., 1997). Male unhappiness and discontent with body image, features of MD (Pope et al., 1997), are correlated with depression and low self-esteem substantiating previous research in which Maida and Armstrong (2005) found that MD symptoms were moderately related to depression and Wolke and Sapouna (2008) showed that MD symptoms are associated with lower self-esteem in males.

Chaney (2008) also investigated the relationship between MD and self-esteem. Chaney (2008) studied psychosocial factors contributing to MD among gay and bisexual men. The

experimenter distributed questionnaires to 314 participants, ages 18-63, at a gay pride festival. Male attendees walked past the booth and picked up informed consents and questionnaires displayed on clipboards. Participants gave written consent and sat at a table to complete the questionnaires. Questionnaires included the MASS (Mayville et al., 2002), the RSES (Rosenberg, 1965), and the UCLA Loneliness Scale (ULS, version 3; Russell, 1996), which assesses the degree of loneliness experienced by individuals. Chaney (2008) found that MD was negatively correlated with self-esteem and that men who reported high symptoms of MD reported significantly lower self-esteem compared to men who reported moderate and low MD symptoms. Self-esteem was also negatively correlated with loneliness.

Phillips, Pinto, and Jain (2004) further substantiated findings that body dissatisfaction and MD are associated with low self-esteem (Chaney, 2008; Olivardia, 2004) and showed that poorer self-esteem was correlated with more severe BDD and depression. Experimenters recruited 93 male and female participants with the mean age of 32.1. Participants were referred to the clinical research program for evaluation and/or treatment of BDD. Participants completed the RSES (Rosenberg, 1965).

Experimenters interviewed participants with the Structured Clinical Interview for DSM-III-R (SCID-P; Spitzer, Williams, Gibbon, & First, 1992) and diagnosed BDD with a semi-structured SCID-like diagnostic instrument based on DSM-IV BDD criteria (Philips, Atala, & Pope, 1995). Participants also completed the BDD-YBOCS (Philips et al., 1997). Experimenters evaluated delusionality (i.e., insight) of appearance-related beliefs with the clinically administered Brown Assessment of Beliefs Scale (BABS; Eisen, Philips, Baer, Atala, & Rasmussen, 1998). Last, experimenters administered the Hamilton Depression Rating Scale (HAM-D; Hamiliton, 1960) to assess the severity of depressive symptoms. Participants

completed the RSES and other measures at the study baseline before Fluoxetine treatment. Those in the Fluoxetine treatment study also completed the RSES and experimenters evaluated them with the BDD-YBOCS and the HAM-D when the study terminated.

Philips et al. (2004) found that self-esteem was significantly correlated with more severe BDD, greater delusionality or poorer insight, and more severe depressive symptoms. After the 12-week fluoxetine trial, there was a treatment effect for the medication on BDD severity, Self-Concept, and Negative Affect (Self-Esteem).

As described earlier, Cafri et al. (2006) also found that negative affect predicted MD symptoms in adolescents. Ebbeck et al. (2009) further investigated the relationship between MD symptoms and self-concept and negative affect. Researchers recruited 423 male and female college students from a Fast Fitness class based in the student fitness center and a weight training class. Students received class credit for participation. The sample consisted of 183 female students and 103 male students aged 18-50 years old. Most male students engaged in physical fitness.

Ebbeck et al. (2009) asked participants to complete various questionnaires. Participants completed the self-worth subscale of the Adult Self-Perception Profile (Messer & Harter, 1986) to measure self-esteem as well as two subscales from the Physical Self-Perception Profile (Fox, 1990). Depression was measured with the BDI (Beck, Steer, & Garbin, 1988). Participants completed the Social Physique Anxiety Scale (Hart et al., 1989) to assess the amount of anxiety that people experience when others observe or evaluate their bodies. Muscle Dysmorphia symptoms were measured with the revised version of the BDD-YBOCS (Olivardia et al., 2000) and the MDI (Rhea et al., 2004).

Ebbeck et al. (2009) found that MD symptoms accounted for a significant amount of variance in the sets of self-conception and negative affect variables. Thus, self-conceptions and negative affect may be consequences that result from MD. The relationship between negative affect variables and MD was stronger than the relationship between the set of self-conceptions and MD. Therefore, authors concluded that negative affect may be directly related to MD and self-esteem is indirectly related to MD.

In general, body dissatisfaction and overall symptoms of MD and BDD are related to low self-esteem, poor self-concept, and depression according to research (Cafri et al., 2006; Chaney, 2008; Ebbeck et al., 2009; Maida & Armstrong, 2005; Olivardia, 2004; Philips et al., 2004).

Performance-Enhancing Drugs

Many individuals with symptoms of MD use performance-enhancing drugs, including steroids (Baghurst & Lirigg, 2009; Cole, Smith, Halford, & Wagstaff, 2003; Kanayama, Barry, Hudson, & Harrison, 2006; Olivardia et al., 2000; Olivardia et al., 2004) and creatine (Davey & Bishop, 2006). Ricciardelli and McCabe (2004) reported that methods to build muscle mass include the use of anabolic steroids, but less extreme methods include the use of food supplements and protein powders. The use of a legal substance, such as creatine, may lead to steroid use if desired results are not produced (Metzl, Small, Levine, & Gershel, 2001). Metzl et al. (2001) reported that little is known about the health effects of long-term creatine use, especially among adolescents younger than 18 years-old. However creatine is being used by adolescents in middle and high school, most commonly among males, and those participating in football, wrestling, hockey, gymnastics, and lacrosse (Metzl et al., 2001).

As mentioned earlier, Olivardia et al. (2000) found that 46% of college men with MD reported using steroids, compared to the 7% of college men in a control comparison group.

Olivardia et al. (2004) found that 27% of college men used over-the-counter muscle-building supplements or anabolic steroids and displayed body dissatisfaction, a factor of MD (Pope at al., 1997). Baghurst and Lirigg (2009) found that non-natural bodybuilders (NNBB) scored higher than natural body builders (NBB) and weight training for physique individuals (ETF) on the Pharmacological Use subscale of the MDI and both bodybuilding groups, natural and non-natural, were equally concerned about the traits associated with MD. Steroid use produces negative health and psychological effects for individuals (Pope & Katz, 1994).

Cole, Smith, and Halford (2003) further provided support for the use of performance enhancing drugs among individuals with MD symptomatology. Cole et al. (2003) investigated anabolic-androgenic steroid (AAS) use among bodybuilders and its relation to reverse anorexia, a disorder synonymous with MD. Reverse anorexia, the previous term used for MD, is used for individuals who perceive they are too small and/or insufficiently muscular and have a chronically distorted perception of their own size (Pope, Katz, & Hudson, 1993) like individuals with MD (Pope et al., 1997). Experimenters randomly recruited 137 male participants from four gyms and a syringe exchange and separated them into four groups; (a) cardiovascular; (b) body builders; (c) body builders who had used AAS in the past; (d) body builders who were currently using AASs. Participants in the cardiovascular group exercised regularly, but not to enhance body mass. Participants in the body builders group exercised in order to increase bodyweight. Participants in the body builders group who had used AAS in the past used AAS over 3 months prior to the study in order to remove withdrawal effects and participants in the body builders group who were currently using AASs used at the time of the study or within the previous 3 months intermittently. Participants self-reported AAS use.

Cole et al. (2003) administered various questionnaires to participants including a modified version of the EDI (Garner et al., 1983), the severity of dependence scale (SDS; Gossop et al., 1995) to rapidly assess severity of dependence for a wide range of drugs, and a self-report questionnaire developed by the authors that consisted of questions about socio-demographics, body weight, height, lowest weight as adult, ideal weight, and controlled drug use. Experimenters computed BMIs based on self-reported weight and height and gained verbal informed consent from participants.

Cole et al. (2003) found that AAS users scored higher on the modified EDI than participants in the cardiovascular and body-building groups. Thus, experimenters concluded that there is an association between AAS use and symptoms of reverse anorexia, now known as MD (Pope et al., 1997). Further, Cole et al. found a positive correlation between scores on the SDS for AAS users and the EDI for participants currently using AAS. Therefore, Cole et al. concluded that individuals with symptoms of reverse anorexia may be more likely to be dependent on AAS.

Cole et al.'s (2003) findings suggest that steroid use is prevalent among individuals with MD symptomatology. Kanayama, Barry, Hudson, and Pope (2006) further supported findings that MD is related to AAS use. Kanayama et al. (2006) assessed 89 heterosexual men who lifted weights from a previous study (Kanayama, Pope, Cohane, & Hudson, 2003) from advertisements in gymnasiums and sport supplement stores in Massachusetts and Florida. Experimenters placed participants in two groups: AAS users and nonusers. All participants provided informed consent. The mean age for users was 20.3 years and the mean age for nonusers was 30.1 years. Kanayama et al. administered a verbal interview and a package of questionnaires that assessed demographic

information, athletic history, psychiatric history, history of licit and illicit drug use, and various psychological ratings.

Psychological ratings included the RSES (Rosenberg, 1979), a modified version of the EDI (Garner et al., 1983), and the Male Role Attitudes Scale (Pleck, Sonenstein, & Ku, 1993) to assess masculine ideology. Last, experimenters included three yes-no items from an unpublished "muscle dysmorphia questionnaire" of their own design. Questions included: (1) "Are you sometimes preoccupied that you are too small and that you need to get bigger?"; (2) "Have you ever worn heavy sweatshirts in the summer or refused to take your shirt off in public for fear that someone may think that you are too small?"; (3) "Do you find yourself giving up enjoyable activities because of this preoccupation?" (p. 699).

Kanayama et al. (2006) found that AAS users scored significant higher than nonusers on the EDI and on the Male Role Attitudes Scale. Further, AAS users were more likely to report preoccupations that they were too small and needed to get bigger, did not allow their bodies to be seen in public, and gave up pleasurable activities because of body-appearance concerns on the MD scale.

Individuals with MD who use performance-enhancing drugs, such as anabolic-androgenic steroids, may experience psychological and health-related difficulties (Pope & Katz, 1994). Pope and Katz (1994) investigated the psychiatric and medical effects of steroid use and compared 88 male athletes who were using steroids with 68 non-users. Researchers recruited participants from advertisements in four gymnasiums in Boston, Massachusetts and Los Angeles, California, administered the Structured Clinical Interview for DSM-III-R (SCID: Spitzer et al., 1992), interviewed participants regarding their medical history, and performed physical examinations. Steroid users had lifted weights for a longer period of time than nonusers.

Pope and Katz (1994) found that steroid users showed health concerns such as more frequent gynecomastia, decreased testicular size, and elevated ratios of total cholesterol-high density lipoprotein ratios than nonusers. Twenty-three percent of users displayed major mood syndromes such as mania, hypomania, and major depression. Participants who used steroids displayed mood disorders during exposure significantly more frequently than nonusers.

In general, individuals with MD symptoms commonly use performance-enhancing drugs that include muscle building supplements and/or steroids according to research (Baghurst & Lirigg, 2009; Cole, Smith, Halford, & Wagstaff, 2003; Kanayama, Barry, Hudson, & Harrison, 2006; Olivardia et al., 2000; Olivardia et al., 2004). The negative effects of anabolic-androgenic steroid use include major mood disturbances and health-related issues (Pope & Katz,1994).

Treatment for Muscle Dysmorphia

Currently, there are no empirically validated treatments for Muscle Dysmorphia (Olivardia, 2001); however, researchers have investigated effective treatments for Body Dysmorphic Disorder (Philips, Dwight, & McElroy, 1998; Rosen, Reiter, & Orosan, 1995; Wilhelm, Phillips, Fama, Greenberg, & Steketee, 2011) of which MD is a subtype (DSM-IV-TR; American Psychiatric Association, 2000), which provide clinicians with treatment frameworks to use with individuals with MD (Olivardia, 2001).

Individuals with BDD have benefited from Cognitive Behavior Therapy (CBT) according to research studies (Philips et al., 1998; Wilhelm et al., 2011). Wilhelm et al. (2011) piloted a modular cognitive behavioral therapy (CBT) for Body Dysmorphic Disorder (BDD). Researchers recruited 12 participants, 7 females and 5 males via flyers and brochures posted in the community and sent to clinicians for dissemination as well as website references. Participants had to be diagnosed with DSM-IV BDD to be included in the study based on the Structured

Clinical Interview for DSM-IV (SCID-P; First et al., 1995) and show symptoms of at least moderate severity on the Yale-Brown Obsessive Compulsive Scale Modified for Body Dysmorphic Disorder (BDD-YBOCS; Philips et al., 1997) as part of an in-person evaluation. Participants mean age was 32.2 years. Researchers excluded individuals who had received CBT for greater than 10 sessions previously and those who began psychotrophic medication less than 2 months before the evaluation. Participants agreed to not change medication during the course of the study. Participants' primary appearance concerns consisted of hair, skin, body shape/size, and height.

