

Muscle Dysmorphia:

Under-researched and potentially Over-diagnosed

Muscle Dysmorphia is a recently described psychiatric disorder, characterized by a pathological preoccupation with muscle size. [1] This paper aims to define Muscle Dysmorphia and explore its aetiology and ramifications, including psychological distress and an association with the use and abuse of Androgenic Anabolic Steroids. Muscle Dysmorphia is often referred to as a subtype of Body Dysmorphia, with features that correlate with an Eating Disorder and Obsessive-Compulsive Disorder. I will look into the diagnostic criteria of these disorders, and highlight the suggested similarities they share with Muscle Dysmorphia. I believe there is a lack of definitive diagnostic criteria for Muscle Dysmorphia, which fails to clearly distinguish between what is normal and what is not when it comes to bodybuilding. The media has sensationalized this disorder, and portrayed a stereotyped, over-generalized view of what Muscle Dysmorphia is and the individuals who are affected by it. I believe this is due to the general public being uniformed, and there is a need for someone who is informed to explore this topic in depth in order to avoid over-diagnosis. I will explore the mindset of normal athletes - i.e. those who enjoy building muscle, highlight the flaws with the current diagnostic criteria, and suggest necessary future research.

What is Muscle Dysmorphia

An individual affected by Muscle Dysmorphia is overly concerned with his or her degree of muscularity, whereby there is a pervasive belief that they are insufficiently large and lack adequate muscularity. This preoccupation with muscle building leads to a never-ending quest to become bigger and more muscular. Manifestations of the disorder include excessive weight lifting, excessive attention to diet and social impairment [2]. The individual may compulsively spend endless hours in the gym, countless amounts of money on supplements, have deviant eating patterns, and are at risk of substance abuse. Muscle dysmorphia is believed to be caused by an interaction of biological, psychological, and social factors. Genetics seems to play a role, whereby some are more liable to experiencing Muscle Dysmorphia than others. It also appears that men with low self-esteem are at a higher risk. Typically, this disorder is seen in male bodybuilders[1], but it can also be seen in females. Muscle Dysmorphia usually first presents in adolescence and develops into adulthood [3]. There is a growing body of evidence suggesting that the prevalence of male body dissatisfaction and muscle dysmorphia is rising. Many do not seek treatment, and their external healthy appearance means they often go unrecognized and untreated. Recent statistics claim that 45 percent of men are believed to suffer from muscle dysmorphia at one point in their lives [93]. Although many people are familiar with the concept of Muscle Dysmorphia, it is most often viewed as a creation of the popular media and rarely observed in daily practice [95]. To date there is little published evidence on the efficacy of treatments for muscle dysmorphia, except for a recent published article which states that a 15year old was successfully treated into remission with eating disorder-focused, family-based treatment [4]. Encouraging talking about inner feelings and dispelling feelings of isolation are good first steps, and discussing the social aspects of the disorder with the person can also be useful

Diagnostic Criteria(several have been proposed)

1. The individual is obsessed with the belief that his or her body should be more lean and muscular. A significant amount of time devoted to weight lifting and fixation on one's diet is common.

2. At least 2 of the following 4 criteria should be met:

a. The uncontrollable focus on pursuing the usual training regimen causes the person to miss out on career, social, and other activities.

b. Circumstances involving body exposure are preferably avoided; if avoidance is not possible, significant unease and worry occur.

c. Performance in the work and social arenas is affected by the presumed body deficiencies.

d. The potentially detrimental effects of the training regimen fail to discourage the individual from pursuing hazardous practices.

3. Unlike anorexia nervosa, in which the person is concerned about being overweight, or other types of body dysmorphic disorder in which the concern is with other physical aspects, the individual with muscle dysmorphia believes that his or her body is insufficiently small or muscular (Leone)

a. a preoccupation with level of muscularity and a strong desire to increase musculature;

b. excessive weight lifting, even while injured;

c. extreme dieting, plus the addition of dietary supplements and drugs such as anabolic/androgenic steroids to increase lean muscle mass; and

d. strained or non-existent personal relationships due to limited time to engage in social functioning [3] [5]

Pre-occupation with the idea that one's body is not sufficiently lean and muscular.

Characteristic associated behaviours include long hours of lifting weights and excessive attention to diet.

The pre-occupation is manifested by at least two of the following four criteria:

1. (1) The individual frequently gives up important social, occupational or recreational activities because of a compulsive need to maintain his or her workout and diet schedule.

2. (2) The individual avoids situations where his or her body is exposed to others, or endures such situations only with marked distress or intense anxiety.

3. (3) The pre-occupation about the inadequacy of body size or musculature causes clinically significant distress or impairment in social, occupational or other important areas of functioning.

4. (4) The individual continues to work out, diet or use performance-enhancing substances despite knowledge of adverse physical or psychological consequences.

The primary focus of the pre-occupation and behaviours is on being small or inadequately muscular, as distinguished from fear of being fat as in anorexia nervosa, or a primary pre-

occupation only with other aspects of appearance as in other forms of body dysmorphic disorder.

■ [5]

Other reported behaviour includes: constant mirror-checking, primacy whereby one may miss social events or cancel plans in order to exercise.

Aetiology

As an emphasis on a lean, muscular male body has increased in Westernized cultures, men have become increasingly dissatisfied with their bodies. Although a comprehensive etiological model has yet to be tested, a number of researchers have demonstrated relationships between many of the proposed variables and Muscle Dysmorphic symptomatology. The risk factors cannot be isolated, as alone they are not predictors of Muscle Dysmorphia; there is a complex interplay and reciprocal relationship of the risk factors.

Biological Variable:

Body Mass Index (BMI): BMI provides an estimate of an individual's body fat based on height and weight [i.e., weight in kg/(height in m)². It is an estimate of body fat, as it doesn't account for bone density, muscularity, and water weight (among other variables). a) scores of 18.4 or below indicate that a person is underweight, b) scores from 18.5 to 24.9 indicate that a person is of normal weight, c) scores from 25 to 29.9 indicate that a person is overweight, and d) scores from 30.0 and above indicate that a person is obese. Men with clinical MD are exceptionally muscular and typically have an unusually high BMI (i.e., in the overweight or obese category), even though they do not have excessive body fat. High body mass coupled with low body fat often serves as a diagnostic criterion for the disorder [7]. Low BMI has been linked with increased strategies aimed at building muscle, including steroid use and overeating to gain weight [10]. Conversely, high BMI has been associated with behaviours aimed at weight loss [e.g., severe dieting, calorie restriction].

Socio-environmental Factors:

Media Pressure/Ideal Body Internalization: As society's emphasis on the hypermesomorphic ideal has increased, men have become more dissatisfied with their bodies in general. Men and women are continually exposed to unrealistic cultural ideals of attractiveness through media outlets such as magazines, television, and advertisement [12] [13] [14], which are responsible for dictating and communicating cultural ideals of attractiveness to society [15]. Many men report a drive to increase their muscularity [16] [15] [8] [9], and in accordance to theories of media influence, when an individual perceives pressure from the media to achieve the unrealistic ideal, it is likely that they will internalize this ideal and engage in behaviours aimed at achieving it [17]. However, Media pressure/ideal internalization are not primary risk factors, as if they were the prevalence rates of Muscle Dysmorphia would be much higher [18].

Participation in Sports that Emphasize Muscularity: Researchers and theorists have suggested that male athletes who participate in sports that emphasize appearance,

leanness, and muscularity may experience higher rates of Muscle Dysmorphic symptomatology than men who do not participate in such sports [19] [20] [21] [22]. Sports such as bodybuilding, weightlifting, lacrosse, soccer, and football tend to reward high muscle mass [19] [23] [24] [25]. However, for some men, participation in such sports has no effect on body image and could actually serve a protective function, particularly for other psychological disturbances such as depression, which is linked to Muscle Dysmorphia.

Psychological and Emotional Factors:

Negative Affect: a number of researchers have observed an association between negative affect (e.g., depression, anxiety) and symptoms of Muscle Dysmorphia (e.g., body dissatisfaction, harmful muscle-building behaviours). Depression is closely related to Muscle Dysmorphic symptomatology [7] and researchers have also found that it is predictive of symptoms of Muscle Dysmorphia [26]. Men who have been diagnosed with mood disorders also report higher rates of harmful muscle-building behaviours, depressive symptomatology and even steroid abuse [27]. Anxiety is a predictor of body dissatisfaction for adolescent boys [28]; male body builders with Muscle Dysmorphic symptomatology report increased symptoms of anxiety when compared to bodybuilders without symptoms of MD [29]. Additionally, Men with full-blown MD have higher rates of co-morbid anxiety disorders than men who do not have MD [42].

Body Dissatisfaction: This is defined as an overall negative appraisal of one's physique [30], and/or a perceived discrepancy between one's actual body size and that which one views as ideal. Half the men who claimed to be dissatisfied with their bodies reported a desire to lose body mass, whilst the other half desired a larger body mass (e.g., increased muscularity) [31]. Body dissatisfaction may mediate the influence of perfectionism, self-esteem, negative affect, media pressure, and ideal body internalization on MD symptomatology.

Low Self-Esteem: Self-esteem is defined as the way a man feels about himself, which is closely tied to the way he feels about his body; men who perceive that they are small or deficient in muscularity may feel inadequate and lacking in self-worth. Researchers suggest that feelings of low self-worth may contribute to a drive for muscularity [32]. Low self-esteem has also been observed in psychiatric inpatients who have been diagnosed with both binge eating disorder (BED) and co-morbid mood and/or anxiety disorders [33].

Body Distortion: This is the discrepancy between one's actual appearance (e.g., musculature, BMI) and one's perception of their appearance. In general, men with clinical Muscle Dysmorphia experience a distorted body image whereby they underestimate their body mass and perceive themselves as small and inadequately muscular, despite in reality being extremely muscular with unusually high BMI [3].

Perfectionism: Perfectionists may be more inclined to engage in extreme, even unhealthy behaviours to achieve their goals [34], and is closely linked to both binge eating and extreme weight loss behaviours in adolescent boys (e.g. food restriction, laxative use) [35]. High rates of perfectionism have been observed in men who report rigid adherence to workout regimens and guilt about non-exercise [36]. Self-oriented perfectionism is the intrinsic drive for perfection, whereby individuals set high standards for themselves and behave in rigid, often extreme ways to achieve those standards. Socially prescribed perfectionism, on the other hand, is when an individual perceives that others (e.g. friends, family, and society) hold unrealistically high expectations for them, and believe that they must meet others' expectations of perfection in order to obtain approval and feel worthy [37]

[20]

History of Childhood Trauma [38] [39] may be another important etiological variable.

[40]