Drs. Wilhelm, Philips, or Steketee delivered the CBT treatment in individual, 60-minute sessions, twice weekly for four weeks and once weekly thereafter. Researchers randomized participants to one of two treatment lengths: 18 sessions or 22 sessions to determine if lengthier therapeutic treatment increased progress. Wilhelm et al. (2011) assessed therapeutic progress and related symptoms at baseline, post-treatment, and 3- and 6-month follow-ups. Researchers used the BDD-YBOCS (Philips et al., 1997) to measure BDD severity, the Clinical Global Impression Scale (Guy, 1976) to assess overall symptom improvement, the Brown Assessment of Beliefs Scale (BABS; Eisen et al., 1998) to assess delusionality of BDD beliefs, the Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996) to measure depressive symptoms, and the Clinical Satisfaction Inventory (CSI; McMurtry & Hudson, 2000). The main components of the treatment included Psychoeducation and Case Formulation, Cognitive Restructuring, Exposure and Ritual Prevention, Mindfulness/Perceptual Retraining, Relapse Prevention, and therapist-selected modules based on the specific problems of the patient such as skin picking and hair pulling, muscularity and shape/weight, cosmetic treatment, and mood management.

Wilhelm et al.'s (2011) results showed that mean BDD symptom severity scores improved from moderately severe to the subclinical range. Depressive symptoms significantly improved from moderate to mild and the BABS indicated a change in insight from poor to fair. Follow-up showed that those who completed treatment maintained their gains for at least 6 months and patients reported very high levels of satisfaction with the treatment according to the CSI.

In addition to Wilhelm et al. (2011), Rosen, Reiter, and Orosan (1995) also found that CBT improved BDD. Researchers recruited 54 female patients, ages 20 to 61 years, from an outpatient clinic for treatment of BDD and from mental health therapists, general physicians, plastic surgeons, orthopedists, and dermatologists who referred their patients who had body image complaints. Researchers also recruited participants through newspaper announcements of a "body image therapy" program. Rosen et al. (1995) evaluated participants using the Body Dysmorphic Disorder Examination (BDDE; Rosen & Reiter, 1994). Patients needed to receive minimum ratings of moderately severe symptoms of BDD and score two standard deviations above the community norm for adult women to participate in the study. An additional rater also assessed patient appearance and only participants rated as normal in appearance by both raters were included. Participants' body image complaints included discontent with thighs, abdomen, breast size or shape, skin blemishes, buttocks, facial features, overall weight, scars, aging, hair, height, hips, teeth, and arms.

Researchers randomly assigned participants to the cognitive behavior therapy group or a control group, and assessed patients after two weeks of treatment versus no-treatment. Patients in the no-treatment condition were subsequently offered therapy. Rosen et al. (1995) assessed participants a third time after 4.5 weeks of treatment. The no-treatment control group received

therapy after a 10-week waiting period. The treatment consisted of eight, two-hour group sessions. Groups contained four or five participants each.

The cognitive behavior therapy consisted of (a) an audiotape program on body image, and explanation of BDD causation and treatment; (b) then participants explained the distressing aspects of their appearance to the group and received objective feedback about their appearance and/or perceived defects, and rehearsed more accurate representations of their appearance defects; (c) participants constructed hierarchies of distressing aspects of their appearance and engaged in exposure therapy, thought stopping, and relaxation to extinguish subjective distress; (d) participants practiced refraining from critical self-talk and substituted more objective sensory descriptions of the body parts; (e) therapists gave participants homework to expose themselves imaginally and then in front of the mirror and interrupt negative self-talk; (f) participants kept a body image diary throughout treatment where they recorded relevant situations, body image thoughts in these situations, and their effects on mood and behavior; (g) therapists helped participants correct more damaging beliefs in relation to appearance for self-worth or relationships, especially beliefs that caused them to be ashamed or embarrassed; (h) participants engaged in exposure therapy to overcome distressing avoidance of feared body image and self-consciousness during group treatment and assigned homework; (i) participants were given response prevention to decrease body checking behaviors; (j) participants were instructed in principles of relapse prevention (Rosen et al., 1995).

Measures included the Body Dysmorphic Disorder Examination (BDDE Version 3.1, Rosen & Reiter, 1994) to assess symptoms of body dysmorphic disorder, the Body Shape Questionnaire (Cooper, Taylor, Cooper, & Fairburn, 1987) to assess the desire to lose weight, body dissatisfaction and feelings of low self-worth in connections with weight and shape, the

Multidimensional Body Self-Relations Questionnaire (MBSRQ) Appearance Evaluation Scale (Brown, Cash, & Mikulka, 1990) to measure feelings of physical attractiveness or unattractiveness and satisfaction or dissatisfaction with one's looks, the Brief Symptoms Inventory (Derogatis & Spencer, 1982) to assess overall psychological distress, and the Rosenberg Self-Esteem Scale (Rosenberg, 1979) to measure global self-esteem.

Participants in cognitive behavior therapy showed significant improvement on all measures (e.g., Body Dysmorphic Disorder Examination, Appearance Evaluation Scale, Body Shape Questionnaire, psychological symptoms, and self-esteem) from pre- to post-treatment compared with the no-treatment participants. Treatment participants also significantly improved over time. The majority of participants no longer presented with symptoms of BDD, and the mean preoccupation with appearance and body dissatisfaction as measured on the Body Shape Questionnaire and MBSRQ Appearance Evaluation Scale decreased from the clinically severe range to the normal range (Rosen et al., 1995).

Cognitive Behavioral Therapy is effective in treating BDD (Philips et al., 1995; Wilhelm et al., 2011); however, psychotropic medication is also an option for individuals with BDD symptomology (Philips, Dwight, & McElroy, 1998). Philips et al. (1998) investigated the use of Fluvoxamine in treatment of BDD. Researchers recruited 30 participants, ages 18-65, from newspaper advertisements and clinical referrals. Participants met criteria for BDD based on the DSM-IV (American Psychological Association, 1994), had a minimum score of 5 on the first three items of the Yale-Brown Obsessive Compulsive Scale Modified for BDD (BDD-YBOCS: Philips et al., 1997), and a minimum score of 7 on the NIMH Obsessive Compulsive Scale (Insel, Murphy, & Cohen, 1983).

Baseline assessments included the DSM-IV BDD (Philips et al., 1995) to determine BDD symptoms, the SCID for DSM-III-R (Spitzer et al., 1992) and the Structured Clinical Interview for DSM-III-R for Axis-II (Williams, Gibbon, First et al., 1992) to assess associated psychopathology, BDD-YBOCS (Philips et al., 1997) to assess the severity of BDD, and the CGI (NIMH, 1985), the Brown Assessments of Beliefs Scale (Eisen et al., 1998) to assess delusionality, and the Hamilton Rating Scale for Depression (Hamiliton, 1960) and the Montgomery-Asberg Depression Rating Scale (MADRS: Montgomery & Asberg, 1979) to measure depressive symptoms. All participants underwent a physical examination, EEG, and screening laboratory tests at baseline (Philips et al., 1998).

After completing all baseline evaluations, Philips et al. (1998) gave all participants 50mg/day of fluvoxamine during the 16-week study. The dosage was increased to 50mg, twice per day on day 5 and to 150mg/day on Day 9 for 6 days. The dosage continued to increase weekly by 50mg/day increments to a maximum dose of 150mg twice per day if tolerated. Researchers evaluated the participants with the BDD-YBOCS, CGI, and HAM-D, and MADRS at baseline and weekly for the first 4 weeks of the study and every other week for the remainder of the study. Participants completed the YBOCS and the Brown Assessment of Beliefs scale at baseline and at weeks 4, 8, 12, and 16.

Results (Philips et al., 1998) showed that BDD-YBOCS scores decreased significantly from baseline and the CGI indicated that participants were treatment responders with 10 rated as much improved and 9 as very much improved. Depression scores significantly improved as well as did scores on the HAM-D and the MADRS.

There are no empirically validated treatments for MD (Olivardia, 2001), thus treatments for BDD provide researchers with a framework for intervention since MD is a subtype of BDD

and includes similar symptomology (DSM-IV-TR; American Psychiatric Association, 2000). Treatments for BDD, such as CBT and the use of psychotropic medications like fluvoxamine, are effective in reducing body dysmorphic symptoms and psychological symptoms (Wilhelm et al., 2011; Philips et al., 1995). Therefore, individuals with MD will most likely benefit from CBT and psychopharmocological interventions.

Pilot Study

The pilot study for this dissertation (Lividini, 2010) built on previous research and expanded the investigation of MD to the adolescent school-aged population. I (Lividini, 2010) examined male adolescent athletes with MD symptoms, because MD is more common in males (Olivardia, 2007; Pope et al., 1997) and most prevalent in male adolescents who engage in sports (Cafri et al., 2008; Cafri et al., 2006). The pilot study was an attempt to understand: (a) the relationship between adolescents' athletic and academic performances and unhealthy habits and preoccupation with being muscular and (b) the relationships among symptoms of MD and self-esteem, perfectionist qualities, and substance use in accordance with previous research (Cafri et al., 2008; Cafri et al., 2006; Ebbeck et al., 2009; Hildebrandt et al., 2006; Kuennen & Waldron, 2007; Maida & Armstrong, 2005; Olivardia et al., 2004; Olivardia et al., 2000; Wolke & Sapouna, 2008).

The pilot used a convenience sample of male high school athletes. The experimenter met with the superintendent and athletic director of the Rye Neck School District and the principal of Rye Neck High School to explain the study and to obtain permission to conduct the study. Then the experimenter met with the coaches and sports teams before a team practice to explain the study to students and distribute parental consent forms The parental consent form included a self-addressed return envelope. On the consent form, the experimenter asked parents to mail the

completed form back to her. The experimenter gave parental consents to 80 students and received 13 consents in return. All 13 students and their parents consented to participate.

The experimenter contacted the coaches of the sports teams, via email, she received once the parental consent forms and asked to meet with the students whose parents gave consent to participate in the study. The experimenter notified students participating to meet after school in the health room or during their study hall. The experimenter notified coaches that students might be late to practice when completing the questionnaire, gave parental consents to 80 students and received 13 consents in return (16%), and distributed questionnaires to participants before athletic practice. The questionnaire was four-pages and asked for demographic information including sport currently played, and additional sports played during a different season. The questionnaire consisted of 50 items that assessed symptoms of MD, self-esteem, and perfectionism qualities selected from the MASS (Mayville et al., 2002), the RSES (Rosenberg, 1965), and the Multidimensional Perfectionism Scale (Frost et al., 1990). Items were randomly distributed across the questionnaire and students circled one of four responses in relation to the questions (*Strongly Agree, Agree, Disagree, or Strongly Disagree*). Coaches of the student participants evaluated the ability of each student by describing their athletic performance as exceptional, average, or weak. In addition, the researcher gathered grades from the school administration website. Once she matched the grades, athletic performance, and responses to the questionnaires for each student, the researcher removed all identifying information, and coded the information to keep the identity of the students private.

The pilot did not find statistically significant correlations between MD symptoms and self-esteem, perfectionism qualities, or academic performance measured by GPA. Nonetheless, consistent with previous research (Baghurst & Lirigg, 2009; Buhlmann et al., 2008; Cafri et al.,

2008; Cafri et al., 2006; Chandler et al., 2009; Chaney, 2008; Davis et al., 2005; Ebbeck, et al., 2009; Kuennen & Waldron, 2007; Lantz et al., 2002; Leit et al., 2001; Maida & Armstrong, 2005; Olivardia et al., 2004; Philips et al., 2004; Sassaroli et al., 2008; Wolke & Sapouna, 2008) these relationships were in the predicted directions and may have reached significance with a larger sample size. In other words, student athletes with more MD symptoms showed lower self-esteem, higher perfectionism qualities, and lower GPA.

The pilot study had several limitations (Lividini, 2010), which likely contributed to the statistically insignificant results. The very small sample size (n = 13) and lack of sample variability (e.g., each sport had few representatives) reduced the likelihood of finding significant relationships. The pilot questionnaire also had limitations with items that assessed various attributes (i.e., MD, self-esteem, and perfectionism) being clustered together in a manner that might have telegraphed the intent of the study to participants. Subtests also had widely varying numbers of items. Most student athletes reported very high levels of self-esteem in the pilot study (Lividini, 2010) that approached a statistical ceiling. This could have been the result of a social desirability response bias (Leite & Cooper, 2010). The presence of the experimenter in the room during questionnaire completion could also have influenced participants' responses. The dissertation will attempt to address each of the limitations described. Overall, changing the item layout, requiring students to complete the questionnaire alone without the experimenter and other participants present, and adding distracter items may decrease the students' need respond in a socially desirable format and not alert students to answer with patterned responses. Despite its limitations, however, the pilot study provided insight into the presence of MD symptoms in male secondary school athletes.

Rationale and Hypotheses

Investigation of MD within the school-aged athlete population is minimal and academic effects are unknown. Further research in this area is warranted. The age of onset for MD is in late adolescence (*M* = 19.4 years; *SD* = 3.6 years) (Olivardia et al., 2000), and therefore, it is likely that high school students may demonstrate MD symptoms that may or may not affect their academic (Lividini, 2010) and athletic performance. Power sports and weightlifting are common among athletes at the secondary school level. Previous research has connected these activities with risk of MD symptomatology among adolescents (Cafri et al., 2008; Cafri et al., 2006). OCD, which is related to MD (Chandler et al., 2009; Maida & Armstrong, 2005; Wolke & Sapouna, 2008), is also common among adolescents (Chowdhury et al., 2004; Heyman et al., 2003), thus providing more support for the notion that MD may be prevalent within the school-aged population. The high incidence of perfectionist qualities in individuals with MD symptoms (Buhlman et al., 2008; Kuennen & Waldron, 2007; Sassaroli et al., 2008), particularly sensitivity to making mistakes in school-aged individuals diagnosed with OCD (Ye et al., 2008), suggests that adolescents with MD symptomatology will also show increased perfectionist qualities. MD and BDD are related to low self-esteem, poor self-concept, and depression according to research (Cafri et al., 2006; Chaney, 2008; Ebbeck et al., 2009; Maida & Armstrong, 2005; Olivardia, 2004; Philips et al., 2004) and those with MD symptoms commonly use performance-enhancing drugs (Baghurst & Lirigg, 2009; Cole et al., 2003; Kanayama et al., 2006; Olivardia et al., 2000; Olivardia et al., 2004). Male athletes show self-image struggles at the secondary level (Lividini, 2010) and may develop symptoms of MD. It is therefore possible that high school athletes who believe their performances are subpar may develop MD symptoms to try to better their athletic performances. In contrast athletes who are performing at a higher level may develop symptoms

to maintain good performance. Similarly, male secondary athletes' academic achievement may be positively or negatively affected by MD symptoms.