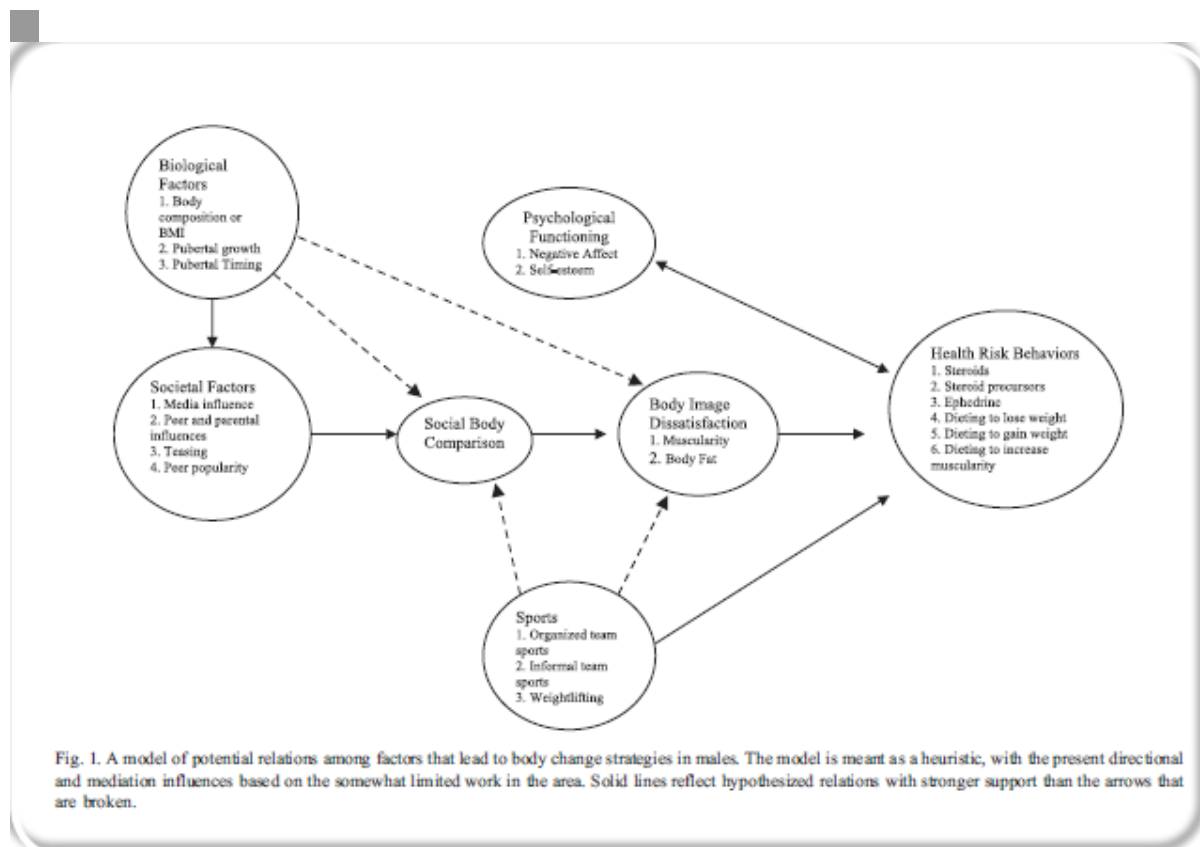


Fig. 1. A model of potential relations among factors that lead to body change strategies in males. The model is meant as a heuristic, with the present directional and mediation influences based on the somewhat limited work in the area. Solid lines reflect hypothesized relations with stronger support than the arrows that are broken.

[41]. A model of potential relations among factors that lead to body change strategies in males. The model is meant as a heuristic, with directional and mediation influences. Solid lines reflect hypothesized relations with stronger support than the arrows that are broken.

Psychological Impact

Men with muscle dysmorphia have an intense body dissatisfaction and frequently describe shame, embarrassment, and impairment of social and occupational functioning in association with their condition [42]. The disorder is associated with great psychopathology, whereby almost everyone with Muscle Dysmorphia suffers from depression, and it has even been reported that those with Muscle Dysmorphia were more likely to have attempted suicide [43]. There are also psychological consequences that can result from deleterious dieting strategies [41]. There is also an accompanying morbid fear of weight and muscle loss, whereby associated compulsive weight training, avoidance behaviour, forced eating, depressed mood and disturbed body image can have detrimental effects on one's quality of life [44]. Socially, the preoccupation with perceived smallness can interfere with school and career accomplishments, as well as friendships and relationships.

Anabolic Androgenic Steroids Abuse

The drive for muscularity may be associated with an increased risk of anabolic-androgenic steroids [45]. Anabolic-androgenic steroids are Class C synthetic drugs derived from testosterone. These drugs are regularly self-administered by body builders and power lifters to enhance their sportive performance [46]. It should be noted that they are also used by other athletes in other sports. Further to its anabolic appeal, steroids allow the user to increase both the frequency and intensity of workouts, in addition to increasing muscle capacity, reducing body fat, increasing strength and endurance, and hastening recovery from injury. There is a wealth of epidemiological data to show that the use of Anabolic-androgenic steroids is increasing: In 2002, the British Medical Association, classified steroid misuse as a public health risk[47], and reported that half of the members of bodybuilding gyms admitted to taking anabolic agents, with 13% in some high-street fitness centres. It was also reported that a third of all general practitioners were treating patients who took steroids, and that needle-exchange programmes for heroin addicts had increasing numbers of steroid users among their clients. The Crimes Reduction Initiatives, a drug and alcohol charity, runs 21 needle exchanges in England and in 2010 it saw 290 people who were using steroids; by 2013 that number had increased to 2,161, a rise of 645% [48].

In females the circulating levels of testosterone are typically about 10% of those observed in males. Thus, many female athletes turn to steroids due to the limits of the normal physiological levels of testosterone. Despite its 'anabolic' (tissue-building) properties, steroids have 'androgenic' (masculinising) properties. Misuse is thus no longer limited to a predominately male population, as females are becoming increasingly involved in using anabolic steroids. Additionally, women who excessively exercise are at risk of Female Athlete Triad syndrome, whereby there is disordered eating, oligo/amenorrhoea and osteopenia/osteoporosis.

Side Effects of Use

The most common side-effects are less serious, mostly cosmetic and usually reversible with cessation: the majority (88–96%) of anabolic steroid users experience at least one side-effect, including acne (40–54%), testicular atrophy (40–51%), gynaecomastia (10–34%), cutaneous striae (34%) and injection-site pain (36%)[49]

Steroid use can have an adverse effect on psyche and behaviour. During steroid use, individuals were more likely to score higher on paranoia, schizoid, antisocial, borderline, histrionic, narcissistic and passive aggressive personality profiles. Studies have suggested that antisocial personality disorder is slightly more likely among anabolic steroid users than non-users. Steroid users have been shown to have a higher prevalence of cluster B (histrionic, narcissistic, antisocial and borderline) personality traits than controls [50]. Case reports describe both hypomania and mania, along with subclinical irritability, elation, recklessness, racing thoughts and feelings of power and invincibility. Of 53 bodybuilders who used anabolic steroids, 27 (51%) reported unspecified mood disturbance [52].