Extending previous MD research to the school-age athlete population, the proposed study will examine: (a) the relationship between adolescents' athletic and academic performances and unhealthy habits and preoccupation with being muscular and (b) the relationships among symptoms of MD and adolescents' media engagement, self-esteem, perfectionist qualities, and substance use. The proposed research was designed with the following hypotheses:

HO1: Male secondary school athletes will show symptoms of muscle dysmorphia.

HO2: In accordance with previous research (Cafri et al., 2006; Leit et al., 2001), symptoms of MD will be positively related to media influence.

HO3: In accordance with previous research (Buhlmann et al., 2008; Davis et al., 2005; Kuennen & Waldron, 2007; Sassaroli et al., 2008), symptoms of MD will be positively related to perfectionist qualities.

HO4: In accordance with previous research (Chaney, 2008; Olivardia et al., 2004; Philips et al., 2004), symptoms of MD will be negatively related to self-esteem.

HO5: In accordance with previous research (Baghurst & Lirigg, 2009; Cole et al., 2003; Kanayama et al., 2006; Olivardia et al., 2000; Olivardia et al., 2004) symptoms of MD will be positively related to students' perception that it is acceptable to use performance-enhancing products to add muscle mass.

HO6: MD symptomatology will predict secondary school athletes' athletic and academic performance.

CHAPTER III

Method

This chapter presents the methodology that the study used to examine the prevalence of Muscle Dysmorphia (MD) symptomatology among male adolescent student athletes and its relation to sport participation, athletic and academic performance, as well as self-esteem, perfectionist qualities, media influence, and substance use. The chapter includes the following sections: participant selection, description of the measures, procedure, and data analysis.

Participant Selection and Demographic Information

Once the Institutional Review Board of the City University of New York Graduate School and University Center approved the study, I presented my dissertation study to the superintendents of two local, suburban school districts to gain their approval (see Appendix A). One district consisted of a total population of 1,553 students. Seventy percent of the population was Caucasian, 3% African American, 9% Asian, and 15% Hispanic. Eleven percent of students received free or reduced priced lunches. The second district consisted of a population of 5,075 students. Seventy-Five percent of the population was Caucasian, 3% African American, 4% Asian, and 17% Hispanic. Seven percent of students received free or reduced priced lunches.

Next, I sought approval from the athletic directors (see Appendix B) at the schools to solicit their team members and coaches. I requested participation from members of the junior varsity and varsity male sports teams during the spring, fall, and winter 2012 sport seasons. The teams included in the study solicitation were: football, basketball, baseball, tennis, golf, track, cross-country, lacrosse, ice hockey, and soccer.

Solicitation of coaches and athletes was as follows. First, I emailed and met with the coaches of the junior varsity and varsity male sports teams and gained their consent to participate

(see Appendices C & D) in the study. Next, for the football, basketball, ice hockey, track, and lacrosse teams, I set up a time to meet with each coach and team at a practice after school hours to explain the study and distribute parental consents (see Appendix E) to the players. At the meetings, I instructed the athletes to bring the signed parent consents to their coaches who would then give them to me. For members of the cross-country, tennis, golf, soccer, and baseball teams, I mailed parental consents (Appendix E) to their homes with a self-addressed return envelope. Additionally, I emailed parental consents (see Appendix F) to the parents of students on the soccer and track teams.

I only solicited male participants because of reports of a higher prevalence of males than females with MD symptomatology (Olivardia, 2007; Pope et al., 1997). I distributed, mailed, and/or emailed 323 parental consent forms and received 74 signed consents. The return rate was 22.91%. Seven students for whom I received parental permission were absent at the time of the questionnaire administration. Thus, they were unable to complete the questionnaire. The final sample included 67 participants (20.74% of those solicited) who gave their assents (Appendix G) and completed the questionnaire (see Appendix H).

Participant demographics. Participants indicated their age, grade, current sport played, and other sports played. Table 1 presents participant ages, grades, and sports played. From Table 1, we see that most participants were ages 16 or 17. The second largest age group ranged from 13-14 years. Only 2 participants were age 18. We also see that over half the sample was composed of 11^{th}- and 12^{th}-graders. Table 1 also shows that the majority of participants participated in ice hockey, and the second largest group of participants played lacrosse. To evaluate the socio-economic status of participants in the sample, I asked parents to indicate whether or not students receive reduced or free lunch. Only 6 of the 67 participants (8.96% of the

sample) received reduced or free lunch. Thus, the sample had very few participants of lower socio-economic status.

Table 1

Participant Demographics

Student Demographics	Descriptor	*N*	%
Age	14	13	19.40
	15	14	20.90
	16	20	29.85
	17	18	26.87
	18	2	2.99
Grade	9	17	25.37
	10	12	17.91
	11	19	28.36
	12	19	28.36
Sport			
	Baseball	4	5.97
	Basketball	3	4.48
	Cross Country	4	5.97
	Football	10	14.93
	Golf	1	1.49
	Ice Hockey	16	23.88
	Lacrosse	12	17.91
	Soccer	6	8.96
	Track	5	7.46

Measures

Participants completed a four-page questionnaire (See Appendix H). The questionnaire took approximately 10 minutes to complete and consisted of 51 items that assessed symptoms of MD, self-esteem, perfectionist qualities, and media influence. The questionnaire also included distracter items, which assessed self-efficacy to divert the participants' attention from MD, self-esteem, perfectionism qualities, or media influence, deter the students from identifying and understanding what the questions tapped, and reduce the likelihood of students answering any questions similarly.

Demographic information. The survey asked participants about their background. Demographic items queried participants about their age, grade, current sport played, and additional sports played during a different season. To ensure confidentiality, participants did not provide any identifying information. Participants and/or their parents who had questions about the study and/or wanted to review the results once the study was completed were able to contact me directly via email.

Muscle Dysmorphia. Items used to assess MD symptomatology came from the Muscular Appearance Satisfaction Scale (MASS; Mayville, Williamson, White, Netemeyer, & Drab, 2002). The MASS consists of 19 items and five subscales: Bodybuilding Dependence (5 items), Checking (4 items), Substance Use (4 items), Injury (3 items), and Muscle Satisfaction (4 items).

Mayville et al. (2002) assessed the psychometric qualities of the MASS. Internal consistency estimates for the five subscales showed alphas ranging from .73 to .82. The total alpha was .82, indicating that it is a sound measure of muscle dissatisfaction. The test-retest reliability of the entire MASS was r (43) = .87. The correlations among the five factors ranged from .16 to .82. The total MASS scores correlated significantly with the Body Dysmorphic

Disorder Examination-Self-Report (BDDE-SR; Rosen & Reiter, 1994), all subscales of the Bodybuilding Dependence Scale (BDS; Smith, Hale, & Collins, 1998), and the total score of the Social Physique Anxiety Scale (SPAS; Hart et al., 1989), indicating a shared relationship with the construct of MD. The relationship of the MASS total score and the five subscales suggests that the MASS assesses the various dimensions of MD (Mayville et al., 2002).

This study used items from the MASS because the measure taps into the criteria for MD as outlined by Pope et al. (1997). The Checking subscale measures reassurance-seeking and mirror-seeking behavior to assess the appearance of one's muscles. The Muscle Satisfaction subscale evaluates satisfaction with one's own muscle size and definition. Both the Checking and Muscle Satisfaction subscales assess the first criterion of MD: "A person has a preoccupation with the idea that his body is not sufficiently lean or muscular" (Pope et al., 1997, p. 556). The Bodybuilding Dependence subscale reflects an excessive self-investment in the activity of weight lifting along with a compulsive tendency to exercise with weights and relates to the MD criterion: "The individual frequently gives up important social, occupational, or recreational activities because of a compulsive need to maintain his workout or diet schedule" (Pope et al., 1997, p. 556). Further, the Injury subscale evaluates symptoms of overtraining and beliefs associated with unsafe weight lifting behavior, and the Substance Use subscale describes a willingness to try steroids and other potentially risky means to obtain muscle mass. Both the Injury and Substance Use subscales relate to the MD criterion: "The individual continues to work-out, diet, or use performance-enhancing substances despite knowledge of adverse physical and psychological consequences" (Pope et al., p. 556). Last, the Muscle Satisfaction subscale also relates to the MD criterion: "The primary focus of the preoccupation and behavior is on

being too small or inadequately muscular and not on being fat, as it is in anorexia nervosa" (Pope et al., 1997, p. 556).

Ryan and Morrison (2010) provided further support for the validity of the MASS to assess MD symptomatology. The researchers' factor analysis showed that items comprising the four subscales: Bodybuilding Dependence, Muscle Checking, Substance Use, and Injury formed one factor, entitled general MD symptoms. Therefore, Ryan and Morrison (2010) suggested that the four subscales signify general MD symptoms instead of independent constructs.

The questionnaire in this study contained 10 items from the MASS, 2 items from each of the five subscales in order to assess MD symptoms comprehensively. Items chosen for each subscale had the highest factor loading with their respective subscale (Ryan & Morrison, 2010). Factor loadings for these items with their scales ranged from .74 to .83. The items chosen for the questionnaire from the Substance Use subscale of the MASS also measured the participants' use of performance enhancing drugs. The original item number 6 from the MASS, "It is OK to use steroids to add muscle mass?" was adjusted to say "It is okay to use performance enhancing products to add muscle mass?" because the goal of this study was to understand participants' use of all performance enhancing drugs, not specifically steroid-use. Items are rated on a 4-point Likert Scale (*Strongly Agree, Agree, Disagree,* or *Strongly Disagree*). Scores on the MD measure of the questionnaire range from 0-30, and higher scores indicate more evidence of MD symptomatology. The current questionnaire uses the same 4-point scale to assess each of the study variables (i.e., MD, Self-Esteem, Perfectionism, and Media Influence) and a similar numbers of items assess each of the study variables as well. MD items are randomly distributed across the questionnaire. The internal consistency of the MD scale used in the study was .75 (alpha). After the administration of the questionnaire to participants, I found that one of the items

was a repeated item. The item stated: “To get big, one must be able to ignore a lot of pain”. Scoring analysis included the repeated item.

Self-Esteem. The questionnaire contained all 10 items of the Rosenberg’s Self-Esteem Scale (RSES; Rosenberg, 1965) to assess self-esteem. The 10 items of the scale included 5 positively and 5 negatively phrased first person evaluative statements randomly distributed across the questionnaire. The items provide the individual’s judgment about the self as a whole and overarching characteristics of the person (Butler & Gasson, 2005). As indicated above, participants respond to the 10 RSES items on a 4-point Likert scale (*Strongly Agree, Agree, Disagree,* or *Strongly Disagree*) that is the same for all questionnaire items. Scores range from 0 to 30, and the higher scores on the RSES indicates higher self-esteem. Scores between 15 and 25 are within the normal range, and scores below 15 suggest low self-esteem. The negatively worded items are reversed scored (Rosenberg, 1965).

Sinclair, Blais, Gansler, Sandberg, Bistis, and LoCicero (2010) investigated the psychometric properties of the RSES using a sample of adults from the United States across demographic subgroups. The RSES showed high internal consistency with a Cronbach’s coefficient alpha of .91 and was negatively correlated with depression, anxiety, and stress as measured on the Depression, Anxiety, and Stress Scales (Lovibond & Lovibond, 1995), demonstrating strong construct validity. In the current study, the internal consistency of the RSES was α =.83.

This study used the RSES instead of other measures of self-esteem such as the Piers-Harris Children’s Self-Concept Scale (1969), because it is the most widely used unidimensional measure of global self-esteem (Byrne, 1996) and is popular given its face validity, brevity, and

simplicity. The RSES provides a measure of one's overall self-worth as an individual (Rosenberg, 1965).

Perfectionism. Items used to assess perfectionist qualities came from the Concern Over Mistakes subscale of the Multidimensional Perfectionism Scale (MPS; Frost et al., 1990). The MPS consists of six subscales: Concern over Mistakes (CM), Personal Standards (PS), Parental Expectations (PE), Parental Criticism (PC), Doubts about Actions (D), and Organization (O). The dissertation questionnaire included the nine items from the CM subscale of the MPS because individuals with eating disorders, including MD, and those with a drive for muscularity are also likely to experience perfectionist qualities specifically related to concern over making mistakes (Buhlman et al., 2008; Sassaroli et al., 2008). The CM subscale of the MPS shows a high internal consistency with a Cronbach's alpha of .88 (Frost et al., 1990). The CM subscale of the MPS was most highly correlated with the Self-Evaluative (SE) Scale from the IBT (Jones, 1968) and the Perfectionism Scale from the EDI (Garner et al., 1983) demonstrating that a major component of perfectionism is concern over mistakes. The internal consistency of the items used from the MPS in the current study was $\alpha = .72$. After administration of the questionnaire, I found that one of the items was a repeated item. The item "People will probably think less of me if I make a mistake" was repeated. Scoring analysis included the repeated item.

This study used items from the MPS because the MPS is the most widely used instrument in MD research (Buhlmann et al., 2008; Davis et al., 2005; Kuennen & Waldron, 2007; Sassaroli et al., 2008). Other perfectionism measures that are inappropriate for use in the proposed study were designed for evaluation within specific age populations, such as the Adaptive/Maladaptive Perfectionism Scale (Rice, Kubal, & Preusser, 2004) normed for fourth- and fifth-grade students, ages 9 through 11. Because the participants in this study are 9^{th}- through 12^{th}- grade students, it

is inappropriate to use a measure normed for younger children. Participants respond to the items of the Concerns Over Mistakes subscale of the MPS on a 4-point Likert scale (*Strongly Agree, Agree, Disagree,* or *Strongly Disagree*) to maintain a similar rating and number of items (8-12) on the questionnaire for each of the four scales (e.g., MD, Self-Esteem, Perfectionism, and Media Influence) in the study questionnaire. Scores on the MPS CM ranged from 0-27, and higher scores reflect more perfectionistic qualities. The perfectionism items are randomly distributed across the questionnaire.

Media Influence. The questionnaire contained 12 items from the modified Sociocultural Attitudes Towards Appearance Questionnaire-Third Edition (SATAQ-3; Karazsia & Crowther, 2008). The SATAQ-3, originally adapted for females (Thompson, van den berg, Roehrig, Guarda, & Heinberg, 2004), assesses various dimensions of media influence on body image. The SATAQ-3 consists of four subscales: Information, Pressures, Internalization-General, and Internalization-Athletic. Karazsia and Crowther (2008) reworded items that focused on "thinness" or looking "pretty" and "thin" to emphasize looking "muscular" or looking "muscular" (e.g., Item #10 was changed from "I've felt pressure from TV and magazines to be thin." To "…to look muscular." Further, item # 15 "I wish I looked like models in music videos" was deleted from the original SATAQ-3 (Thompson et al., 2004) because research shows that the time males spend viewing music videos decreases with age (Tiggemann, 2005).

The present study included all seven items of the Pressures subscale that assesses feeling pressured by the media to strive for cultural ideals of physical appearance and all five items of the Internalization-Athletic scale that assesses endorsement and acceptance of an athletic body ideal. The questionnaire includes items from the Pressures subscale of the SATAQ-3 because research shows that media influence predicts MD symptoms and attitudes about body appearance

in males (Cafri et al., 2006; Leit et al., 2001). Also, the questionnaire includes items from the Internalization–Athletic scale of the SATAQ-3 because this study focuses on male athletes and the media influence on body image, and research supports that power sport participation is related to MD symptomatology (Cafri et al., 2008; Cafri et al., 2006). Karazsia and Crowther (2008) found that the Pressures and Internalization-Athletic subscales of the SATAQ-3 show high internal consistency (α = .95, α=.85, respectively). Further, the Pressures subscale was significantly related with the Body Change Inventory in relation to decreased body size (BCI-Dbs-Behavioral) and the Rosenberg Self-Esteem Scale (RSES). The Internalization-Athlete subscale was significantly related to the Bodybuilder Image Grid-Scaled with respect to muscle (BIG-Mus), the Stepping Stones Inventory in relation to history of substance abuse (SSIHx), and the BCI-Dbs). These correlations indicate that the Pressures and Internalization-Athletic subscales of the SATAQ-3 are associated with body dissatisfaction, tendencies to engage in physical comparisons, negative affect, and muscle-building behaviors.

In this study, participants responded to the 12 items from the SATAQ-3 on a 4-point Likert scale (*Strongly Agree, Agree, Disagree,* or *Strongly Disagree*) to maintain a similar rating and number of items (8-12) on the questionnaire for each of the four scales (e.g., MD, Self-Esteem, Perfectionism, and Media Influence). Scores range from 0-36 and higher scores indicate higher media influence. Media influence items are randomly distributed across the questionnaire. The internal consistency of the media influence items in the present questionnaire was α = .83.

Distracter items. The questionnaire included all 10 items of the General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995), randomly distributed throughout the questionnaire as distracter items increasing the likelihood of diverting the participants' attention from MD, self-esteem, perfectionism qualities, or media influence, deterring the students from

understanding the questions, and possibly reducing the realization of the pattern of questions so participants did not answer similarly from question to question. The GSE contains 10 items respond to a 4-point Likert scale (1 = *Not true at all* to 4 = *Exactly true*). Scores range from 10 to 40 and higher scores indicate higher self-efficacy. Scholz, Dona, Sud, and Schwarzer (2002) examined the psychometric properties of the GSE among participants form 25 countries. The GSE showed high internal consistency among US participants with Cronbach's alphas ranging from .85 to .90. In this study, participants respond to all 10 items of the GSE on a 4-point Likert scale (*Strongly Agree, Agree, Disagree, or Strongly Disagree*) to maintain a similar rating and amount of items (8-12) on the questionnaire for all scales. The internal consistency of the GSE items used in the current scale was $\alpha = .84$. The scale, however, was not used in any of the analyses.

Coaches' survey and academic scores. Participants' coaches completed a brief survey (see Appendix H) to evaluate the athletic ability of each student. I asked coaches to circle one of four choices (3=*Exceptional, 2=Average, 1=Good, 0=Weak*) to describe each student's athletic performance. Scores range from 0-3 and higher scores indicate more athleticism.

I also collected hard copies of participants' New York State Regents Exams scores in the areas of math and science from guidance counselors to evaluate students' academic performance (see Appendix I). The NYS Regents exams are standardized measures given to high school students in grades 9-12 to assess academic performance and understanding of the subject curriculum (Johnson, 2009). I chose science and math Regents exams because students take these tests most often during their high school years compared to social studies and English Regents. Therefore, assessing math and science standardized test scores provided a more valid understanding of academic success at the secondary school level. Once the Regents assessment

scores and athletic performance were matched with each student, all identifying information was removed and information was coded.

Procedure

I re-contacted the coaches of the sports teams who had consented to participate once I received parental consent forms (see Appendices E & F) and asked to meet with the students who had parental consent to participate in the study. Those students whose parents did not sign consent forms did not participate. I spoke with each coach and set up a meeting time after school hours and at a team practice to meet with student athletes who had received parental consent to participate. At the meeting, I explained the study to the students in a group setting (see Appendix I).

Afterwards, I gave assent forms (see Appendix G) to students and read the contents, which explained the study procedure in detail, aloud. I asked the students to read along and sign assent forms if they were willing to participate. I emphasized that students could discontinue their participation at any point. I distributed the questionnaire (see Appendix H) to students whose parents signed the consent forms and who assented to participate and I left the room once I had distributed the questionnaires. The participants were asked to complete the questionnaires honestly and leave them on a table in the front of the room before exiting. I then asked coaches to complete the brief survey to evaluate students' athletic performance (see Appendix J). After that, I contacted guidance counselors, and I collected hard copies of participants' New York State Regents Exams scores in the areas of math and science to evaluate students' academic performance. (see Appendix K).

Data Analysis

I used descriptive statistics to tabulate the demographic variables including age, grade, current sport played, and other sports played. Descriptive statistics also were used for participants' responses regarding MD symptomatology, self-esteem, perfectionism, and media influence as evaluated by the questionnaire. Data were examined using frequency counts, means, and standard deviations of items in each subtest. Questionnaire items (Appendix H) were coded from 0-3 (0 = *Strongly Disagree*, 1 = *Disagree*, 2 = *Agree*, 3 = *Strongly Agree*), thus higher scores indicate higher levels of each variable. Items 5, 10, 15, 25, and 51 from the self-esteem scale and item 24 from the muscle dysmorphia scale were reverse coded (3 = *Strongly Disagree*, 2 = *Disagree*, 1 = *Agree*, 0 = *Strongly Agree*) to assess self-esteem and muscle dysmorphia levels correctly.

The coaches' evaluation of student athlete performance was coded on a 4-point scale (3 = *Exceptional*, 2 = *Good*, 1 = *Average*, 0 = *Weak*). The NYS Regents scores were total scores out of 100 for each participant, with higher totals indicating better performance.

The researcher conducted correlational analysis between independent and dependent variables. Dependent variables were participants' responses on the self-esteem, perfectionism, and media influence items of the questionnaire as well as mean Regent test scores in math and science and athletic performance. The independent variable was MD symptomatology. Regression analysis was used to test hypotheses and examine possible relationships among variables.

Chapter IV

Results

The aim of this study was to examine the prevalence of Muscle Dysmorphia (MD) among male adolescent student athletes and its relation to sport participation, athletic and academic performance, as well as self-esteem, perfectionist qualities, media influence, and substance use. This chapter reports descriptive statistics and results for the hypotheses of this research.

Descriptive Statistics for Study Variables

Table 2 presents the mean, standard deviation, range, and possible range for each of the variables used in this study.

Table 2

Descriptive Statistics for Study Variables

Variable	*M*	*SD*	Range	Possible Range
Muscle Dysmorphia	9.18	3.93	1-20	0-30
Perfectionism	11.37	3.49	4-21	0-27
Self-Esteem	22.22	4.33	10-30	0-30
Media Influence	14.73	5.27	2-26	0-36
Athletic Performance	1.79	0.99	0-3	0-3
Academic Performance *Math Regents Grade*	82.25	10.54	55-100	55-100
Academic Performance *Science Regents Grade*	84.52	7.85	67-100	55-100

Items used to assess MD symptomatology came from the Muscular Appearance Satisfaction Scale (MASS; Mayville, Williamson, White, Netemeyer, & Drab, 2002). Scores on the MD measure of the questionnaire can range from 0-30, and higher scores indicate more evidence of MD symptomatology. If a person agrees or strongly agrees with all of the items, he would achieve a score in the range of 20-30. An examination of the content of the MASS items in Appendix H reveals that each item represents an extreme behavior. Thus, endorsement of any of the MASS items can be a cause for alarm. From Table 2, we see that, overall, participants indicated that they disagreed with the MASS items. But, this was not true of all participants. Examination of the range and standard deviation of the scores indicates that at least one person agreed with all of the items, and others agreed (n = 25) with several of the items. Hypothesis 1 stated that male high school athletes would show symptoms of MD. Students' scores on the MD symptoms scale support this hypothesis.

The questionnaire contained items from the Rosenberg's Self-Esteem Scale (RSES; Rosenberg, 1965) to assess self-esteem. Scores on the self-esteem scale range from 0 to 30, the higher scores indicating higher self-esteem. Scores between 15 and 25 are within the normal range and scores below 15 suggest low self-esteem (Rosenberg, 1965). From Table 2, we see that on average participants showed normal levels of self-esteem.

Perfectionism items were selected from the Concern over Mistakes subscale of the Multidimensional Perfectionism Scale (MPS; Frost et al., 1990). Scores on the MPS CM ranged from 0-27 and higher scores reflect more perfectionistic qualities. From Table 2, we see that overall participants' score of 11.37 suggests that, as a group, they were not highly perfectionistic. Nonetheless, it is important to note that scores ranged up to 21, which suggests that some participants indicated higher levels perfectionistic qualities. If participants agreed or strongly

agreed with all perfectionistic items, they would achieve scores that ranged from 18-27. In this study, three participants had scores in this range, which suggests some cause for concern.

The questionnaire contained 12 items from the modified Sociocultural Attitudes toward Appearance Questionnaire-Third Edition (SATAQ-3; Karazsia & Crowther, 2008) to measure media influence. From Table 2, we see that overall participants' score of 14.73 suggests that they were not highly influenced by the media. Readers are again advised to attend to the high end of the range of scores in Table 2. Although, most of the student athletes indicated little media influence; some students indicated considerable more media influence than others.

Table 3 gives the coefficient alpha reliabilities of the muscle dysmorphia, media influence, self-esteem, and perfectionism scales for this study. Alphas ranged from .72 to .83 and are adequate for research purposes (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 1999).

Table 3

Reliability Coefficients of Scales

Scale	Number of Items	Cronbach's Alpha
Muscle Dysmorphia	10	.75
Media Influence	12	.83
Self-Esteem	10	.83
Perfectionism	9	.72

Participants' coaches completed a brief survey (see Appendix J) to evaluate the athletic ability of each student by indicating one of four choices (3 = *Exceptional, 2 = Good, 1=Average, 0=Weak*). Scores range from 0-3 and higher scores indicate more athleticism. As seen on Table

2, overall participants showed between good and average athletic performance with a mean score of 1.79.

Student's academic performance was measure with the NYS Regents exams in math and science. The NYS Regents exams are standardized measures given to high school students' grades 9-12 to assess academic performance and understanding of the subject curriculum (Johnson, 2009). Scores above 65 are considered passing scores. As seen on Table 2, overall participants in this study passed the standardized Regents exam and showed average scores in the 80-range in math and science.