Abuse

Substance abuse refers to a maladaptive pattern of substance use leading to clinically significant impairment or distress. The DSM-IV Criteria for Substance Abuse is:

Abuse

(1 or more in a 12-month period)

Recurrent use resulting in failure to fulfil major role obligation at work, home or school

Recurrent use in physically hazardous situations

Recurrent substance related legal problems

Continued use despite persistent or recurrent social or interpersonal problems caused or exacerbated by substance

[53]

Abuse of anabolic steroids is associated with far more symptoms. Anabolic steroids have been associated with a range of psychiatric symptoms, although it is unclear whether there is a causal link. Misusers of anabolic steroids report significantly more fights, verbal aggression and violence towards their significant others during periods of use compared with periods of non-use [54]. Adolescents who abuse anabolic steroids have nearly triple the incidence of violent behaviour [55]. Episodes of steroid-associated manic or hypomania have also been reported. In one study, of 41 individuals who used anabolic steroids, 5 (12.2%) had psychotic symptoms and 4 (10%) had sub-threshold psychotic symptoms while taking steroids, whereby none had these symptoms when not taking them. Clinical presentations include grandiose and paranoid delusional states that often occur in the context of a psychotic or manic episode. Symptoms usually resolve in a few weeks if steroid use is discontinued. There is, however, a risk that these symptoms can persist for a month despite treatment with antipsychotics [56]. Abuse of anabolic androgenic steroids (AAS) has been linked to a variety of different cardiovascular side effects. Acute myocardial infarction is the most common event presented, but other adverse cardiovascular effects include left ventricular hypertrophy, reduced left ventricular function, arterial thrombosis, pulmonary embolism and several cases of sudden cardiac death [57]. It can also lead to diseases of the hepatic, reproductive and dermatological system.

Dependence

There is evidence to support that steroid dependence does occur, whereby there are a cluster of physiological, behavioural, and cognitive phenomena [58]. The ICD-10 criteria of

Steroid Dependence include experience of at least three of the following during the past year:

- a strong desire to take steroids
- difficulty in controlling use
- withdrawal syndrome when use is reduced
- evidence of tolerance
- neglect of other interests and persistent use despite harmful consequences [59]

Reports of physical dependence on anabolic steroids first appeared in the 1980s, whereby young male weightlifters reported an inability to stop taking them. Withdrawal symptoms were prominent in these descriptions. In a study of 49 male weightlifters, 41 (84%) reported withdrawal effects, with the most frequently described symptom being craving for more steroids. Those who reported being dependent on anabolic steroids generally took higher doses, completed more cycles, and reported more aggressive symptoms than those who did not report dependence. Symptoms of steroid withdrawal include mood disorders, apathy, feelings of anxiety, difficulty in concentrating, insomnia, anorexia, decreased libido, fatigue, headache, and muscle and joint pain [60]. Cessation of steroid use can lead to a loss of muscle mass, strength, performance and confidence after which can have a powerful negative effect on mood, and which may also lead to a strong desire to take steroids again. It is unknown which mechanism is responsible for the development of a dependence syndrome, but it may include endogenous opioids or monoamine systems in the brain, or social reinforcement of a muscular physical appearance. It has been suggested that anabolic steroid use may trigger misuse of other drugs, including opioids. Of 223 men that were admitted to a substance misuse treatment unit primarily for treatment of alcohol, cocaine and opioid dependence, 29 (13%) reported prior anabolic steroid use. 18 of these men reported that anabolic steroids were the first drugs that they had ever self-administered by injection, and 7 men with opioid dependence reported that they first learned about opioids from friends at the gym, and obtained opioids from the same person who had sold them anabolic steroids [61]. It is important to note that most users of steroids do not view themselves as drug misusers; they often view use of steroids as positive step towards improving themselves physically. It is rare for users of anabolic steroids to present to medical services with a primary complaint of steroid use. Interestingly, most users have very little trust in doctors' knowledge of anabolic steroids, and often do not disclose their steroid use in consultations. In one study, 40% of users trusted information on anabolic steroids from their drug dealers as much as information from any physician, and 56% had never revealed their steroid use to a doctor [62].

Categories

There is ongoing debate regarding whether Muscle Dysmorphia should be conceptualized as body dysmorphic disorder, an eating disorder, or obsessive-compulsive disorder. [1]

Body Dysmorphia

Body dysmorphic disorder (BDD) is an anxiety disorder related to body image [63].

The **diagnostic criteria** in DSM-IV includes

1 Preoccupation with an imagined defect in appearance. If a slight physical anomaly is present, the person's concern is markedly excessive.

2 The preoccupation causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

3 The preoccupation is not better accounted for by another mental disorder (e.g. dissatisfaction with body shape and size in anorexia nervosa)

Phillips (1996) suggests that to justify a diagnosis of Body Dysmorphia, preoccupation with 'imagined' defects in appearance should last at least 1 hour a day.

Unlike normal concerns about appearance, in Body Dysmorphia the preoccupation with appearance is excessively time consuming and associated with significant distress or impairment in social, occupational, or other areas of functioning [64]. The causes of Body Dysmorphia are unclear, but certain biological and environmental factors may contribute to its development, including genetic predisposition, neurobiological factors such as malfunctioning of serotonin in the brain, personality traits, and life experiences. Factors that influence Muscle Dysmorphia may also influence Body Dysmorphia, and include self-oriented perfectionism, socially prescribed perfectionism, mood intolerance, and low self-esteem [65]. It is estimated that up to 1% of the UK population have Body Dysmorphia, although this number may be an underestimate as people with Body Dysmorphia often hide it from others. It affects more females than males. Body Dysmorphia can affect all age groups, but usually starts in adolescence, when people are most sensitive about their appearance [66]. People with the disorder are often unemployed or disadvantaged at work, housebound or socially isolated because of their handicap. Up to 80% of people with Body Dysmorphia think about or try to commit suicide [67] and 'do-it-yourself' cosmetic surgery. Patients with Body Dysmorphia often have poor insight and frequently seek plastic surgery consultation over psychiatric consultation [68]. There is frequent comorbidity, with secondary diagnoses of depression, social phobia, obsessive-compulsive disorder or personality disorder. NICE guidelines for treatment include CBT, medication (antidepressants, neuroleptics), and specialist support.

The relationship of muscle dysmorphia to other forms of Body Dysmorphia is unclear; one study showed that 5 of 15 bodybuilders with muscle dysmorphia also displayed other more classic Body Dysmorphic symptoms, suggesting that in some individuals, preoccupation with muscularity may be one of several concurrent body-image preoccupations. Another study [42] found marked comorbidity of muscle dysmorphia with other psychiatric disorders, but failed to enquire specifically about Body Dysmorphic symptoms. One report [5] found that 9.3% of 193 subjects with Body Dysmorphia also had apparent muscle dysmorphia. It has been advised that clinicians should inquire about muscle dysmorphia when evaluating men presenting with Body Dysmorphia.[43]

Eating Disorders

Eating disorders involve serious disturbances in eating behaviour, such as extreme and unhealthy reduction of food intake or severe overeating, as well as feelings of distress or extreme concern about body shape or weight. The four most common eating disorders are Anorexia Nervosa, Bulimia Nervosa, Binge Eating Disorder, and Feeding or Eating Disorders Not Elsewhere Classified.

Diagnostic Criteria, ICD 10

Anorexia Nervosa F50.0	Bulimia Nervosa F50.2
<p>A. Weight loss, or in children a lack of weight gain, leading to a body weight of at least 15% below the normal or expected weight for age and height.</p> <p>B. The weight loss is self-induced by avoidance of "fattening foods".</p> <p>C. A self-perception of being too fat, with an intrusive dread of fatness, which leads to a self-imposed low weight threshold.</p> <p>D. A widespread endocrine disorder involving the hypothalamic-pituitary-gonadal axis, manifest in the female as amenorrhoea, and in the male as a loss of sexual interest and potency.</p>	<p>A. Recurrent episodes of overeating (at least two times per week over a period of three months) in which large amounts of food are consumed in short periods of time.</p> <p>B. Persistent preoccupation with eating and a strong desire or a sense of compulsion to eat (craving).</p> <p>C. The patient attempts to counteract the fattening effects of food by one or more of the following:</p> <ol style="list-style-type: none"> 1. (1) self-induced vomiting; 2. (2) self-induced purging; 3. (3) alternating periods of starvation; 4. (4) Use of drugs such as appetite suppressants, thyroid preparations, diuretics. <p>D. A self-perception of being too fat, with an intrusive dread of fatness</p>

DSM-5 define binge eating disorder as recurring episodes of eating significantly more food, in a short period of time, than most people would eat under similar circumstances, with episodes marked by feelings of lack of control. They may eat too quickly, even when he or she is not hungry, and is usually followed by feelings of guilt, embarrassment, or disgust[69]

There are multiple contributing factors which include: Biological factors (50-80% determined by genetics), Social factors (unrealistic pressures to obtain the "perfect" body; the constant influx of images of perfection; and narrow definitions of beauty), Psychological factors (co-morbidities: depression, anxiety, Obsessive-Compulsive Disorder, low self-esteem; and

feelings of lack of control), and Interpersonal factors (history of abuse; bullying; traumatic life event(s); and difficulty expressing feelings and emotions). [70]

In Muscle Dysmorphia, in addition to the desire for greater muscularity, there is also a concern to not to gain fat [71]. Originally termed 'reverse anorexia', there is research to suggest a strong conceptual similarity with anorexia nervosa. Muscle Dysmorphia is associated with high levels of anxiety and/or depression, low self-esteem and feelings of shame and guilt. Higher rates of depression have been associated with higher rates of eating disorders [72]; Men with muscle dysmorphia and anorexia nervosa demonstrated widespread symptomatic similarities including disturbed body image, disordered eating, and exercise behaviour, whilst differences were consistent with the opposing physiques pursued in each condition [73]. There has also been suggestions of a central eating component [74]; Muscle dysmorphia may present inclusive of episodes of binge eating and purging in addition to compulsive exercise, which may serve an emotional regulation function [75]. It has been argued that the aetiology of MD is much like that of eating disorders [76] [77] and it is hypothesized that the same relationship can be seen in those with muscle dysmorphia. Many feel that muscle dysmorphia should be reanalysed through the lens of an eating disorder spectrum [78].

Obsessive Compulsive Disorder

Obsessive-Compulsive Disorder is an anxiety disorder characterized by recurrent, persistent obsessions or compulsions. Obsessions are the intrusive ideas, images or impulses that are experienced as senseless or repugnant, and difficult to resist. Compulsions are repetitive, stereotyped, seemingly purposeful behaviour which the individual generally recognizes as senseless and from which the individual does not derive pleasure although it may provide a release from tension [79]. Despite recognizing that the behaviour is ineffectual and making attempts to resist it, they are unsuccessful.

Diagnostic Criteria:

1. Obsessional symptoms or compulsive acts or both must be present on most days for at least 2 successive weeks and be a source of distress or interference with activities. Either [obsessions](#) or [compulsions](#) (or both) are present on most days for a period of at least 2 weeks.

2. Obsessional symptoms should have the following characteristics:

- a. Recognized as the individual's own thoughts or impulses.

-originating in the mind of the patient (not imposed by outside persons or influences)

-repetitive and unpleasant

-acknowledged as excessive or unreasonable.

- a. there must be at least one thought or act that is still resisted unsuccessfully, even though others may be present which the sufferer no longer resists.
- b. the thought of carrying out the act must not in itself be pleasurable (simple relief of tension or anxiety is not regarded as pleasure).
- c. the thoughts, images, or impulses must be unpleasantly repetitive.

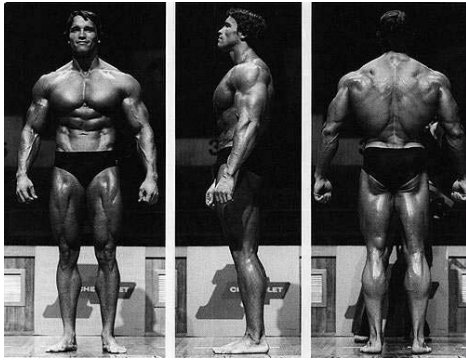
The obsessions or compulsions cause distress or interfere with the patient's social or individual functioning, usually by wasting time.

Negative affect, depression and anxiety directly influences the development of Muscle Dysmorphia by providing the motivation to change behaviours and/or appearance [80]. Anxiety and obsessive compulsive disorder symptoms are highly associated with social physique anxiety and Muscle Dysmorphic symptomology. Anxiety-related symptoms accounts for 77% of the variance in Muscle Dysmorphic symptoms, whilst symptoms of obsessive-compulsive disorder and hostility predicted symptoms of Muscle Dysmorphia and were better predictors of Muscle Dysmorphia than somatoform symptoms. [81] Based on the evidence of an overlapping psychopathology — namely intrusive, obsessional fears and compulsive rituals, some academics have suggested that body dysmorphic disorder might be more appropriately conceptualized as an obsessive- compulsive spectrum disorder