Prevalence of Muscle Dysmorphia Symptomology across Age, Grade, and Sport Played

The following tables examine MD symptoms across ages, grades, and sports played.

Table 4

Muscle Dysmorphia Symptomatology across Age

Age	*n*	*M*	*SD*
14	13	9.00	3.67
15	14	10.71	4.68
16	20	9.70	4.07
17	18	7.72	3.18
18	2	7.50	0.71
Total	67	9.18	3.93

Note. N = 67

From Table 4, we see that male athletes who were age 15 show the highest prevalence of MD symptomology, and those who were 18 showed the lowest prevalence of MD symptoms. The sample mean was 9.18 (*SD* = 3.93). A *t*-test between muscle dysmorphia at the age of 15

with the ages of 17 and 18 was significant, t (32) = 2.29, $p < .05$. Therefore, the prevalence of MD symptomatology at age 15 was significantly greater than at ages 17 and 18.

Table 5

Muscle Dysmorphia Symptomatology Across Grade

Grade	*n*	*M*	*SD*
9th	17	9.94	3.79
10th	12	9.71	5.22
11th	19	9.32	4.12
12th	19	8.37	2.97

Note. N = 67

Table 5 shows the highest prevalence of muscle dysmorphic symptoms in male athletes from 9th through 11th grade. If we examine Tables 4 and 5 together, we see that the highest MD scores are for students who are 15 and in 9th and 10th grade. Readers will note, however, that the MD symptoms between grades are very similar.

A non-parametric independent samples median test was performed to accommodate for outliers. Results showed that there was a statistically significant difference between the medians of the MD scale across age, $p = .034$. Therefore, MD symptomatology did vary across age.

Table 6

Percentages of MD Symptomatology Across Age

Age	Percent of Sample Above the Median	Percent of Sample Below the Median
14	46%	54%
15	77%	23%
16	55%	45%
17	28%	72%
18	0%	100%

Table 6 shows the percentage of participants who scored above and below the median for MD symptomatology for each age group. Participants at age 15 showed the greatest percentage of MD symptoms above the median, thus the largest difference in MD symptoms in the sample.

Table 7 shows the mean number of MD symptoms among those who participated in power sports and non-power sports. Power sports included football, track, and baseball as identified in previous research (Cafri et al., 2006; Endresen & Olweus, 2005) and non-power sports consisted of the rest of the sports teams in the sample (e.g., basketball, cross country, soccer, golf, ice hockey, lacrosse, and tennis). A *t*-test between mean MD symptomotology for power sports and non-power sports was not significant, $t\ (65) = -.17$, $p > .05$. Thus, male athletes engaged in power sports did not show different levels of MD symptoms than male athletes engaged in non-power sports according to the present sample. Figure 1 (see Appendix L) is a graphic representation of age and power sports. The figure shows the non-linear relationship between MD symptoms across age. Participation in power sport vs. non-power sport varies; however, MD symptoms show a dramatic increase at age 15 and a decrease from ages 16 to 18.

Table 7

Muscle Dysmorphia Symptomatology Across Power Sports and Non-Power Sports

Sport	*n*	*M*	*SD*
Power Sports	20	9.05	4.25
Non-Power Sports	47	9.23	3.83

Table 8 shows that male lacrosse, cross country, ice hockey, and football players all have mean MD symptomatology scores over 9.00, which are not high scores for this scale. The lowest prevalence of muscle symptomatology was shown among male soccer players. A *t*-test between the sport with the highest mean of muscle dysmorphia symptoms (cross country) and the sport with the lowest mean of muscle dysmorphia symptoms (soccer) was not significant, $t\ (8) = 2.24$, $p > .05$. Therefore, none of the differences between sports in Table 5 are significant.

Table 8

Muscle Dysmorphia Symptomotology across Sports

Sport	*n*	*M*	*SD*
Baseball	4	8.50	2.38
Basketball	3	7.67	2.52
Soccer	6	7.33	1.97
Golf	1	13.00	N/A
Track	5	8.20	4.15
Cross Country	4	10.00	1.63
Football	11	9.64	4.99
Lacrosse	12	9.92	4.70
Tennis	5	7.80	4.09
Ice Hockey	16	9.75	4.16

Note. N = 67

Relationship between Participants' Reported Muscle Dysmorphia Symptomotology and Self-Esteem, Perfectionism, Media Influence, Academic Performance, and Athletic Performance

Table 9 presents the inter-correlations among study variables and results of correlational hypotheses. The variables hypothesized to be related to MD related to MD in the predicted directions with effect sizes that range from -.22 to .46. These variables imply a cluster of characteristics that are associated with MD.

Table 9

Inter-correlations between Study Variables

	Muscle Dysmorphia	Self-Esteem	Perfectionism	Media Influence	Academic Performance Math Regents Grade	Academic Performance Science Regents Grade	Athletic Performance
Muscle Dysmorphia	1						
Self-Esteem	-.23	1					
Perfectionism	.46**	-.28*	1				
Media Influence	.44**	-.22	.38**	1			
Academic Performance Math Regents Grade	.03	-.20	.03	.10	1		
Academic Performance Science Regents Grade	-.01	-.08	-.01	.03	.71**	1	
Athletic Performance	.05	.191	.08	.05	-.15	-.08	1

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

Hypothesis 2 stated, in accordance with previous research (Cafri et al., 2006; Leit et al., 2001), that symptoms of MD would be positively related to media influence. Table 6 shows that this hypothesis was supported by the significant, positive correlation between muscle dysmorphia and media influence ($r = .44$, $p < .05$).

Hypothesis 3 stated, in accordance with previous research (Buhlmann et al., 2008; Davis et al., 2005; Kuennen & Waldron, 2007; Sassaroli et al., 2008), that symptoms of MD would be positively related to perfectionist qualities. Hypothesis 3 was also supported in the present study by the significant, positive correlation in Table 6 between muscle dysmorphia and perfectionism ($r = .46$, $p < .05$).

Hypothesis 4 stated, in accordance with previous research (Chaney, 2008; Olivardia et al., 2004; Philips et al., 2004; Ye et al., 2008), that symptoms of MD would be negatively related to self-esteem. Hypothesis 4 was not supported in the present study. The correlation between muscle dysmorphia and self-esteem was not significant (r = -.23, p > .05), however it was in the negative direction. According to Cohen (1992), effect sizes of .10 are small, and .30 are moderate. Therefore, the correlation of -.23 shows a small to medium effect size that may have been significant with a larger sample size.

Hypothesis 5 stated that, in accordance with previous research (Baghurst & Lirigg, 2009; Cole et al., 2003; Kanayama et al., 2006; Olivardia et al., 2000; Olivardia et al., 2004), symptoms of MD would be positively related to students' perception that it is okay to use performance-enhancing products to add muscle mass. I use the item: "Is it okay to use performance-enhancing products to add muscle mass?" from the MD subscale to assess this hypothesis. I was unable to test this hypothesis statistically, because students indicated overwhelmingly that they did not find it acceptable to use performance-enhancing products. But, 3% of the participants (n= 2) indicated willingness to use performance-enhancing products.

Hypothesis 6 stated that MD symptomatology would predict secondary school athletes' athletic and academic performance. Inter-correlational analysis presented in Table 6, did not support this hypothesis. The correlation between muscle dysmorphia and athletic performance was not significant (r = .05, p > .05). In regard to academic performance, the correlation between muscle dysmorphia and science regents grade was not significant (r = -.01, p > .05) and the correlation between muscle dysmorphia and math regents grade was not significant (r = .03, p > .05).

Summary of Findings Related to Study's Hypotheses

Table 10 summarizes this study's hypotheses and indicates which hypotheses were supported by the research findings. As can be seen from the table, three of the six hypotheses received support.

Table 10

Overview of Results of Hypothesis Testing

Hypothesis	Study Hypothesis	Supported/ Not Supported
H01	Male secondary school athletes will show symptoms of muscle dysmorphia.	Supported
H02	In accordance with previous research (Cafri et al., 2006; Leit et al., 2001), symptoms of MD will be positively related to media influence.	Supported
H03	In accordance with previous research (Buhlmann et al., 2008; Davis et al., 2005; Kuennen & Waldron, 2007; Sassaroli et al., 20083), symptoms of MD will be positively related to perfectionist qualities.	Supported
H04	In accordance with previous research (Chaney, 2008; Olivardia et al., 2004; Philips et al., 2004), symptoms of MD will be negatively related to self-esteem.	Not Supported
H05	In accordance with previous research (Baghurst & Lirigg, 2009; Cole et al., 2003; Kanayama et al., 2006; Olivardia et al., 2000; Olivardia et al., 2004), symptoms of MD will be positively related to students' perception that it is okay to use performance-enhancing products to add muscle mass.	Not Tested
H06	MD symptomatology will predict secondary school athletes' athletic and academic performance.	Not Supported

Supplemental Results

The goal of the present study was to examine MD symptomatology among male student athletes at the secondary school level. In addition to results of hypothesis testing, several other

interesting findings emerged that merit mention. Table 11 presents the participants' responses to the questionnaire item: *"I would try anything to get my muscles to grow."* from the MD subscale. Endorsement of this item shows that participants are eager to enhance their muscle size using whatever means necessary, a strong indicator of MD (Pope et al., 1997).

Table 11

Participant Response to the Item: "I would try anything to get my muscles to grow."

Response	*n*	%
Strongly Disagree	24	35.82
Disagree	35	52.24
Agree	6	8.96
Strongly Agree	1	1.49

From Table 11, we see that almost 9% of participants agreed that they would try anything to get their muscles to grow and one participant strongly agreed with this statement. Thus, Table 13 shows a high indication of possible MD symptomatology for these seven participants.

Additional findings, unrelated to the hypotheses proposed in this study, are also noteworthy. First, correlational analysis showed that the relationship between perfectionism and self-esteem was significant ($r = -.28$, $p < .01$). Therefore, participants who indicated higher levels of perfectionistic qualities showed lower levels of self-esteem. Further, the relationship between perfectionism and media influence was also significant ($r = .38$, $p < .05$). Thus, participants with

higher levels of perfectionistic qualities were more likely to be influenced by the media's portrayal of body image.

Chapter V

Discussion

This chapter presents the central findings obtained from the statistical analyses in the present study. It also presents the implications of these findings, limitations of the research, and suggestions for future research related to this area of study.

Key Findings

The goal of the present study was to examine the prevalence of Muscle Dysmorphia (MD) among male adolescent student athletes and its relation to sport participation, athletic and academic performance, as well as self-esteem, perfectionist qualities, media influence, and substance use.

The current study showed that male high school student athletes, ages 14 to 18, exhibit MD symptoms. Further analysis showed a positive relationship between MD symptomatology and perfectionistic qualities. Male adolescent athletes with higher levels of MD symptoms also demonstrated higher levels of perfectionism. A positive relationship was also found between MD symptomatology and media influence. Thus, male high school athletes with greater MD symptoms indicate a greater influence from the media to focus on body image. The study did not, however, find an association between students' MD symptom endorsement and their academic or athletic performances.

One of the goals of the present study was to see if MD symptoms that are common among adult male athletes, particularly those who participate in power sports, weightlifting, and bodybuilding (Baghurst & Lirigg, 2009; Cafri et al., 2008; Cafri et al., 2006; Lantz et al., 2002), are also present in male high school sports participants. Previous research by Olivardia et al. (2000), who investigated MD symptomatology among weightlifters aged 18-30, found that the

mean age of onset of MD was 19.4 years (*SD* = 3.6). The current study found that male student athletes showed MD symptomatology as young as age 14. Participants at age 15 showed the highest mean number of MD symptoms in this study, and had significantly higher MD symtomatology than participants at ages 17 and 18. The higher number of symptoms for 15 year olds was most likely due to their greater preoccupation with self-image at the earlier end of adolescence. Furthermore, students at age 15 are at the beginning of their high school sports careers and the start of the competitive sports. Thus, they may be more willing to take actions to build musculature in order to become more successful athletes and possibly take more drastic measures to do so because they are unsure of athletic expectations. Last, sophomores showed the highest mean of MD symptomotology most likely due to the fact that students can be recruited for college sports teams as early as their sophomore season, and the heightened pressure to perform at one's best possibly contributes to increased MD symptomatology.

These findings speak to the importance of addressing MD symptoms in high school. Although current students on average did not endorse high numbers of MD symptoms, the range of symptoms indicated that some students may be at risk to develop the disorder. Thus, the high school years would seem to be a prime time to take preventative measures so that students do not develop MD in the future.

Current results revealed a positive correlation between MD symptomatology and perfectionistic qualities, specifically perfectionism related to concern over making mistakes (Buhlman et al., 2008; Sassaroli et al., 2008), the subscale of the Multidimensional Perfectionism Scale (MPS; Frost et al., 1990) used in this study. This relationship is commensurate with findings of previous research with adult male athletes (Buhlmann et al., 2008; Davis et al., 2005; Kuennen & Waldron, 2007; Sassaroli et al., 2008). It is not surprising that individuals who are

preoccupied with appearing big and strong are also concerned with not making mistakes. After all, mistakes can easily be interpreted as a sign of weakness, something that individuals with MD want to avoid. It is easy to speculate then that individuals with these preoccupations may resort to drastic means, such as using performance enhancing drugs, to gain strength and avoid mistakes. Thus, it is important that the current study found a similar association between perfectionism and MD symptoms to that found in adult male athletes with MD.