Mindset of the normal Muscle-builder

As the prime motivation of muscle-building is to become bigger and leaner, it is important to distinguish between a healthy enthusiasm for muscle-building and muscle dysmorphia, given that they share the same underlying rationale. Often the term 'bodybuilder' is accompanied with a mental image of the large hulk-like physiques, but for my argument I am referring to anyone who goes to the gym with the incentive to gain muscle. For this sake, I will use the term muscle-builder. For these, the ultimate goal is always more muscle mass with less body fat, which requires consistency with training and diet [84]. Muscle builders form habits over time, and these become integrated into one's lifestyle [85]. The routine is monotonous and rigid, and requires discipline and sacrifice. The habits required are a deviation from the norm, and to many may seem strange and obsessive- for example weighing out food- but for muscle-builders these are necessary step towards their goals. A significant amount of thought, time and energy is placed on the process of building muscle and this means working hard at the gym to progressively overload the muscles and planning meals ahead, particularly calculating the macronutrients and calories and meal timing. Whilst people of the general public may purchase food on their lunch hour and choose according convenience and taste, muscle-builders usually have their pre-prepared meals in tupperware, whereby they eat to support their goals as opposed to enjoying the meals. Muscle-builders often undergo cycles of 'bulking' and 'cutting'; to build muscle and reach a calorie surplus (bulk), some may need to force themselves to eat, blend food, or have protein shakes; to lose fat and achieve a calorie deficit (cut), extreme dieting tactics may be employed when losing fat becomes a priority, and this means limiting carbohydrates, hours of cardiovascular exercise, and sometimes the use of fat-burners. It is an extreme and intense lifestyle that isn't suited for many, but nonetheless there is an entire industry catered for people who have this lifestyle and enjoy it. Many muscle-builders share a common mindset, and that is that the physique can always be improved; there is no such thing as 'perfect' and thus working towards the 'perfect aesthetic body' is a never-ending quest. However, it would be closed minded to think anyone who shares the passion to build muscle has muscle dysmorphia.

It is no coincidence that there is a reported increased prevalence of Muscle Dysmorphia at a time where muscle - even on women- is becoming more accepted and sought after, and this is largely due to the rise in awareness of bodybuilding as a sport, acceptance of the use of supplements, impact of social media, and availability of steroids. Over the past 40 years the muscularity of athletes have dramatically increased, which is shown in the 2 pictures below.



Arnold Schwarzenegger: Mr Olympia: 1970-1975



Phil Heath: Mr Olympia: 2011-2013

Additionally, in 2010 and in 2011 new categories were added to the bodybuilding competition in order to appeal to the mass market and general public termed 'Bikini' and "Men's Physique", respectively.



The concept of building muscle has become more accepted as it is no longer something seen as solely to do with mass and 'freakish-size'. The practices of weight-training and dieting, so central to the bodybuilding ethos, has clearly been adopted by mainstream society. Over time, male models are displaying increased muscularity, resembling 'action-figure' type physiques. In 2010, content of more than 1500 media images from magazines targeted toward gay men were analysed and found that from 1967 to 2008, the bodies of male models in these magazines became significantly leaner and more muscular [86]. Moreover, the male body has been increasingly objectified in the media (i.e. male body parts versus whole bodies), as evident in magazines such as Sports Illustrated [87]. It is predictable that this has increased in recent years and will continue to increase. It has been proposed that the quest for a hypermasculine physique is secondary to insecure gender identity, whereby gender roles have changed as women outperform males in education and in the workplace, challenging the traditional status of male. [97] There have been studies to suggest that media images, even in a brief presentation, can affect men's views of their bodies [88]. Men and women have been facing increasing pressure from the media to attain a lean, muscular physique, and are at risk for body dissatisfaction, disturbed eating and exercise behaviours, and abuse of appearance- and performance-enhancing drugs [89]. In recent years the recreational use of these drugs has increased significantly, usually for the cosmetic purpose of enhancing appearance [90]. There is an limitation to the amount of muscle the body can build- particularly in a short amount of time- without supra physiological

levels of certain hormones, which is breeding the use of androgenic anabolic steroids in the general population. We live in a world of instant gratification which breeds impatience, and many are after the 'quick fix'. The use and misuse of anabolic steroids is no longer the sole domain of elite professional athletes and is thus not a pathognomic diagnostic feature of muscle dysmorphia.

Media portrayal and stereotype

The media has sensationalized the notion of there being a 'bigorexia'. However, there is such limited understanding of this disorder that it is ludicrous to think that the media can be responsible to portray this message accurately to their readers and audience. They have created a vague and largely generalized image as to what people with muscle dysmorphia are like. With mental health, there is no image that can be used to realistically and accurately portray the disease; you cannot state that a person has bipolar disorder or schizophrenia just by looking at them. The media has attached a physical appearance to a mental health disease, using images of bodybuilders to represent Muscle Dysmorphia, which has resulted in a negative stereotype towards bodybuilders. In an TV interview with a clinical psychologist about Muscle Dysmorphia, comments about this disorder included: *"[they] set their alarm in middle of night to have a protein shake... usually the grunters at the gym... they all congregate together and egg each other on"*. This is a gross over-generalization that is offensive to anyone who lives a similar lifestyle, and may share the same appearance to those with Muscle Dysmorphia. Within society, those that prioritize muscle-building are derogatorily termed 'meat-heads'. In March 2014 a lady was accused of intimidating others at Planet Fitness in America, a lighthearted gym which promotes non-judgement and forbids heavy weights, certain exercises or grunting, because she looked "too fit", and was asked to leave. In the UK, a female bodybuilding competitor was told by a nurse that her BMI showed her to be borderline obese and needed to lose weight. These examples reinforce that muscle-building is a deviation from the societal standard of what is normal. I believe in rightly putting a diagnostic label on a behaviour that fits the criteria of a mental health disorder in order to aid and direct research and learning, and to enable healthcare professionals to improve their quality of life by following a management plan in accordance to evidence based medicine. I do not agree with placing a label on behaviour that is deviant from what society believes is normal. Muscle Dysmorphia is something that obviously exists; it is not normal to have pervasive obsessive ideas about having inadequate muscle that are so distressing it makes a person not want to leave their house. Saying that, I believe the term Muscle Dysmorphia is being used very loosely, and when used loosely it discriminates against an entire population of muscle builders who are concerned with building muscle, continuously strive towards getting bigger and better, and who do adopt lifestyles that require dietary discipline and social sacrifice. Without meaning to sound too reminiscent of the 1960-1870s Anti-Psychiatry movement, a convenient label should not be given for the sort of thinking and behaviour that society finds unacceptable. [91]

Definitive Diagnostic Criteria

In the absence of definitive diagnostic criteria we are at risk of over-generalization and over diagnosis. It is crucial to distinguish the line between those men for whom muscle- building is used as a tool for self-improvement from men for whom it has become a manifestation of a pathological obsession with body image. The current diagnostic criteria is too vague and it doesn't take into account the rigorous lifestyle of a normal muscle-builder. Muscle-builders who display an ordinary level of dedication to their sport do not experience the profound

body image disturbance, subjective distress and impaired functioning reported by individuals that those with muscle dysmorphia do. However, there are aspects of a muscle-builders life that fits the criteria of Muscle Dysmorphia; the line is extremely fine between normal and disordered, particularly because those without disorder have similar lifestyle and physical appearance. We have seen that the prevalence of anabolic steroid use is increasing and being found within the general population. The level of body dissatisfaction, eating attitudes, lifetime prevalence of DSM-IV mood, anxiety and eating disorders needs to be more closely examined [8]. The diagnostic criteria must focus on the way in which Muscle Dysmorphia fits the definition of a Mental Disorder as opposed to behaviour that deviates from societal norm. DSM-IV has defined 'Mental Disorder' as a clinically significant behavioural or psychological syndrome or pattern that is associated with present distress or disability or with a significantly increased risk of suffering death, pain, disability, or a loss of freedom. The disorder must be considered as a manifestation of a behavioural, psychological, or biological dysfunction in the individual. It must not be an expected and culturally sanctioned response to a particular event, or simply deviant/conflicting behaviour, i.e. between the individual and society, unless the deviance or conflict is a symptom of a dysfunction in the individual. [92] Attention must be placed on what makes Muscle Dysmorphia similar to already defined mental health disorders i.e. body dysmorphic disorder, obsessive-compulsive disorder, and eating disorders. This can only occur by exploring the thoughts, compulsions, emotions, distress and ramifications of the disorder. The cognitive, behavioural, socioenvironmental, emotional, and psychological factors that influence its expression must be defined. There is a clear distinction between someone who is insecure about a facial feature and turns to cosmetic surgery and someone who has body dysmorphia, just as there is a clear distinction between someone who has ritualistic habits with someone who has obsessive compulsive disorder, and just as with a teenage girl of normal weight who says she's fat and crash diets compared to someone with anorexia. There is not a clear enough distinction between someone who is a muscle-builder and someone with muscle dysmorphia. Exclusion criteria would also aid in defining the fine line, but it requires dissecting the behaviour of the normal end of the spectrum and finding the ways muscle dysmorphia deviates from it. Note: the normal end will be dedicated muscle-builders, not non-gym-attendees.

Current: vague	Questions raised
preoccupation with level of muscularity and a strong desire to increase musculature	<p>What defines a preoccupation- more specificity required (needs to be quantified)? e.g. time spent thinking it, affect. Is it a preoccupation or an obsession (Is it intrusive and cannot be ignored?). Do they go to the gym to release the release the obsession, or do they go to the gym because they enjoy it and like taking the necessary steps to improve their physique. Is there distress? If so, what are the signs and symptoms of the distress?</p> <p>Most people who muscle-build have a strong desire to increase musculature.</p> <p>Do the individual believe they are not muscular, when in fact they are (delusion) or that they are not muscular enough (could be true, as it is relative to who they compare</p>

	themselves to)
excessive weight lifting, even while injured	Many athletes (not just confined to bodybuilding) train through injuries. Muscle atrophies with disuse so their philosophy of “if i don’t train i will lose muscle” is not actually incorrect.
extreme dieting, plus the addition of dietary supplements and drugs such as anabolic/androgenic steroids to increase lean muscle mass	In order to diet for a competition, bodybuilders need to undertake extreme dieting measures to get into the single digit body fat percentile. AAS use is found in the general population. There has to be a pathological difference.
strained or nonexistent personal relationships due to limited time to engage in social functioning	I agree with non-existent relationships being a consequence of a disorder. However, many who weight-train are not able to live the “normal” lifestyle of going out drinking on weekends, spontaneously going to eat at restaurants etc because of meal planning and meal times. This does not make it a disorder.

Further Research

The disorder must be dissected; there is a need to find the reasons behind the thoughts, ideas and acts associated with this disorder. It is important to identify what makes an individual at risk of developing this disorder. It is the answers that will aid a thorough distinction between normal muscle-building behaviour and that which is disordered. It will also help to clarify where this disease lies in terms of its relationship with other psychiatric disorders. It will also aid clarification whether the disorder is founded primarily on an obsession with exercise or diet. Similarities found between the mentalities of muscle dysmorphic individuals will enable us to understand this under-researched disorder better.

Questions to ask/Areas of research:

<p>Body Image and Perception</p>	<p>Do they believe they have any muscle?</p> <p>Do they believe they are bigger than someone who doesn't exercise?</p> <p>Delusion vs Overvalued idea</p> <p>What do they wear vs what would they ideally like to wear?</p> <p>Do you view yourself as bigger than the average man who doesn't go to the gym?</p> <p>Can they see that they have made any muscle gains?</p> <p>Do they avoid pictures?</p> <p>Do they do anything to make themselves appear bigger (e.g. padded clothing)?</p> <p>Is it to do with aesthetics (definition) or purely mass?</p> <p>How far are they willing to go: Would they consider surgery (i.e. is it the act of the gym or just the size/appearance of muscle), oil/alcohol [98], would you take a tablet that has a high risk of death but also leads to muscle growth (quicker than steroids)</p> <p>Reasons that they weight-lift, and reasons why they compete (if they do)</p>
<p>Thoughts</p>	<p>How often do they think about their muscle?</p> <p>Are the thoughts 1st/2nd/3rd person?</p> <p>What are the consequences of the thoughts?</p> <p>Are their thoughts ever paranoid?</p>
<p>Paranoia</p>	<p>Do they think people talk/laugh at them?</p>
<p>Anabolic-Androgenic Steroid use (and others: growth hormone, insulin)</p>	<p>What is the reason behind taking the drugs? i.e. to get bigger than is achievable naturally, to get big quickly, so they can minimise fat gain when they bulk?</p> <p>Number of steroid cycles.</p> <p>How do you feel when you have completed a cycle and are on a break?/ Do you ever not give yourself a break and just take them continuously?</p> <p>Are they aware of the side effects?</p> <p>Have they experienced side effects?</p> <p>Have they needed to take other medication to combat the side effects/ had surgery (e.g. for gynaecomastia)</p> <p>Other use of recreational drugs</p> <p>Reasons for not consulting a doctor (THIS NEEDS TO BE ADDRESSED; it cannot</p>