Research with adult males with MD indicates that this population also presents with high incidences of OCD symptoms (Chandler et al., 2009; Maida & Armstrong, 2005; Wolke & Sapouna, 2008). Ye et al. (2008) found a high incidence of perfectionist qualities, particularly sensitivity to making mistakes in school-aged individuals diagnosed with OCD. The current study did not ask participants about OCD symptoms, so the relationship among MD and OCD symptoms and perfectionism could not be investigated in the sample.

The media presents strong, muscular bodies as ideal for men. Strong men are frequently depicted on television and movies as successful in all of life's activities. It is not surprising then that MD symptoms are associated with being influenced by the media. The positive relationship between MD symptomatology in this sample of male high school athletes and media influence supports previous research that found that adolescents' media engagement is associated with the prevalence MD symptomatology (Cafri et al., 2006). Cafri et al. (2006) found that media influence and power sports participation predicted MD symptoms in male adolescents aged 13-18 years old. A study by Leit et al. (2002) further supported the association of media influence on males' attitudes about their body appearance; however, Leit et al.'s sample consisted of older participants (i.e., college males). Leit et al. (2002)'s findings suggested males that who view media male body representations that are muscular and attractive may be more likely to have

MD symptoms because of their concentration on the ideal level of muscularity, a key component of MD (Pope et al., 1997). The current research supports Leit el al.'s findings and expands the research substantiating the positive relationship between MD symptomatology and media influence to include male adolescents.

Previous research has shown that individuals with MD symptomatology, over the age of 18, also experienced low self-esteem (Chaney, 2008; Olivardia et al., 2004; Philips et al., 2004). However, the present study did not find a significant negative correlation between MD symptomatology in male high school athletes and self-esteem. Nonetheless, the relationship between MD symptoms and self-esteem did show the predicted negative directionality; thus, if the sample size were larger, results may have been significant.

Research has shown that individuals from college-age through adulthood with MD symptoms commonly use performance-enhancing drugs that include muscle building supplements and/or steroids (Baghurst & Lirigg, 2009; Cole, Smith, Halford, & Wagstaff, 2003; Kanayama, Barry, Hudson, & Harrison, 2006; Olivardia et al., 2000; Olivardia et al., 2004). In accordance with these findings, in this study I hypothesized that symptoms of MD would be positively related to students' perception that it is okay to use performance-enhancing products to add muscle mass. Nonetheless, I was unable to test this hypothesis because the overwhelming majority of participants reported that they did not find it acceptable to use performance-enhancing products. Although few participants indicated that they would be willing to use performance-enhancing drugs, 10% of participants indicated that they "…would do anything to get their muscles to grow." This admission from a handful of participants is alarming, because it signals that these teens may be on their way to doing physical damage to themselves for the sake of their appearance and performance.

Researchers investigating Muscle Dysmorphia have not studied the relationship of MD symptoms to athletic or academic performance among adolescent males. Results of studies with male adults (Baghurst & Lirigg, 2009; Cole et al., 2003; Kanayama et al., 2006; Olivardia et al., 2000; Olivardia et al., 2004) led me to believe that high school athletes who believe their performances are subpar may develop MD symptoms to try to better their athletic performances. In contrast, I also thought that athletes who are performing at a higher level may develop MD symptoms to maintain good performance. I was not able to test these assumptions, but I did look for a relationship MD symptomatology and athletic performance and found none. Further, I hypothesized that male secondary athletes' academic achievement might also be related to MD symptoms, however, results did not reveal any significant correlations.

Implications for School Psychologists

Investigation of MD within the school-aged athlete population is minimal. Thus current findings provide information that indicates the need for school programs and treatments to address MD symptoms and their correlates. Although Olivardia et al. (2000) found the mean age of onset of MD is 19.4 +/- 3.6 years, the present study provides evidence of MD symptomatology as early as age 14, and more frequent at age 15. Thus, male student-athletes exhibit the preoccupation with self-image, muscularity, and exercising at an earlier age than expected and could be putting themselves at risk for health complications and emotional distress.

The positive relationship between MD and perfectionism, specifically concern over mistakes, reveals that male secondary school students who put pressure on themselves to avoid imperfection may also display elevated anxiety to maintain a favorable impression among peers when it comes to their appearance. Participation in sports may increase the anxiety because of pressure to perform well for others. Although unrelated to my hypotheses, the current study also

found that perfectionism and self-esteem were negatively related. Therefore, those with perfectionistic tendencies may show low levels of self-esteem, adding to emotional difficulties.

Male high school student athletes also look to the media and compare themselves to the athletes depicted on television, in magazines, or on the web. The positive relationship between MD symptoms and media influence found in this study demonstrates that adolescent males are not satisfied with themselves and need to rely on an external source to help guide their behavior. Those with perfectionistic qualities also showed a positive relationship with media influence. Therefore, male secondary students who look to the media for self-affirmation in regard to their appearance are understandably also concerned that they will lose the respect of others as a result of imperfection.

The prevalence of MD symptomatology among male adolescent athletes has important implications for school psychologists who can make meaningful contributions in the school system to assist these students. First, school psychologists should provide professional development to athletic directors, physical education, health teachers, and coaches to increase their understanding of MD. This education should include education about MD symptomatology, and the possible long-term consequences of this disorder.

Insight into understanding the male struggle with self-image at the secondary level will provide school professionals such as athletic directors, health teachers, physical education teachers, and coaches with necessary information to address these issues with young male athletes. For example, school psychologists should guide coaches by explaining that they should monitor their male athletes' work-out schedules and note if students are exercising too often or becoming preoccupied with building muscle mass. Coaches should note the male athletes who are particularly hard on themselves and work hard to perform well and avoid mistakes because

these students may be more inclined to exhibit MD symptoms. Coaches should contact the school psychologist if they believe any players are exhibiting extreme preoccupations with exercising or muscle building. The school psychologist should meet with these students, provide them with appropriate counseling, and contact parents so they can work together to assist the student.

School psychologists may also suggest Cognitive Behavioral Therapy (CBT) for adolescents suffering from MD symptomatology because CBT is effective in treating Body Dysmorphic Disorder (BDD) (Philips, et al., 1998; Rosen et al., 1995; Wilhelm et al., 2011), and MD is a subtype of BDD (DSM-IV-TR; American Psychiatric Association, 2000). It is important to note that there are no empirically validated treatments for Muscle Dysmorphia (Olivardia, 2001), nor for adolescent males with MD symptoms. Therefore, school psychologists should contact cognitive behavioral therapists prior to making referrals to ensure that therapists have proper training to deal with disorders similar to MD such as BDD.

Furthermore, MD and eating disorders seem to be closely related (Olivardia et al., 2000), and CBT is an effective treatment for eating disorders as well (Grave, Doll, & Fairburn, 2013; Serfaty, Turkington, Ledsham, & Jolley, 1990). MD is referred to as "Reverse Anorexia Nervosa" because of its similarities to certain characteristics of Anorexia Nervosa (Pope et al., 1993). Individuals suffering from Anorexia Nervosa and/or MD show a preoccupation with appearance, experience extreme stress and anxiety, hide their bodies in oversized clothing, participate in compulsive behaviors including specific eating rituals, and engage in self-destructive behaviors (Olivardia et al., 2000). Thus school psychologists should ask cognitive behavioral therapists about their experience in treating eating disorders in order to make appropriate referrals for treatment of MD.

Because MD symptoms are associated with other concerns such as perfectionism and low self-esteem, psychologists should target these symptoms for treatment as well. CBT also works well for adolescents who are perfectionistic and have low self esteem (Shirk, Burwell, & Harter, 2006).

School psychologists should also take a more active role in curriculum development, especially in the area of health education. Because of the incidence of MD and its relationship with eating disorders, information about the disorder should be presented to students as part of the health education. This information should include education about the negative effects of engaging in excessive exercising and using performance-enhancing drugs. Moreover, the positive relationship between media influence and MD requires that teachers inform students of the realistic expectations for the male adolescent body and help them to avoid comparisons with the body types portrayed in the media.

School psychologists may not be able to fulfill these tasks easily. In US culture, there is great pressure for athletes to achieve. Coaches are also under pressure to produce winning teams even at the high school level. MD symptoms may actually facilitate athletic performance at least in the short term, and there are many examples in the media of athletes who take performance-enhancing drugs and become superstars. Even those who are caught cheating in this way leave behind impressive records for others to emulate.

Limitations of the Present Study and Suggestions for Future Research

Social desirability. Male adolescent self-image is a highly sensitive subject matter. Therefore, social desirability bias could have influenced the present results. Adolescents do not want to admit their attitudes and behavior because they are afraid of the possible scrutiny and negative consequences. Further, parents usually do not want to admit that their adolescent

children may suffer from these issues, thus they are more likely not to grant consent for a study like the present one. Last, coaches are focused on strengthening their athletes so their sports teams win. Thus, they may not want to participate in a study that is aimed at revealing the negative ramifications of unhealthy workout schedules, diets, and muscle-building activities. For the above reasons, participants may not have assessed their behavior accurately, parents may not have granted consent for their children's participation, and coaches may not have collaborated with the experimenter to include their athletes in the present research. Throughout the recruitment process, I struggled to attain parental consents and many coaches did not respond to my inquiries to assess the athletes on their teams; thus social desirability may have negatively affected the sample size.

Although social desirability was most likely a factor in the present study, attempts were made to minimize these issues. Participants in the pilot study seemed to respond to the questionnaire in a socially desirable way. For example, their self-esteem scores approached a statistical ceiling, and none of the variables demonstrated a relationship with MD symptoms. It seemed that the pilot questionnaire telegraphed the study's intent, and the presence of the researcher in the room during questionnaire administration may have led participants to present themselves in a positive way.

The dissertation attempted to address these problems by adding filler items to the questionnaire, mixing up the items for the scales instead of presenting them clustered together for each scale, and having the researcher leave the room during questionnaire administration. The changes from the pilot appear to have addressed at least some of the socially desirable responding. The self-esteem scores for the dissertation are within normal limits and not excessively high as they were in the pilot. In addition, the correlations are in the expected

directions and are in agreement with what was hypothesized. Further, the supplementary results make logical sense. For instance, in the literature, low self-esteem is often associated with perfectionism (Shirk et al., 2006), and this holds true for this study as well. The positive correlation between perfectionism and media influence also provides support for idea that participants may not have responded in a socially desirable way, but instead responded in a more probable way. Thus, it seems that participants in this study responded to the questionnaire items more honestly than did participants in the pilot study. Because the study dealt with sensitive issues that are often met with social disapproval, some participants may still have responded in more socially desirable ways. Future researchers might incorporate social desirability items in their questionnaires to examine this possibility.

Despite the difficulties associated with the social desirability that permeate the study of MD, the results show that some adolescents who play sports have MD symptoms and these symptoms are related to further problems that should be treated.

Other limitations. There are several additional limitations to the current study. The first limitation was the number of participants. The final sample contained 67 participants (20.74% of those solicited). I distributed, mailed, and/or emailed 323 parental consent forms, however, I only received 74 (22.91% return rate) of them back from parents. Furthermore, 7 students for whom I received parental permission were absent at the time of the questionnaire administration. Thus, they were unable to complete the questionnaire. Although significant results were found, a larger sample may have produced more valuable results. While this sample provided sufficient information for a first step in this area of research, there is a need for a much broader sample and larger numbers of participants in order to verify and extend these findings.

Many factors contributed to the small sample size in the present study. First, one of high schools from which I recruited participants had only 416 students. Thus, in recruiting only males who participated in sports, the potential sample size was limited. The second high school from which I recruited participants contained 1,455 students. However, in this school I recruited from the lacrosse, football, and ice hockey teams only, thus limiting my potential sample size. I recruited from only these sports teams because these were the coaches that responded to my inquiries and collaborated in my efforts. Unfortunately, gaining school district approval was a difficult and time-consuming process. Certain coaches were more responsive to assisting in this research than were others. Therefore, I worked hard to gain as many participants as possible from the districts and teams that were the most forthcoming.

A second limitation was that the number of participants in each sport varied significantly from 1 participant on the golf team to 16 participants on the ice hockey team. A more uniform number of players from each team would have provided a more equalized sample and possibly more significant results. Larger and more uniform numbers of athletes in each sport would also have allowed comparisons between sports on study variables. Future research should focus on gaining a more consistent number of participants from each sports team.

A third study limitation was the limited socio-economic diversity of the present participant sample. Only 6 of the 67 participants (8.96% of the sample) received reduced or free lunch. Thus, the sample had very few participants of lower socio-economic status. One factor that contributed to the limited amount of lower SES participants was that the two school districts from which participants were recruited were located in middle class suburban areas. Thus, few students fit into the lower SES category. Further, some participants of lower SES spoke Spanish and the parental consent forms were presented in English, contributing to the low recruitment

response rate. Last, middle class parents most likely had higher-level educational background, and may have been more interested in contributing to the present study because they valued academic research. More parents from the higher SES in the community signed parental consents and offered student participation in the study. Future research should include parental consents translated in Spanish to ensure that all parents adequately understand the study and are more likely to grant student participation.