	<p>continue like this)</p> <p>Have you ever had skin infections from injecting?</p> <p>Do you have regular blood tests?</p>
Gym	<p>Who do they work out with?</p> <p>How do you feel before and after a gym workout?</p> <p>Is having a muscular body more important than... (e.g. happiness, health).</p> <p>Does a workout take priority over important events e.g. going to a family funeral, birth of child</p> <p>What do you wear to the gym (bare in mind, it is common for muscle-builders to wear hoodies).</p> <p>Does wearing baggy clothes when working out cause them to overheat (i.e. choosing to cover up over logic)</p> <p>Does being strong have anything to do with it? (results suggest that elite-level bodybuilders are significantly more likely to engage in characteristics associated with MD than are elite-level power lifters therefore perhaps not [83])</p>
Obsessive rigidity & stereotyped behaviour: Gym	<p>Do they have rest days from the gym?</p> <p>Do they have to spend a specific amount of time at the gym/ complete a specific number of sets/reps?</p> <p>Consequence of skipped workout</p> <p>Do you workout at the same time each day?</p> <p>If quit work for the gym, why can't you work out before or after work (i.e. what was the reason for quitting).</p> <p>Can they control the compulsion to workout/take drugs or do they feel controlled?</p> <p>Have they ever tried to give up the lifestyle?</p> <p>Have you ever been injured?</p> <p>Do you train when injured?</p> <p>Have you ever been lightheaded?</p>

Obsessive rigidity & stereotyped behaviour: Diet	<p>Consequence of skipped meal</p> <p>Do you eat the exact same time every day?</p> <p>Do you eat the exact same number of calories or grams of macronutrients?</p> <p>How much water do they drink? (too much can be dangerous)</p> <p>Do they drink tap or bottle water? (tap: oestrogen)</p>
OCD traits	<p>Do they have obsessive-compulsive traits in other areas of their lives?</p>
Eating Disordered traits	<p>Do they obsessively weigh, measure themselves, or calculate their bodyfat %?</p> <p>What are their eating attitudes- foods they eat, forbidden foods, frequency of meals, what are their beliefs about food?</p> <p>Do they ever binge/starve themselves?</p> <p>Do you have a cheat meal and if so what do you typically have (e.g. is it high protein)?</p> <p>How do they view fat on their body? (e.g. disgusted by it?)</p>
Overtraining	<p>Persistent muscle soreness, increased susceptibility to infection, injuries, fatigue, irritability, depression, insomnia, decreased appetite, strength decrements.</p>
Work, Finance	<p>Have you quit work to workout?</p> <p>Have you ever been in debt because of your quest to build muscle?</p>
Mood, Affect	<p>Depression symptoms: Low mood, anhedonia, fatigue, appetite, sleep, concentration, concentration, hopelessness, guilt, suicidal thoughts/acts. PHQ.</p> <p>Anxiety.</p> <p>Suicide</p> <p>Self harm</p> <p>View of future</p>
Childhood	<p>Were they obsessive/deluded before (about anything)?</p> <p>If not, what was their personality/life like before</p> <p>Did they used to be skinny?</p> <p>Were they ever bullied?</p> <p>Birth</p>

	<p>Milestones</p> <p>Feeding</p> <p>Progress at school</p> <p>Friends at school</p> <p>Hobbies</p> <p>Sports</p> <p>Self harm, suicide</p>
Family	Family History of psychiatric disturbances
Relationships, Social	<p>Have your relationships suffered because of your workouts? Do you have any friends?</p> <p>Do you ever socialize?</p> <p>Do you do anything not related to the gym?</p> <p>Libido.</p>
Management	Do they respond to CBT or medication (particularly SSRIs)? 'Rehab' i.e. forced time away from the gym?
Self Esteem	<p>Response to criticism</p> <p>How do you view yourself as a man/husband/father/son?</p> <p>People describe me as...</p> <p>I describe myself as...</p> <p>How do you feel when you see a man more muscular than you?</p> <p>Eye-contact, body language</p> <p>Have they ever experienced anything that has made them feel emasculated?</p>
Media	<p>Subscription to bodybuilding magazines,</p> <p>Time spent looking at pictures</p> <p>Do they acknowledge that images are photoshopped?</p>
Internalized	<p>What is your idea of the ideal body?</p> <p>What does having a muscular body mean to you (e.g. success, health, happiness)?</p>

Insight	<p>Do they think they have a problem?</p> <p>What do you believe is the secret to obtaining the ideal body you want?</p> <p>Would they be willing to accept help?</p> <p>Would they recognise that they fit the criteria if shown that they fit the diagnostic criteria (partial insight)?</p>
Other people's views	<p>Do the people around them who also go to the gym think their behaviour is normal?</p> <p>What do other people say about your training habits?</p> <p>Do their opinions ever make you angry?</p>

[96]

Conclusion

In conclusion, Muscle Dysmorphia is an under-researched disorder with potentially devastating psychological health ramifications and is associated with the use and abuse of Anabolic Androgenic Steroids. It encompasses behavioural traits found in Body Dysmorphia, Eating disorders and Obsessive-Compulsive Disorder. The current diagnostic criteria fails to distinguish between normal muscle-building behaviour and muscle dysmorphic behaviour, which leads to stereotype and stigma, as well as potential over reporting and over diagnosis. With an apparent growing prevalence, there is a need for further research to aid understanding of this disorder. Research into the mindset and actions of those with muscle dysmorphia is essential, and it requires an insight into the behaviour and life of the normal muscle-builder. The similarities that Muscle Dysmorphia has with other psychiatric disorders must be highlighted and incorporated into more precise diagnostic criteria to highlight Muscle Dysmorphia as a psychiatric disorder and not just a deviation from the societal standard of norm.

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