A fourth limitation was in the items that made up the questionnaire. The questionnaire contained two repeated items: number 44 from the perfectionism subscale "People will probably think less of me if I make a mistake" and number 50 from the muscle dysmorphia subscale "To get big, one must be able to ignore a lot of pain." First, participants may have altered their answers because they saw the same items twice or realized the pattern of items. Second, the repetition of items in each subscale reduced the validity of the perfectionism and muscle dysmorphia measures. Last, I attempted to include a somewhat similar amount of items for each subscale that were randomly distributed throughout the questionnaire. However, the repeated items created more variability between each subscale, thus possibly skewing results. In future studies, the structure of the questionnaire should be reviewed more carefully to avoid repetition of items.

A fifth limitation was in the coach evaluation scale. Some coaches struggled to rate their athletes because of the arrangement of the rating scale. Coaches rated the athletic performance of each participant on a 4-point Likert scale (3 = *Exceptional,* 2 = *Average,* 1= *Good,* 0 = *Weak*). Some coaches reported to me that they believed "Good" players were better than "Average" players, thus the rating scale arrangement should have be altered to read (3 = *Exceptional*, 2 = *Good*, 1 = *Average*, 0 = *Weak*). The misunderstanding of the rating scale may have caused some

coaches to be swayed to rate their players incorrectly. Thus, their responses did not properly assess participants' athletic skills. Future studies should include a rating scale that more adequately represents the varied athletic performance of athletes and the rating scale should be constructed with collaboration from coaches.

All of these limitations can be addressed in future research that examines MD symptomatology in high school male athletes. A larger sample size that contains more participants from each sport who have a higher level of socio-economic diversity will enable a more thorough investigation of MD symptoms in high school athletes and allow results to be generalized to a broader population. A greater number of participants would also provide more significant findings between MD and variables such as self-esteem.

Future studies should also include female high school athletes. Although males are more likely to have MD symptoms, females are not exempt from MD. A study of both genders would allow comparisons between them. In addition, future studies should also include non-athletes so that comparisons can be made to the general population. This would provide information about normal levels of MD symptomatology in the population and allow for more accurate assumptions about the severity of MD issues.

Future research in this area should also include inquiries about the type of weight-training required for each sport. Many sports, especially power sports, require athletes to engage in frequent weight-training, thus this would affect the way in which participants assess their behaviors in relation to MD symptomatology. Athletes are required to weight-train; therefore, they may indicate higher levels of MD symptoms, specifically in the areas of working out. It is important to investigate the required training for each sport and to compare these results with MD symptomatology to determine accurately the severity of the issues.

Last, qualitative research may provide useful insight into the extent of MD symptomatology and behavior in the high school population. A study of high school sports may be best accomplished if the researcher enters the participants' school environment, sports practices, and sporting events to observe behaviors and daily trends. The researcher acting as a participant observer will help the students to become more comfortable with him or her, and reduce some social desirability bias during the study. Further, qualitative data could reveal the typical training involved when participating in sports and provide a baseline comparison to better access the severity of MD symptomatology among adolescents.

APPENDIX A

Letter to Superintendent/Board of Education

DATE

To _____Superintendent/Board of Education Members:

I am writing you to ask for your approval to conduct my dissertation research study with the students of _____. I am a Ph.D. student at the Graduate Center, CUNY and my study assesses wellness in male high school student athletes and its relationship to school performance.

Attached is a copy of my proposal, please look it over as it explains more thoroughly the purpose and procedures of my study. I would like to evaluate male junior varsity and varsity athletes, therefore after receiving your consent to proceed, I will contact the athletic director_____ for his approval. Next, I will meet with the coaches of high school sports to gain student addresses in order to send parental consents to parents for the project before beginning. Students who do not receive parent consent will not participate in the study. I will ask students to complete a brief questionnaire before or after a sport practice and I will contact the high school guidance counselors to ask to collect hard copies of participants' New York State Regents Exams scores in the areas of math and science to evaluate students' academic performance. I look forward to pursuing this study and relaying my findings to the district which will help faculty and students to design school improvement initiatives. Please feel free to contact me with any questions or concerns. Thank you for time.

Sincerely,

Michelle Lividini, Ed.M., M.Phil.
Certified School Psychologist
Rye Neck Middle School
914-777-4867
mlividini@ryeneck.k12.ny.us

APPENDIX B

Athletic Director Script

Mr./Ms./Dr._____

My name is Michelle Lividini and I am a Ph.D. graduate student at The Graduate Center, City University of New York and currently a school psychologist at Rye Neck Middle School. I am contacting you to ask for approval to conduct my research study with the students of _____ High School, particularly male athletes at the Junior Varsity and Varsity levels. My dissertation assesses wellness in male high school student athletes and its relationship to school and athletic performance.

After receiving your consent to proceed, I will meet with the coaches of high school sports. I will explain my study to coaches and if they express interest, I will ask them to provide me with a list of athletes on each of their teams in order to send parents consent for student participation in the project. Parents will be asked to consent to students completing a questionnaire, give permission for coaches to evaluate athletic performance as well as for me to gather student's Regents test grades. I have a copy of the parental consent for you to review.

I will re-contact coaches of the sports teams once I receive parental consent forms and ask to meet with the students who have parental consent to participate in the study. Those students whose parents do not sign consent forms will not participate. I will speak with the coach to set up a meeting time after school hours and at a team practice to meet with student athletes. At the meeting I will explain the study to the students in a group setting. Afterwards, I will give assent forms to students and read the contents aloud which explain the study procedure in detail. I will ask the students to read along and sign assent forms if they are willing to participate. I will answer any questions related to the procedure. I will emphasize that students can discontinue their participation at any point. I will distribute the questionnaire to students that will take around 10 minutes to complete. I will ask coaches to complete a brief survey to evaluate students' athletic performance and collect Regents test grades in the areas of math and science to assess academic performance.

I look forward pursuing this study and relaying my findings to the district which will help faculty and students to design school improvement initiatives.

Thank you for your assistance.

APPENDIX C

Coach Script

Mr./Ms./Dr._____

My name is Michelle Lividini and I am a Ph.D. graduate student at The Graduate Center, City University of New York and currently a school psychologist at Rye Neck Middle School. I am contacting you to ask to conduct my dissertation study with you junior varsity/varsity athletes. I have received permission from your Athletic Director. My dissertation assesses wellness in male high school student athletes and its relationship to school and athletic performance.

Parents of athletes will be asked to consent to students completing a questionnaire, give permission for you to evaluate athletic performance as well as for me to gather student's Regents test grades. I have a copy of the parental consent for your review. I would need to ask you to provide a list of athletes on your team in order to send parents consent for student participation in the project. Once I receive parental consent forms, I would need your permission to meet with the students who have parental consent after school hours and before a team practice. I will distribute the questionnaire to students that will take around 10 minutes to complete.

I will ask for you to evaluate your junior varsity/varsity students' athletic performance as: exceptional, good, average, or weak. This evaluation should take about 2 minutes. All information gathered will be kept strictly confidential, and will be stored in a locked file cabinet, to which only I, and my advisor, will have access. At any time you can refuse to answer any questions or end the evaluation.

I look forward pursuing this study and relaying my findings to the district which will help faculty and students to design school improvement initiatives. Thank you for your participation.

APPENDIX D

Coach Consent Form

My name is Michelle Lividini and I am a doctoral student in the Educational Psychology Department at the Graduate Center, City University of New York conducting a study on wellness in male high school student athletes and its relationship to school performance. Parents/guardians have given permission for you to evaluate the students' athletic performance as: exceptional, good, average, or weak. I am recruiting 100 students to participate in this study to expand the knowledge of health and wellness among male student athletes at the high school level and the effects on school and athletic performance.

This evaluation should take approximately 10 minutes to complete for all students. All information gathered will be kept strictly confidential, and will be stored in a locked file cabinet, to which only I, and my advisor, will have access. At any time you can refuse to answer any questions or end the evaluation.

The risks involved in this study are no more than those encountered in everyday life. The benefit of this study is that your data will provide a better understanding about wellness and performance in high school athletes.

If you would like a copy of the study, please provide me with your address and I will send you a copy in the future.

If you have any questions about this research you can contact me at 914-777-4867 or mlividini@ryeneck.k12.ny.us., or my advisor Dr. Tryon at 212-817-8293 or gtryon@gc.cuny.edu. If you have any questions about your rights as a participant in this study, you can contact Kay Powell, IRB Administrator, The Graduate Center/City University of New York, 212-817-7525, kpowell@gc.cuny.edu. Thank you for your participation. Please sign below.

_____	_____	_____	_____
Participant's Signature	Date	Investigator's signature	Date

I would like a copy of this study when it is completed:

Name _____
Address _____
_____
Email _____

APPENDIX E

Parent/Guardian Permission Form

To Parents/Guardians:

My name is Michelle Lividini and I am a doctoral student in the Educational Psychology Department at the Graduate Center, City University of New York conducting a study on wellness in male high school student athletes and its relationship to school performance. I am recruiting 100 students to participate in this study to expand the knowledge of health and wellness among male student athletes at the high school level. Participation will help faculty and students design school improvement initiatives.

Your child will complete a 10-minute questionnaire after school hours and with your permission, I would like to obtain his/her current grades and the coach's evaluation of his/her athletic performance. All information gathered will be kept strictly confidential, and will be stored in a locked locker, to which only I, and my advisor, will have access. Participation is voluntary, your child may withdraw at any time, and not participating will have no effect on his/her school status. If you would like a copy of the study, please provide me with your address and I will send you a copy in the future.

If you have any questions about this research you can contact me at 914-777-4867 or mlividini@ryeneck.k12.ny.us., or my advisor Dr. Tryon at 212-817-8293 or gtryon@gc.cuny.edu. If you have any questions about your child's rights as a participant in this study, you can contact Kay Powell, IRB Administrator, The Graduate Center/City University of New York, 212-817-7525, kpowell@gc.cuny.edu.

I hope to obtain your support for my research endeavors. If you could sign below the dotted line and mail the completed form in the return envelope attached, it would be greatly appreciated.

Thank you,

Michelle Lividini, Ed.M., M. Phil.
Rye Neck Middle School
School Psychologist

I give my child _____ permission to participate in the above described research study.

_____ _____
Signature of Parent/Guardian Date

_____ _____
Investigator's signature Date

I agree for the school psychologist to obtain my child's Regents test grades in math and/or science and to request the coach's evaluation of the child's performance.[circle one]: **YES NO**

My child receives free/reduced lunch: [circle one] **YES NO** **OVER…**

I would like a copy of this study when it is completed:
Name _____
Address _____
_____
Email _____

APPENDIX F

Parent/Guardian Permission Form

To Parents/Guardians:

My name is Michelle Lividini and I am a doctoral student in the Educational Psychology Department at the Graduate Center, City University of New York conducting a study on wellness in male high school student athletes and its relationship to school performance. I am recruiting 100 students to participate in this study to expand the knowledge of health and wellness among male student athletes at the high school level. Participation will help faculty and students design school improvement initiatives.

Your child will complete a 10-minute questionnaire after school hours and with your permission, I would like to obtain his/her current grades and the coach's evaluation of his/her athletic performance. All information gathered will be kept strictly confidential, and will be stored in a locked locker, to which only I, and my advisor, will have access. Participation is voluntary, your child may withdraw at any time, and not participating will have no effect on his/her school status. If you would like a copy of the study, please provide me with your address and I will send you a copy in the future.

If you have any questions about this research you can contact me at 914-777-4867 or mlividini@ryeneck.k12.ny.us., or my advisor Dr. Tryon at 212-817-8293 or gtryon@gc.cuny.edu. If you have any questions about your child's rights as a participant in this study, you can contact Kay Powell, IRB Administrator, The Graduate Center/City University of New York, 212-817-7525, kpowell@gc.cuny.edu.

I hope to obtain your support for my research endeavors. If you could sign below the dotted line and email the completed form with your signature as an attachment to mlividini@ryeneck.k12.ny.us, it would be greatly appreciated.

Thank you,

Michelle Lividini, Ed.M., M. Phil.
Rye Neck Middle School
School Psychologist

I give my child _____ permission to participate in the above described research study.

_____ _____
Signature of Parent/Guardian Date

_____ _____
Investigator's signature Date

I agree for the school psychologist to obtain my child's Regents test grades in math and/or science and to request the coach's evaluation of the child's performance.[circle one]: **YES** **NO**

My child receives free/reduced lunch: [circle one] **YES** **NO**

OVER…

I would like a copy of this study when it is completed:

Name _____
Address _____
_____
Email _____

APPENDIX G

Student Assent Form

My name is Michelle Lividini and I am a doctoral student in the Psychology Department at the Graduate Center, City University of New York conducting a study on wellness in male high school student athletes and its relationship to school performance. I am recruiting 100 students to participate in this study to expand the knowledge of health and wellness among male student athletes at the high school level. I am requesting that you complete a 5-page questionnaire and circle your response to the statements presented. I am also asking to obtain your **Regents test grades in math and science and for your coach to evaluate your athletic performance**. Your parents have given permission for you to participate in this study, however you can choose not to participate. Participation is not mandatory and non-participation will have no negative consequences.

This questionnaire should take approximately 10 minutes. All information gathered will be kept strictly confidential, and will be stored in a locked file cabinet, to which only I, and my advisor, will have access. At any time you can refuse to answer any questions or end the survey.

The risks involved in this study are no more than those encountered in everyday life. The benefit of this study is that your data will provide a better understanding of wellness and performance in male high school athletes. If you would like a copy of the study, please provide me with your address and I will send you a copy in the future.

If you have any questions about this research you can contact me at 914-777-4867 or mlividini@ryeneck.k12.ny.us., or my advisor Dr. Tryon at 212-817-8293 or gtryon@gc.cuny.edu. If you have any questions about your rights as a participant in this study, you can contact Kay Powell, IRB Administrator, The Graduate Center/City University of New York, 212-817-7525, kpowell@gc.cuny.edu.

Thank you for your participation in the study.

_____	_____	_____	_____
Participant's Signature	Date	Investigator's signature	Date

I give permission for you to obtain **my science and/or math Regents** test grades and for my coach to evaluate my athletic performance. [circle one] YES NO

I would like a copy of this study when it is completed:

Name _____
Address _____
_____
Email _____

APPENDIX H

Questionnaire

Wellness of Male Athletes

Please answer the following questions:

1. Current sport_____
2. Age___
3. Grade_____
4. List other sports played_____

For each statement below, please circle one of the following responses:

Strongly Agree Agree Disagree Strongly Disagree

1. I can solve most problems if I invest the necessary effort.	Strongly Agree	Agree	Disagree	Strongly Disagree
2. I've felt pressure from TV or magazines to look muscular.	Strongly Agree	Agree	Disagree	Strongly Disagree
3. If my schedule forces me to miss a day of working out with weights, I feel very upset.	Strongly Agree	Agree	Disagree	Strongly Disagree
4. If someone does a task at school better than I, then I feel like I failed the whole task.	Strongly Agree	Agree	Disagree	Strongly Disagree
5. I feel that I do not have much to be proud of.	Strongly Agree	Agree	Disagree	Strongly Disagree
6. When I am confronted with a problem, I can usually find several solutions.	Strongly Agree	Agree	Disagree	Strongly Disagree
7. I've felt pressure from TV or magazines to have a perfect body.	Strongly Agree	Agree	Disagree	Strongly Disagree
8. The fewer mistakes I make, the more people will like me.	Strongly Agree	Agree	Disagree	Strongly Disagree
9. I often find it difficult to resist checking the size of my muscles.	Strongly Agree	Agree	Disagree	Strongly Disagree
10. I certainly feel useless at times.	Strongly Agree	Agree	Disagree	Strongly Disagree

11. I wish I looked as athletic as sports stars.	Strongly Agree	Agree	Disagree	Strongly Disagree
12. I can always manage to solve difficult problems if I try hard enough.	Strongly Agree	Agree	Disagree	Strongly Disagree
13. If I do not do as well as other people, it means I am an inferior human being.	Strongly Agree	Agree	Disagree	Strongly Disagree
14. I would try anything to get my muscles to grow.	Strongly Agree	Agree	Disagree	Strongly Disagree
15. At times I think I am no good at all.	Strongly Agree	Agree	Disagree	Strongly Disagree
16. I am confident that I could deal efficiently with unexpected events.	Strongly Agree	Agree	Disagree	Strongly Disagree
17. I've felt pressure from TV or magazines to lose weight.	Strongly Agree	Agree	Disagree	Strongly Disagree
18. People will probably think less of me if I make a mistake.	Strongly Agree	Agree	Disagree	Strongly Disagree
19. I often ignore a lot of physical pain while I am lifting to get bigger.	Strongly Agree	Agree	Disagree	Strongly Disagree
20. I feel that I am a person of worth, at least on an equal plan with others.	Strongly Agree	Agree	Disagree	Strongly Disagree
21. I compare my body to that of people in "good shape."	Strongly Agree	Agree	Disagree	Strongly Disagree
22. I can usually handle whatever comes my way.	Strongly Agree	Agree	Disagree	Strongly Disagree
23. I hate being less than the best at things.	Strongly Agree	Agree	Disagree	Strongly Disagree
24. I am satisfied with the size of my muscles.	Strongly Agree	Agree	Disagree	Strongly Disagree
25. All in all, I am inclined to feel that I am a failure.	Strongly Agree	Agree	Disagree	Strongly Disagree

26. I've felt pressure from TV or magazines to be muscular.	Strongly Agree	Agree	Disagree	Strongly Disagree
27. If someone opposes me, I can find the means and ways to get what I want.	Strongly Agree	Agree	Disagree	Strongly Disagree
28. If I fail at school, I am a failure as a person.	Strongly Agree	Agree	Disagree	Strongly Disagree
29. I often seek reassurance from others that my muscles are big enough.	Strongly Agree	Agree	Disagree	Strongly Disagree
30. I feel that I have a number of good qualities.	Strongly Agree	Agree	Disagree	Strongly Disagree
31. I compare my body to that of people who are athletic.	Strongly Agree	Agree	Disagree	Strongly Disagree
32. Thanks to my resourcefulness, I know how to handle unforeseen situations.	Strongly Agree	Agree	Disagree	Strongly Disagree
33. I've felt pressure from TV or magazines to diet.	Strongly Agree	Agree	Disagree	Strongly Disagree
34. If I do not do well all the time, people will not respect me.	Strongly Agree	Agree	Disagree	Strongly Disagree
35. I often feel like I am addicted to working out with weights.	Strongly Agree	Agree	Disagree	Strongly Disagree
36. I take a positive attitude toward myself.	Strongly Agree	Agree	Disagree	Strongly Disagree
37. I've felt pressure from TV or magazines to change my appearance.	Strongly Agree	Agree	Disagree	Strongly Disagree
38. It is easy for me to stick to my aims and accomplish my goals.	Strongly Agree	Agree	Disagree	Strongly Disagree
39. I should be upset if I make a mistake.	Strongly Agree	Agree	Disagree	Strongly Disagree
40. It is okay to use performance-enhancing products to add muscle mass.	Strongly Agree	Agree	Disagree	Strongly Disagree

41. On the whole, I am satisfied with myself.	Strongly Agree	Agree	Disagree	Strongly Disagree
42. I wish I looked as athletic as people in magazines.	Strongly Agree	Agree	Disagree	Strongly Disagree
43. I can remain calm when facing difficulties because I can rely on my coping abilities.	Strongly Agree	Agree	Disagree	Strongly Disagree
44. People will probably think less of me if I make a mistake.	Strongly Agree	Agree	Disagree	Strongly Disagree
45. To get big, one must be able to ignore a lot of pain.	Strongly Agree	Agree	Disagree	Strongly Disagree
46. I've felt pressure from TV or magazines to exercise.	Strongly Agree	Agree	Disagree	Strongly Disagree
47. I am able to do things as well as other people.	Strongly Agree	Agree	Disagree	Strongly Disagree
48. If I am in trouble I can usually think of a solution.	Strongly Agree	Agree	Disagree	Strongly Disagree
49. I try to look like sports athletes.	Strongly Agree	Agree	Disagree	Strongly Disagree
50. To get big, one must be able to ignore a lot of pain.	Strongly Agree	Agree	Disagree	Strongly Disagree
51. I wish I could have more respect for myself.	Strongly Agree	Agree	Disagree	Strongly Disagree

Note: Distracter Items
Self-Esteem Items
Perfectionism Items
Media Influence Items
Muscle Dysmorphia Items

APPENDIX I

Student Script

Hello Student(s)

My name is Michelle Lividini and I am a Ph.D. graduate student at The Graduate Center, City University of New York and currently a school psychologist at Rye Neck Middle School. My dissertation assesses wellness in male high school student athletes and its relationship to school and athletic performance. Here is a consent form for you to read along as I explain my study.

I am requesting that you complete a 5-page questionnaire and circle your response to the statements presented. I am also asking to obtain **your Regents test grades in math and science and for your coach to evaluate your athletic performance.** Your parents have given permission for you to participate in this study. Participation is not mandatory and non-participation will have no negative consequences.

This questionnaire should take approximately 10 minutes. All information gathered will be kept strictly confidential, and will be stored in a locked file cabinet, to which only I, and my advisor, will have access. At any time you can refuse to answer any questions or end the survey.

The risks involved in this study are no more than those encountered in everyday life. The benefit of this study is that your data will add to my knowledge about this topic, however there are not any direct benefits to you as a participant. If you would like a copy of the study, please provide me with your address and I will send you a copy in the future.

If you have any questions about this research you can contact me at 914-777-4867 or mlividini@ryeneck.k12.ny.us., or my advisor Dr. Tryon at 212-817-8293 or gtryon@gc.cuny.edu. If you have any questions about your rights as a participant in this study, you can contact Kay Powell, IRB Administrator, The Graduate Center/City University of New York, 212-817-7525, kpowell@gc.cuny.edu.

Please sign the consent form if you are willing to participate.

Please complete the questionnaire honestly and leave the completed form on a table in the front of the room before exiting. Thank you for your participation in the study.

APPENDIX J

Coach Evaluation

Please identify the athlete's performance by circling *Weak*, *Good, Average*, or *Exceptional* below.

Student Name

________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional
________________________________	Weak	Good	Average	Exceptional

APPENDIX K

Guidance Counselor Script

Mr./Ms./Dr._____

My name is Michelle Lividini and I am a Ph.D. graduate student at The Graduate Center, City University of New York and currently a school psychologist at Rye Neck Middle School. I am contacting you to ask for access to junior varsity and varsity student athletes' Regents test grades in math and science who have participated in my study. My dissertation assesses wellness in male high school student athletes and its relationship to school and athletic performance.

Parents of athletes will be asked to consent to students completing a questionnaire, give permission for coaches to evaluate athletic performance as well as for me to gather student's Regents test grades. I have a copy of the parental consent for your review.

All information gathered will be kept strictly confidential, and will be stored in a locked file cabinet, to which only I, and my advisor, will have access. At any time you can refuse to answer any questions or end the evaluation.

Thank you for your assistance.

APPENDIX L

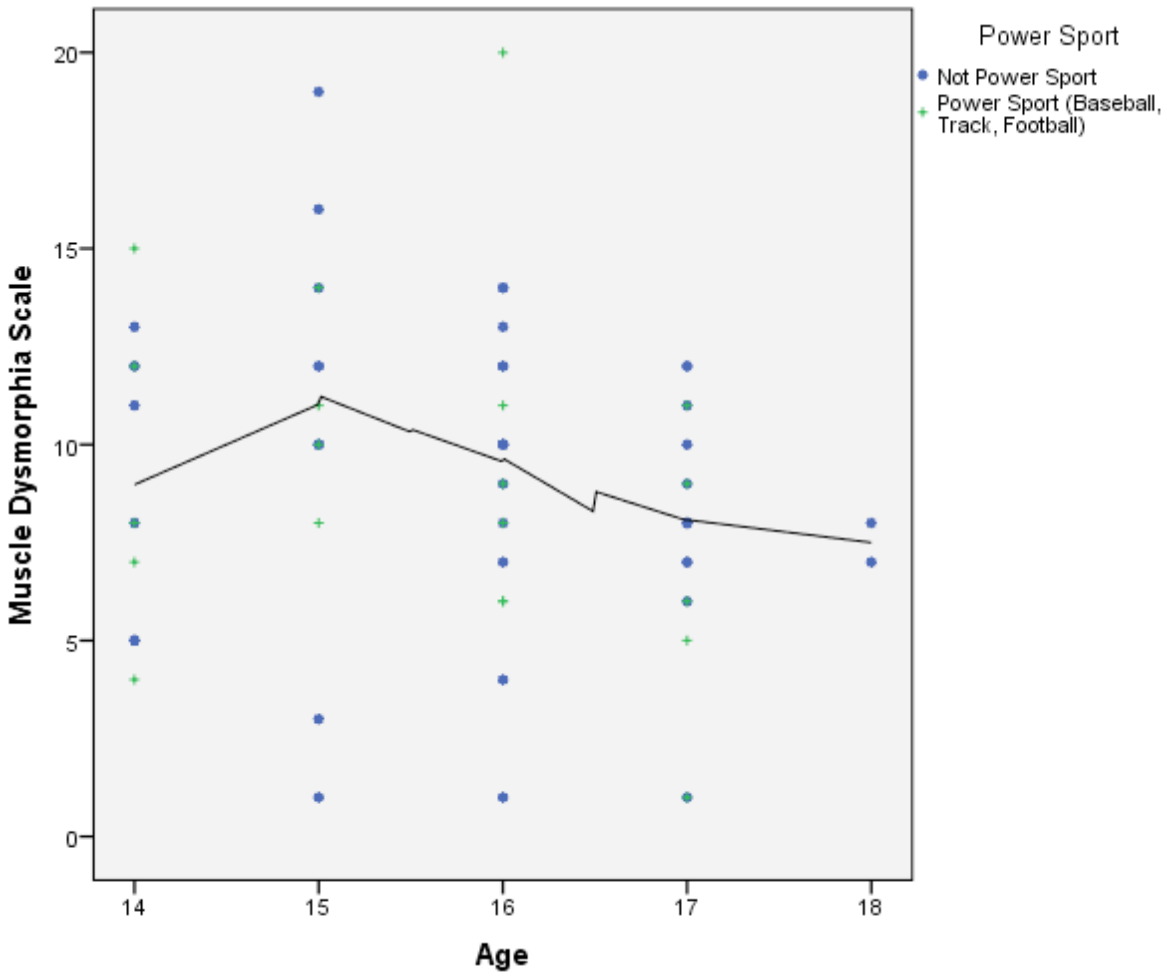

Figure 1. Mean Muscle Dysmorphia symptoms as a function of age and power sport vs. non-power sport.

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